Scottish Health Technical Memorandum 2024

(Part 1 of 4)

Overview and management responsibilities

Lifts

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Contents

1. Scope

General

1.1 Healthcare premises are dependent upon lifts to provide an efficient, fast and comfortable vertical transportation service for the movement of patients, staff, visitors, medical equipment and ancillary services items.

1.2 All lifts are subject to strict statutory regulations which cover operational safety to ensure that passengers can be fully confident that the lift service is safe to use.

NOTE: Lifts in healthcare premises provide an essential service that may not always be fully appreciated by the users.

1.3 The scope of this Scottish Health Technical Memorandum does not cover manual lifts, hoists, escalators and paternosters. Paternosters are considered too hazardous in a healthcare environment.

User considerations

1.4 The psychological aspects of lift design in terms of being user-friendly need to be addressed to allay anxieties and fears of users.

1.5 Travelling in a lift can be perceived as dangerous by persons of a nervous disposition, in several different ways, but mainly from the notion of being isolated in a sealed box inside a vertical well which extends from the lowest ground floor level to the top floor of the building.

1.6 A common claustrophobic fear is that of being trapped between floors without the means to communicate with persons outside to give warning of the predicament or to receive reassurance that assistance is at hand.

1.7 Physiological constraints affect the rates of acceleration and deceleration which the human body can comfortably withstand and in healthcare premises, the selection of operational lift speed is important to minimise any adverse effects on patients.

1.8 Psychological appreciations are more subtle and can be influenced by the lift finishes, decor, apparent reliability, frequency and transit time of the service.

2. Management responsibilities

2.1 It is incumbent on management to ensure that their lift installations comply with all the statutory regulations applicable to lifts on their premises. Other functional guidance in terms of standards and codes of practice should also be noted.

Statutory requirements

2.2 Safety regulations are as laid down in the:

a. Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968;
b. Health and Safety at Work etc Act 1974;
c. Electricity at Work Regulations 1989;
d. Fire Precautions Act 1971, (as amended by the Fire Safety and Safety of Places of Sport Act 1987),
e. Factories Act 1961 (as amended);
f. The Building Standard (Scotland) Regulations 1990 (as amended);
g. Lifting Operations and Lifting Equipment Regulations 1998;
h. Management of Health and Safety at Work Regulations 1999;
i. Workplace (Health, Safety and Welfare) Regulations 1992;
j. Construction (Design and Management) Regulations 1994;
k. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR);
l. Electromagnetic Compatibility Regulations 1992, (as amended);
m. Supply of Machinery (Safety) Regulations 1992.

Functional guidance

2.3 Guidance is as laid down in:

a. British Standards and Codes of Practice;
b. Health and Safety Executive Guidance;
c. NHS Model Engineering Specifications;
d. Health Building Notes;
e. Scottish Hospital Technical Notes;
f. Scottish Health Technical Memoranda and NHS in Scotland Firecode;

g. Scottish Hospital Planning Notes

h. The Technical Standards for compliance with the Building Standards (Scotland) Regulation 1998.

For further details please refer to the references section.

2.4 The Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968 require that a lift will function without injury or danger to the general public and passengers.

Safety applications

2.5 The Factories Act 1961 and the Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968 require that every power-driven lift should be of good mechanical construction, sound material, adequate strength, properly maintained and thoroughly examined by a competent person (lifts) at least once in a period of six months, and that a report of the result of every such examination should be prepared on the prescribed form F2530 (previously F54) (see Part 4 'Operational management' of this SHTM), signed and dated by the person carrying out the examination.

NOTE: Competent person (lifts) – refer to Chapter 6 'Designated staff functions'.

2.6 The report should be retained and kept readily available for inspection for at least two years after the date of the lift examination.

2.7 The legal responsibility for ensuring that lifts are properly maintained rests with the management of the healthcare premises in which the lifts are installed.

2.8 At present, while there is no legal requirement for new lifts to be tested before being taken into service, it is strongly recommended that all lifts should be examined and tested in accordance with BS 5655: Part 1:1986, by a competent person (lifts). (Reference should also be made to BS EN 81-1)

2.9 Fire regulations require that certain lift controls can be operated by the fire brigade so that firemen can take immediate control of the lift for safety and fire-fighting purposes.

