

**FIRE PRECAUTIONS
GUIDANCE DOCUMENT**

Legislation		L
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LEGAL FRAMEWORK

The Guidance Document to the Fire Precautions (Sub-Surface Railways Stations) Regulations 1989 shows the details of the regulations (printed in red) together with the Interpretation as applicable to LUL (printed in blue) that have been agreed between LUL and LFCDA.

Other legislation should be viewed with

- The Fire Precautions Act 1971 as amended (HSAW 1974) and Fire Safety and Safety of Places of Sports Act 1987
- The Health and Safety at Work Etc Act 1974
- Health and Safety (Safety Signs and Signals) Regs 1996
- Construction (Design and Management) Regulations (applicable from April 1996).

There are 3 categories of LUL stations

- Sub-Surface stations (sometimes known as Section 12 stations)
- Surface stations requiring certification under the Fire Precautions Acts 1971
- Surface stations **not** requiring certification under the Fire Precautions Acts 1971 (these stations are known as Section 9A stations).

The certification of a Surface station depends on the number of people working there.

Non certifiable premises carry a statutory obligation on the business to make sure

- means of escape are acceptable
- adequate fire fighting equipment is provided
- staff are trained and records kept.

Other legislation of interest include

- **The Railways (Safety Case) Regulations** (govern the operation of railways and requiring operators and infrastructure controllers to state how they manage safety)
- **The Railways (Safety Critical works) Regulations** (govern the competencies of people who undertake safety critical tasks on the railways)
- **The Railways (Approval of Works, Plant and Equipment) Regulations** (regulate the authority to bring safety critical works and equipment into use).

Staff who need further information on the legislative context can refer to the document titled 'Compliance Framework' prepared by the Compliance Engineer. A sample of part of the contents page is shown below.

Legal Framework

This section comprises a brief summary of principal acts and regulations governing LUL Engineering activities. It includes

- Legislation map
- Principal Acts and regulations
- Legal Framework
- Common Law
- Criminal Law
- Case Law
- Making Law
- European and Parliamentary law making.

INTRODUCTION

Purpose of the Guidance Document

This Guidance Document has been produced in order to give advice on how compliance with the Fire Precautions (Sub-surface Railway Stations) Regulations 1989, (hereinafter referred to as the “Regulations”), can be achieved and the compensatory features of design which must be included when exemptions to exemptable Regulations are sought.

It sets fire safety standards that have been agreed between London Underground Ltd (LUL) and the London Fire and Civil Defence Authority (LFCDA), whilst allowing flexible approaches it recognises that these must be permissible by the Regulations.

Part 1 of this document deals with the top 13 stations on the relative risk index contained in the Quantitative Risk Analysis (QRA) report J2684 conducted by Trident Consultants Ltd for London Underground Ltd (LUL). These stations are required to be fully compliant with the Regulations subject to specific exemptions issued by the London Fire and Civil Defence Authority (LFCDA).

Part 2 deals with the remaining stations which achieve compliance by the application of principles agreed between the LFCDA and LUL following consideration and discussion of the QRA report.

Part 3 details the action to be taken by Station Managers and others in the event of failures of items of fire safety equipment.

Part 4 has not yet been completed but will deal with the standards to be applied to new railway station developments.

Copies of the relevant Parts of this Guidance Document are to be kept in the Station Managers office at all stations to which the Regulations apply. Further copies will be kept by the Railways Project Group and in the libraries of Fire Safety offices of the LFCDA.

LUL staff may obtain replacement copies from the Fire Safety Engineer, London Underground Ltd. LFCDA staff are to request replacement copies via the Railways Project Group.

This document is a straight reproduction of a guidance issued by LUL Fire Safety Engineer with agreement from the LFCDA. The Laws printed in red have been reproduced with the permission of the Home Office. The blue printing is LUL’s interpretation of the laws. These have also been agreed with the LFCDA.

The author of this document is the LUL Fire Safety Engineer, under the custodianship of the Underground Rules Team. It does not follow the language and style of other Underground Rules publications in the Reference/Working Manual.

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FOREWORD

This Guidance Document is agreed between London Underground Limited (LUL) and the London Fire and Civil Defence Authority (LFCDA) and is structured so that guidance is given after each section of the Regulations of the Fire Precautions (Sub-surface Railway Station) Regulations 1989 hereinafter called “the Regulations”.