2.10 At least one bed-lift in an acute hospital should be connected to the emergency electrical supply system in line with the guidance contained in SHTM 2011; *Emergency electrical services*.

2.11 All passenger and bed/passenger lifts should be fitted with an emergency intercommunication point.

3. Functional overview

Types of lift

3.1 There are two main types of lift installed in healthcare premises; these are:

a. traction lifts;

b. hydraulic lifts.

Consideration should be given to the running (maintenance) costs incurred over the life span of the lift installation when comparisons are made between traction and hydraulic lifts.

Traction lifts

3.2 Traction lifts are most commonly used in high-rise buildings. They are rope-driven where the drive is by an electric variable speed motor, through a gearbox. This type has a lift car which travels vertically up and down a lift well between the lowest ground floor and the top floor. The lift car's weight is counterweight balanced throughout its full travel in the lift well.

3.3 Magnetic brake systems control the lift car movements between landing levels. In the event of an over travel, the bottom of the lift well is cushioned by a buffer recoil mechanism. The top is protected for the safety of maintenance personnel, by first and second over travel limit switches to give adequate top of car clearance.

3.4 The traction lift is versatile and can be designed to operate at very fast speeds, such as is required in high-rise buildings. Passenger lifts can routinely carry up to 21 passengers (1.6 tonnes) at speeds of 0.5 to 3.5 metres per second (100 to 700 ft/min), depending on travel and duty.

Hydraulic lifts

3.5 Hydraulic lifts are suitable for applications in low-rise buildings usually up to a maximum of four floors. They utilise less plantroom space and, in general, the overall capital cost is lower than the traction lift.

3.6 The hydraulic lift is powered by oil-operated ram(s). For the direct acting type, the rams are located below or to the side of the lift car and for the indirect action type it is usual to have a driving mechanism with a side jack arrangement. The extended vertical length of the ram is physically limited and this in turn limits its suitability to low-rise buildings.

3.7 Hydraulic lifts generally operate at a slower speed in the raise direction than for lowering. Lowering is by gravity, and is speed controlled by restrictors in the hydraulic oil return path from the ram(s) to the hydraulic pump reservoir tank.

Categories of lift

3.8 Lifts are categorised according to their use. In healthcare premises they fall into one of the following categories:

a. **passenger lifts**: intended to carry standing and wheelchair-seated passengers. Typical carrying capacity varies from 600 to 1000 kg;

b. **bed/passenger lifts**: generally constructed to similar standards as passenger lifts but have a car of larger dimensions. This permits the carrying of a passenger (patient) on a bed or trolley together with the necessary staff and equipment. Typical carrying capacity varies from 1660 to 2500 kg;

c. **goods lifts**: typically carry up to 5 tonnes. Goods lifts that are also used to carry passengers should conform in all respects to the regulations governing the use of passenger lifts;

d. **service lifts**: service lifts are not designed to carry passengers. They are arranged to be called and despatched externally, normally by a call point adjacent to each level hatch or access door, and are generally used for small loads.

4. Testing and inspection criteria

4.1 Lifts in healthcare premises are subject to a statutory regime of inspection; these are dealt with more fully in Part 3 ‘Validation and verification' and Part 4 ‘Operational management’ of this SHTM. Management must ensure that their operational procedures include the nomination of individuals to keep lifts in the required safe condition and to arrange for the mandatory inspections to be carried out at the prescribed intervals.

4.2 Every power-driven lift should be thoroughly examined at least once every six months (see paragraph 2.5). Lift examination should be supervised and performed only by an appointed competent person (lifts). It is therefore of the utmost importance that safety requirements are borne in mind at all times and that only approved and regulated procedures are applied.

4.3 Lifts are subject to the Electricity at Work Regulations 1989. Compliance is obtained by ensuring that only authorised personnel have access to electrical equipment and supplies. Electrical wiring and circuits in lift cars must be securely enclosed to prevent unauthorised access. Similarly, lift motor rooms and hydraulic machine rooms should be kept locked and the procedures of SHTM 2020; *Electrical safety code for low voltage systems* strictly applied.

4.4 Healthcare premises are subject to the requirements of the Health and Safety at Work etc Act 1974. The Health and Safety guidance note PM7 recommends that the inspection standards contained in the Factories Act 1961 and the Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968 be applied in other work places which includes healthcare premises. Health and Safety Executive HM Factory Inspectorate Form F2530 (previously F54) has to be completed for any lift installations to which these Acts apply.

4.5 Insurance companies will only provide cover for lifts if the legal inspection requirements have been met. It is customary for their inspectors to carry out the statutory examination of lifts which they insure. It should be noted that insurance inspection reports refer to the condition of the lift at the time of inspection. Local management is responsible for ensuring that a satisfactory standard is maintained.

4.6 The purpose of thorough examination and testing is to ascertain whether the lift installation may continue to remain safely in service.

5. Management summary

5.1 Emergencies involving lifts are totally unpredictable. Management should bear this in mind in terms of an organised and well prepared response.

5.2 An operational plan covering emergency procedures should be in place to ensure that all emergencies are dealt with in a positive and well rehearsed manner.

5.3 Management should ensure that adequately trained staff are available at all times to lower lifts manually and operate door opening in the event of a lift being “stuck” between floors.

5.4 It is incumbent on management to underwrite the financial provisions for the operation and maintenance of lifts. This would include adequate training for personnel to undertake the emergency procedures safely.

5.5 To achieve an acceptably rapid response to emergencies, the following preparation, as listed below, should be considered by management (this list is neither exhaustive nor prioritised):

a. a schedule, made available to the emergency teams, which details the location of all lifts, their identifying references, lift car telephone numbers and their functions in the healthcare premises, including sources of normal and emergency electrical supplies;

b. the lift maintenance contractor’s name and emergency telephone number;

c. ready identification of all competent persons (lifts);

d. the formation of emergency teams;

e. a record of relevant training; received by emergency teams at the healthcare premises;

f. a schedule of envisaged incidents and emergencies requiring abnormal operational procedures should be prepared. This schedule could contain the procedures to be followed by the emergency teams for the safe recovery and counselling of trapped lift passengers.

6. Designated staff functions

6.1 Only trained authorised and competent persons (lifts) should be appointed by management to control the operation and maintenance of lifts.

6.2 **Management**: the owner, occupier, employer, general manager, chief executive or other person who is accountable for the premises and is responsible for issuing or implementing a general policy statement under the Health and Safety at Work etc (HSW) Act 1974.

6.3 **Designated person (electrical)**: an individual who has overall authority and responsibility for the premises containing the electrical supply and distribution system within the premises and has a duty under the HSW Act 1974 to prepare and issue a general policy statement on health and safety at work, including the organisation and arrangements for carrying out that policy. This person should not be the authorising engineer.

6.4 **Designated person (lifts)**: an individual who has been nominated by management to ensure that lift operations are kept to a satisfactory standard including mandatory examinations, record keeping and emergency procedures.

6.5 **Duty holder**: a person on whom the Electricity at Work Regulations 1989 impose a duty in connection with safety.

6.6 **Competent person (lifts)**: a person with adequate training, both theoretical and practical, and with experience of the equipment (lift installation) under examination to enable a true assessment of its continued safe operation to be made and who is supported within an appropriate organisation.

NOTE: This definition of competent person (lift) is synonymous with the definition of authorised person as defined in BS 7255: 1989.

6.7 **Employer**: any person or body who:

a. employs one or more individuals under a contract of employment or apprenticeship;

b. provides training under the schemes to which the Health and Safety (Training for Employment) Regulations 1990 (SI 1380:1990) apply.

6.8 **Authorising engineer (high voltage)**: a chartered electrical engineer with appropriate experience and possessing the necessary degree of independence from local management who is appointed in writing by management to implement, (as appropriate), administer and monitor the safety arrangements for the high voltage electrical supply and distribution systems of that organisation to ensure compliance with the Electricity at

Work Regulations 1989 and to assess the suitability and appointment of candidates in writing to be authorised persons (see SHTM 2021; *Electrical safety code for high voltage systems*).