The Regulations are printed verbatim in red and additional clarification or agreed interpretations are given in blue in subsequent paragraphs.

This is not a prescriptive guide, the guidance given being based on previously agreed decisions, however alternative means of achieving compliance may be acceptable. LUL staff should also ensure compliance with any internal rules and other legislation.

If any conflict between this guidance document and other rules or legislation is identified by LUL or LFCDA staff the matter is to be reported immediately to:

LUL Staff: The Fire Safety Engineer, 30 The South Colonnade, Canary Wharf, London E14
Telephone: 0171 308 3920, Fax: 0171 308 2135

LFCDA Staff: Divisional Officer (Existing Stations), Railways Project Group,
Fire Safety Department, Room 315A Queensborough House, 12-18 Albert Embankment, London SE1
Telephone: 0171 587 4885, Fax: 0171 587 4289

Neither the LFCDA nor LUL are bound by the additional clarification or interpretation of the Regulations contained in this guidance document. The interpretation of the Regulations contained in this document may be varied at any time by agreement between the LFCDA and LUL. Any authoritative interpretation of the meaning or application of the Regulations is a matter for the courts.

Sub-surface stations are required to comply with the Regulations subject to any applicable Exemption Notice(s) and associated Exemption Notice(s) conditions.

For the purpose of this document, a Sub-surface Railway Station is as defined in Regulation 3 of the Fire Precautions (Sub-surface Railway Stations) Regulations 1989.

Following publication of the “Appleton Inquiry Report” in 1992, Clause 92 identified Quantified Risk Assessment (QRA) as a way forward in resolving difficulties and assisting in decision making.

LUL accepting that existing applicable stations are required to comply with the Regulations, discussed the subject of QRA with the LFCDA and then commissioned external consultants to produce ‘Quantified Risk Assessments’.

In October 1993 an omnibus QRA report was submitted to the LFCDA. The report was discussed by the relevant officers of both LUL and LFCDA. The guidance document details the agreed fire safety principles and standards arising from those discussions and to which stations they apply. In essence the top 13 stations of the relative risk index contained in the QRA report are to fully comply with the Regulations, the remaining 99 may be designed in accordance with agreed principles based upon the QRA or other previously agreed criteria.

It is understood, by both parties, that whilst the Regulations are prescriptive, the LFCDA will consider the granting of exemptions on the merits of each proposal. When exemptions are granted they may be conditional, and any conditions imposed must be complied with, failure to do so could result in exemptions being withdrawn and lead to station closure or prosecution.

No improvements to existing means of escape are required under the Regulations, but when major works are carried out at existing stations, the means of escape is to be improved (as far as possible) to that required for new stations. This procedure has been agreed with Her Majesty's Railway Inspectorate (HMRI).

This guide shall apply to all parts of the premises to which the Regulations apply and which are under the control of LUL and may control parts which are above ground level except those which are previously agreed with the LFCDA as being outside of the scope of the Regulations.

Where the Sub-surface Station boundary ceases before reaching open air, and open air is reached via another occupancy, the arrangements within that occupancy will need to be taken into account. It should be clear that although other occupancies should be taken into account, they may both be subject to the Sub-surface Stations Railway Regulations 1989. The exact boundary line must be agreed between LFCDA and LUL.

DEFINITIONS

Competent Person

A person or persons with sufficient training and experience or is/are proficient in the tasks to which they are assigned.

Dead End

Any point in a station premises where Means of Escape is in one direction only.

Gate Line

The gate line is to be taken as the collapsible gates at each stations boundary. The gate line must not be relocated without prior approval of the LFCDA.

GSM

A person who is accountable for the operation of LUL station(s) premises.

High Risk

Electrical Rooms:- including Switch Rooms, Communication Equipment Rooms, Relay Rooms, Sub-stations and Transformer Rooms.

Store Rooms

Bin Stores

Mess Rooms:- any room containing cooking facilities inclusive of microwaves.

Machine Rooms:- including Escalator and Lift motor Rooms but not including Fan or Pump Rooms when the electrical equipment contained within them is solely for operating the fan or pump.

Locker Rooms

Landlord Manager

Is the person who has accountability for the premises.

Low Risk

Office

Station Computer Room

Rest Rooms (that contain no cooking facilities)

Retail Units

Operations Rooms (subject to the details shown in part 7.1.1 of Sections 1 and 2).

Major Works

"Major Works" may be defined as "structural works which substantially alter the character or layout of a station and includes the conversion of a surface station into an underground station".

Nominal Fire Resistance

A non combustible barrier of inorganic construction with minimal leakage paths and low heat emission preferably capable of resisting fire for a period of 30 minutes or at least to preserve tenable conditions during the period of an evacuation past the nominally separated barrier/s when an alarm is actuated in any room of origin adjacent to the barrier.

All doors within such a barrier will be either self closing or kept locked shut when not in use and will as a minimum, comply with the details shown in the section referring to Half Hour Fire Resistance Doors in Appendix E of Section 2.

Open Ended Exemption

An exemption approved by the LFCDA and recorded on the Compliance Plans for a specific station.

Pre Start Meeting

Where works are subject to statutory third party approvals eg LFCDA these bodies shall be invited to these and any subsequent meetings and full approvals, as appropriate, obtained.

Short Term Exemptions

A written agreement between LUL and the LFCDA to allow an exemption to parts of the regulations for the period(s) of time shown on the exemption.

SECTION 1

INTRODUCTION

Compliant Stations

This section is devoted to the top thirteen (13) listed stations in the quantified risk analysis(QRA)report. The guidance within this section covers the following stations.

Method of Compliance with Section 12 Regs

<u>Station</u>	<u>Ranking</u>	<u>Engineered Solution</u>	<u>Full Compliance</u>
Oxford Circus	1	No	Yes
Victoria	2	No	Yes
Kings Cross	3	No	Yes
Baker Street	4	Yes	No
Bank/Monument	5	No	Yes
Charing Cross	6	No	Yes
Green Park	7	No	Yes
Holborn	8	No	Yes
Earls Court	9	Yes	No
Bond Street	10	Yes	No
Tottenham Ct Rd	11	No	Yes
Euston	12	Yes	No
Embankment	13	No	Yes

In all the above stations exemptions will be sought where it is agreed with the LFCDA that compliance is not reasonably practicable is unnecessary or inappropriate.

Engineered Solution

The basis of this method is to provide fire separation between staff and public areas, consisting of one hour fire resisting wall with sprinkler protection to the staff area. By their very nature, some parts of underground stations cannot be totally imperforate between staff and public, eg. Ticket offices and passenger operated machine rooms. To compensate for this the nearest practicable wall to the public area is used and sprinklers are installed within the room which is not separated from the public.

Where electrical and/or signal rooms are within the sprinklered area they are to be individually compartmented. Exemptions to the requirements to install automatic suppression systems are to be sought from the LFCDA. Plans of the fire precautionary arrangements of such rooms are to be the subject of early consultation with the LFCDA. This is to identify the additional requirements which may be necessary for the granting of exemptions.

Fully Compartmented

The remaining stations have retained the compartmentation designs agreed with the LFCDA in 1990/91.

Because of the problems associated with compartmenting escalator machine rooms and inclines, automatic sprinklers have been installed in upper and lower machine chambers as a compensatory measure. These measures are supplementary to the air sampling apparatus in upper machine chambers, and the sprinkler and linear heat detection used under the escalators. All entrances to machine chambers are to have thirty minutes fire resisting separation. Other parts of machine chambers and escalator inclines that connect to public areas have nominal thirty minute fire resisting separation.

STATUTORY INSTRUMENTS

1989 No. 1401

FIRE PRECAUTIONS

The Fire Precautions (Sub-Surface Railway Stations) Regulations 1989

Made 4 August 1989

Laid before Parliament 14 August 1989

Coming into force:

1. All regulations except 5(4) and (5), 6(3), (4), (6) and (8), 7(1) and (2) and 8(3) **18 September 1989**
2. Regulations 6(3) and 7(1) and (2) **1 January 1990**
3. Regulations 5(4) and (5) and 6(4), (6) and (8) **1 January 1991**
4. Regulation 8(3) **1 January 1996**

ARRANGEMENT OF REGULATIONS

1. Citation and commencement.
2. Interpretation.
3. Application of Regulations.
4. Precautions relating to means of escape in case of fire.
5. Means for fighting fire.
6. Means for detecting fire and giving warning in case of fire.
7. Fire-resisting construction in premises.
8. Materials used in internal construction of premises.
9. Instruction and training of persons working in premises.
10. Additional precautions to be taken.
11. Keeping of records of maintenance work, instruction and training.
12. Exemption from requirements.
13. Contravention of requirements.