6.9 **Authorising engineer (low voltage)**: a chartered engineer or incorporated electrical engineer with appropriate experience and possessing the necessary degree of independence from local management who is appointed in writing by management to advise on and monitor the safety arrangements for the low voltage electrical supply and distribution systems of that organisation to ensure compliance with the Electricity at Work Regulations 1989 and to assess the suitability and appointment of candidates in writing to be authorised persons (see SHTM 2020; *Electrical safety code for low voltage systems*).

6.10 **Authorised person (electrical)**: an individual possessing adequate technical knowledge and having received appropriate training, appointed in writing by the authorising engineer to be responsible for the practical implementation and operation of management's safety policy and procedures on defined electrical systems (see SHTM 2021 and SHTM 2020).

6.11 **Competent person (electrical)**: an individual who, in the opinion of an authorised person, has sufficient technical knowledge and experience to prevent danger while carrying out work on defined electrical systems (see SHTM 2021 and SHTM 2020).

7. Definitions

7.1 **Department**: an abbreviation of the generic term “UK Health Departments” (Scottish Executive Health Department).

7.2 **Lift**: an appliance for transporting persons or goods between two or more levels by means of a guided car moving in a substantially vertical direction and travelling in the same path in both upward and downward directions (BS).

7.3 **Traction lift**: a lift whose lifting ropes are driven by friction in the grooves of the driving sheave of the machine (BS).

7.4 **Hydraulic lift**: a lift in which the lifting power is derived from an electrically-driven pump, transmitting hydraulic fluid to a jack, acting directly or indirectly on the car (BS).

7.5 **System**: a system in which all the electrical equipment is, or may be, electrically connected to a common source of electrical energy, including such source and such equipment.

7.6 **Injury**: death or personal injury from electrical or mechanical failures.

7.7 **Danger**: a risk of injury.

7.8 **Essential circuits**: circuits forming part of the essential services electrical supply so arranged that they can be supplied separately from the remainder of the electrical installation.

7.9 **Emergency supply**: any form of electrical supply which is intended to be available in the event of a failure in the normal supply.

7.10 **Essential service electrical supply**: the supply from an engine-driven ac emergency generator which is arranged to come into operation in the event of a failure of the normal supply and provide sufficient electrical energy to ensure that all basic functions of the healthcare premises are maintained in service.

7.11 **Electrical equipment**: includes anything used, intended to be used or installed for use to generate, provide, transmit, transform, conduct, distribute, control, measure or use electrical energy.

7.12 **High voltage (HV)**: the existence of a potential difference (rms value for ac) normally exceeding 1000 volts ac between circuit conductors or 600 volts between circuit conductors and earth.

7.13 **Low voltage (LV)**: the existence of a potential difference (rms value for ac) not exceeding 1000 volts ac or 1500 volts dc between circuit conductors or 600 volts ac or 900 volts dc between circuit conductors and earth.

References

NOTE:
Where there is a requirement to address a listed reference, care should be taken to ensure that all amendments following the date of issue are included.

Publication ID	*Title*	*Publisher*	*Date*	*Notes*
Acts and Regulations				
	The Building (Scotland) Act	HMSO	1959	
	Clean Air Act	HMSO	1993	
	Disabled Persons Act	HMSO	1981	
	Electricity Act	HMSO	1989	
	Factories Act	HMSO	1961	
	Fire Precautions Act	HMSO	1971	
	Fire Safety and Safety of Places of Sport Act	HMSO	1987	
	Health and Safety at Work etc Act	HMSO	1974	
	Registered Establishments (Scotland) Act	HMSO	1998	
	The Water (Scotland) Act	HMSO	1980	
	The Building Standards (Scotland) Regulations: Technical Standards Guidance	HMSO	1998	
SI 2179 & 187	The Building Standards (Scotland) Regulations (as amended)	HMSO	1990	
SI 1460	Chemicals (Hazard Information and Packaging for Supply) Regulations (CHIP2)	HMSO	1997	
SI 3140	Construction (Design and Management) Regulations	HMSO	1994	
SI 437	Control of Substances Hazardous to Health Regulations (COSHH)	HMSO	1999	
SI 635	Electricity at Work Regulations	HMSO	1989	
SI 1057	Electricity Supply Regulations (as amended)	HMSO	1988 (amd 1994)	
SI 2372	Electromagnetic Compatibility Regulations (as amended)	HMSO	1992	
SI 2451	Gas Safety (Installation and Use) Regulations	HMSO	1998	

Publication ID	Title	Publisher	Date	Notes
SI 917	Health & Safety (First Aid) Regulations	HMSO	1981	
SI 682	Health & Safety (Information for Employees) Regulations	HMSO	1989	
SI 2792	Health and Safety (Display Screen Equipment) Regulations	HMSO	1992	
SI 341	Health and Safety (Safety Signs and Signals) Regulations	HMSO	1996	
SI 1380	Health and Safety (Training for Employment) Regulations	HMSO	1990	
SI 2307	Lifting Operations and Lifting Equipment Regulations (LOLER)	HMSO	1998	
SI 3242	Management of Health and Safety at Work Regulations	HMSO	1999	
SI 2793	Manual Handling Operations Regulations	HMSO	1992	
SI 1790	Noise at Work Regulations	HMSO	1989	
SI 849	Office, Shops and Railway Premises (Hoists and Lifts) Regulations	HMSO	1968	
SI 3139	Personal Protective Equipment (EC Directive) Regulations (as amended)	HMSO	1992	
SI 2966	Personal Protective Equipment at Work (PPE) Regulations	HMSO	1992	
SI 2306	Provision and Use of Work Equipment Regulations (PUWER)	HMSO	1998	
SI 3163	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)	HMSO	1995	
SI 3073	The Supply of Machinery (Safety) Regulations	HMSO	1992	
SI 2063	The Supply of Machinery (Safety) (Amendment) Regulations	HMSO	1994	
	The Technical Standards for Compliance with the Building Standards (Scotland) Regulations	HMSO	1998	
SI 3004	Workplace (Health, Safety and Welfare) Regulations	HMSO	1992	

Publication ID	*Title*	*Publisher*	*Date*	*Notes*
British Standards				
BS 4737	**Intruder alarm systems** **Part 1**: Specification for installed systems with local audible and/or remote signalling	BSI Standards	1986	(AMD 5804, 12/87)
BS 5588	**Fire precautions in the design, construction and use of buildings**	BSI Standards		
	Part 5: Code of practice for fire-fighting stairs and lifts		1991	
	Part 8: Code of practice for means of escape for disabled people		1999	
	Part 11: Fire Precautions in design construction and use of buildings		1997	
BS 5655	**Lifts and service lifts**	BSI Standards		
	Part 1: Safety rules for the construction and installation of electric lifts		1986	
	Part 2: Safety rules for the construction and installation of hydraulic lifts		1988	(AMD 6220, 4/89)
	Part 3: Specification for electric service lifts		1989	(AMD 6377, 9/91)
	Part 5: Specification for dimensions of standard lift arrangements		1989	
	Part 6: Code of practice for selection and installation		1990	
	Part 7: Specification for manual control devices, indicators and additional fittings (implementing ISO 4190-5)		1983	(AMD 4912, 9/85)
	Part 8: Specification for eyebolts for lift suspension		1983	
	Part 9: Specification for guide rails		1985	(AMD 5186, 7/86; AMD 5786, 1/88)

Publication ID	Title	Publisher	Date	Notes
	Part 10: Specification for testing and inspection of electric and hydraulic lifts		1986	(AMD 6002, 5/89)
	Part 10.1.1: Lifts and service lifts. Specification for the testing and examination of lifts and service lifts. Electric lifts. Commissioning tests for new lifts		1995	
	Part 10.2.1: Lifts and service lifts. Specification for the testing and examination of lifts and service lifts. Hydraulic lifts. Commissioning tests for new lifts		1995	
	Part 11: Recommendation for the installation of new, and the modernisation of, electric lifts in existing buildings		1989	(AMD 8097, 3/94)
	Part 12: Recommendation for the installation of new, and the modernisation of, hydraulic lifts in existing buildings		1989	(AMD 6762, 9/91; AMD 8098, 3/94)
BS 5810	**Code of practice for access for the disabled to buildings**	BSI Standards	1979	
BS 7255	**Code of practice for safe working on lifts**	BSI Standards	2001	
BS EN 81-1	**Safety rules for the construction and installation of lifts. Electric lifts**	BSI Standards	1998	
BS EN 81-2	**Safety rules for the construction and installation of lifts. Hydraulic lifts**	BSI Standards	1998	
BS EN ISO 9000	**Quality management and quality assurance standards**	BSI Standards		
Scottish Health Technical Guidance				
SHTM 2005	Building management systems	P&EFEx	2001	CD-ROM
SHTM 2007	Electrical services supply and distribution	P&EFEx	2001	CD-ROM
SHTM 2011	Emergency electrical services	P&EFEx	2001	CD-ROM
SHTM 2014	Abatement of electrical interference	P&EFEx	2001	CD-ROM
SHTM 2020	Electrical safety code for low voltage systems (Escode – LV)	P&EFEx	2001	CD-ROM
SHTM 2021	Electrical safety code for high voltage systems (Escode – HV)	P&EFEx	2001	CD-ROM