In exercise of the powers conferred on me by sections 12(1), (3) and (4), 37(2) and (3) and 40(1) of the Fire Precautions Act 1971(a), and having consulted with such persons and bodies of persons as appear to me requisite, I hereby make the Following Regulations:

CITATION AND COMMENCEMENT

1. These Regulations may be cited as the Fire Precautions (Sub-Surface Railway Stations) Regulations 1989.
2. These Regulations, with the exception of the provisions specified in paragraph (3) below, shall come into force on 18 September 1989.
3. Regulations 6(3) and 7(1) and (2) shall come into force on 1 January 1990, Regulations 5(4) and (5) and 6(4), (6) and (8) shall come into force on 1 January 1991 and Regulation 8(3) shall come into force on 1 January 1996.
 - 1.2.1 Exemptions have been granted in accordance with Regulation 12 in individual cases where the LFCDA have been satisfied compliance was inappropriate, unnecessary or not reasonably practicable. The guidance which follows gives some indication of when exemptions may be granted. (See Regulation 12 regarding exemptions)

INTERPRETATION

2. In these Regulations -

"Fire Brigade" means a fire brigade maintained by a fire authority;

"Machine Room" means a room containing any electricity generator, transformer or switchgear or in which any machinery for operating an escalator, travolator or lift is installed;

"Station Manager" means the person employed to work in station premises who is for the time being in charge of the premises;

"Station Premises" means the premises to which these Regulations apply by virtue of Regulation 3 below; and

"Travolator" includes any mechanically operated moving footway other than an escalator.

2.1.1 Some definitions have needed further clarification because of the complexity of some stations, the following are examples of such clarification.

2.1.2 Machine Room

The definition obviously refers to escalator chambers, lift motor rooms and any areas not separated from them by fire-resisting construction. Similarly, electrical sub-stations, traction current switching equipment and heavy duty switchgear, transformers and inverters are also included.

2.1.3 Switch Rooms

By virtue of the word electrical switchgear being included in the definition these rooms are considered to come within the definition of "machine room" and in general the Regulations should be complied with in full. In appropriate circumstances exemption from Regulation 5(5) may be considered where Regulations 6(3) and 7(1) are complied with and

- 1) the floor area of the room does not exceed 20m²;
- 2) the room concerned is of low fire risk;
- 3) there is no storage or additional equipment placed in the room;
- 4) the construction of the room complies with Regulation 8(1).

2.1.4 Switch Cupboards

Small rooms of less than 4m² overall floor area containing only electrical switchgear and which comply with Regulations 6(3) and 7(1) may be regarded as "cupboards" rather than "rooms" for the purpose of Regulation 5(5) for fire fighting equipment provided the conditions in 2.1.3(2),(3) and (4) are met.

2.1.5 Station Computer Room

For the purpose of these Regulations, the SCR is normally considered to be an office containing computer equipment. (Provided the room contains no other switch gear and is not used for storage.)

NOTE: the above may vary where the Engineered Solution applies.

2.1.6 Pump & Fan Rooms

Pump and fan rooms are not electrical switch rooms unless they contain electrical equipment other than that required to operate the pump or fans.

2.1.7 Station Operation Room

Within existing stations all new operations rooms will be capable of providing resistance to fire for a period of not less than 30 minutes.

Where newly constructed or large refurbishment of stations are undertaken and an operations room is to be incorporated, it will be capable of providing resistance to fire for a period of at least one hour and will also have a protected route leading directly to fresh air which is constructed to the same standard as the operations room.

2(2) Fire Authority Definitions

2.2.1 Fire-resisting

A structure, door or hatch which is able to resist the passage of fire and heat for a minimum period of one hour when tested to the relevant part of British Standard 476 (currently part 21 or 22). Although no mention of the resistance of doors to the passage of cold smoke is made in the Regulations the Fire Authority reserves the right to require cold smoke seals on doors that are regarded as being in critical areas (e.g., poorly ventilated dead end conditions).

2.2.2 Maintenance of Means of Escape

All exits, stairways, lobbies, corridors and clearways shall be kept free of obstruction at all times.