Publication ID	Title	Publisher	Date	Notes
SHTM 2023	Access and accommodation for engineering services	P&EFEx	2001	CD-ROM
SHTM 2025	Ventilation in healthcare premises	P&EFEx	2001	CD-ROM
SHTM 2045	Acoustics	P&EFEx	2001	CD-ROM
SHPN 1	Health service building in Scotland	HMSO	1991	
SHPN 2	Hospital briefing and operational policy	HMSO	1993	
SHTN 1	Post commissioning documentation for health buildings in Scotland	HMSO	1993	
SHTN 4	General Purposes Estates and Functions Model Safety Permit-to-Work Systems	EEF	1997	
	NHS in Scotland – PROCODE	P&EFEx	2001	Version 1.1
NHS in Scotland Firecode				
SHTM 81	Fire precautions in new hospitals	P&EFEx	1999	CD-ROM
SHTM 82	Alarm and detection systems	P&EFEx	1999	CD-ROM
SHTM 83	Fire safety in healthcare premises: general fire precautions	P&EFEx	1999	CD-ROM
SHTM 84	Fire safety in NHS residential care properties	P&EFEx	1999	CD-ROM
SHTM 85	Fire precautions in existing hospitals	P&EFEx	1999	CD-ROM
SHTM 86	Fire risk assessment in hospitals	P&EFEx	1999	CD-ROM
SHTM 87	Textiles and furniture	P&EFEx	1999	CD-ROM
SFPN 3	Escape bed lifts	P&EFEx	1999	CD-ROM
SFPN 4	Hospital main kitchens	P&EFEx	1999	CD-ROM
SFPN 5	Commercial enterprises on hospital premises	P&EFEx	1999	CD-ROM
SFPN 6	Arson prevention and control in NHS healthcare premises	P&EFEx	1999	CD-ROM
SFPN 7	Fire precautions in patient hotels	P&EFEx	1999	CD-ROM
SFPN 10	Laboratories on hospital premises	P&EFEx	1999	CD-ROM
UK Health Technical Guidance				
EH 40	HSE Occupational Exposure limits	HSE	Annual	
MES	Model Engineering Specifications	NHS Estates	1997	As required
MES C42A	Electric traction lifts	NHS Estates	1993	
MES C42B	(Electrical vol. 1) Hydraulic lifts	NHS Estates	1993	

Publication ID	*Title*	*Publisher*	*Date*	*Notes*
MES C42C	Service lifts	NHS Estates	1993	
HBN 40	Common activity spaces. Volume 4: Circulation areas and Volume 5: Scottish Appendix	HMSO	1995	
Health and Safety Executive publications				
	Health and Safety Executive	HSE	1982	
(PM 7)	Lifts: thorough examination and testing	HSE		
(PM 26)	Safety at lift landings	HSE	1981	
	Lifting Plant and Equipment (Records of Test and Examination etc) Regulations 1992. Record of thorough examination of lifting plant equipment (Form F2530).	HSE		Issued in pads of 10
Miscellaneous References				
	CIBSE Commissioning codes Series A: Air distribution systems. Chartered Institute of Building Services Engineers	CIBSE	1971	
	Series D: Transportation systems in buildings. Chartered Institute of Building Services Engineers	CIBSE	1993	
	National Association of Lift Makers (NALM) Distance Learning Course, Course Reference Books			