All external routes including stairways, landings and clearways shall be maintained in a safe condition at all times, including as far as is reasonably practical keeping them free of ice and snow during inclement weather.

Whilst the public are on the premises, all doors or gates through which a person may have to pass in order to escape from the premises shall only be fastened so that they can be easily and immediately opened by persons using that route in an emergency, that is:

- a) the door or gate can be opened without the use of a key;
- b) the operation of the fastening is obvious to the user and is not a break glass fastening; and
- c) each door or gate is secured with a single device which when operated will simultaneously release each point of fastening.

NOTE: The following, although not controlled by the regulations, should also be considered.

In "non public" areas as far as is practicable, due consideration will be given to the standards laid down in relevant British Standard for means of escape and advice given accordingly and recorded.

Any new work in stations should wherever possible be in accordance with relevant British Standard in particular attention given to avoiding "dead end" conditions. In such conditions the travel distances will be applied as detailed in Appendix E.

External walkways, stairways or other structures forming part of escape routes should be examined by a competent person at intervals not exceeding three years and the date and results of that examination together with details of any remedial work necessary as a result of the examination recorded. (This record is to be kept by the Line Engineering Manager but will be made available for inspection on station premises at the time of programmed inspection).

2.2.3 Doors - Fire-Resisting

All fire-resisting doors shall be maintained effectively self-closing. As an alternative, fire-resisting doors may be held in the open position by automatic door holders which will automatically release the door on operation of the fire alarm. All doors fitted with automatic release devices must have a sign fitted to each face that states 'Automatic fire door keep clear'.

2.2.4 Automatic Door Holder

An electro magnetic device arranged to exert a magnetic flux upon the door or door closer sufficient to resist the operation of the closing device and arranged to release the door:

- a) upon the operation of the fire alarm system in the premises; or
- b) upon smoke detectors in the area either side of the door detecting the presence of smoke; or
- c) upon moderate manual pressure being applied to the door;
or
- d) upon failure of the electrical supply to the holding device.

2.2.5 Automatic Door Holders Testing - Approved Manner

Approved manner means:

Each smoke detection device installed in conjunction with a door holder shall be tested in accordance with the manufacturer's instructions relating to the testing of automatic fire detection. The operation of each door shall be checked whenever the fire alarm is tested. The date and results of the test should be recorded and kept on the station. In the event of failure of a holder, the affected door shall be maintained self-closing.

2.2.6 Fire Equipment Testing - Approved Manner

Approved manner means:

All equipment installed for fire fighting purposes will be tested by a competent person in line with the relevant British Standard. These tests must be recorded and the records must be maintained by the Line Engineering Manager but will be made available for inspection on the station premises at the time of programmed inspection.

2.2.7 Automatic Fire Detection System

A system complying with relevant British Standard and to the specification agreed with the Fire Authority.

2.2.8 Water Suppression Systems

Wet Sprinkler System
Alternate Sprinkler System
Pre-Action Sprinkler System
Domestic Sprinklers
Water - Fog (High and Low Pressure)

All the above systems will comply with the relevant British Standard where applicable or any other standard agreed between LUL and LFCDA.

APPLICATION OF REGULATIONS

- 3(1)** These Regulations apply to any premises used as a railway station to which members of the public have access (whether on payment or otherwise) and in which any railway platform is an enclosed underground platform.
- 3(2)** For the purposes of paragraph (1) above a railway platform -
- a) is an enclosed platform if the platform and the permanent way to which it is adjacent (whether with or without one or more other railway platforms) are situated wholly or mainly in a tunnel or wholly or mainly within or under any building; and
 - b) is an underground platform if the level of the roof or ceiling immediately above the platform and the permanent way to which it is adjacent is below the level of the surface of the ground adjacent to any exit from the railway station providing a means of escape from the station in case of fire, and a railway platform shall be regarded as situated mainly in a tunnel or mainly within or under a building if the platform and the permanent way to which it is adjacent are covered by any part of a tunnel or building for more than half the length of the platform.
- 3(3)** In their application to the premises referred to in paragraph (1) above these Regulations apply, subject to Regulation 13(4) below, to any part of the premises which is owned or occupied by the Crown.

PRECAUTIONS RELATING TO MEANS OF ESCAPE IN CASE OF FIRE

- 4(1)** All parts of station premises providing means of escape from the premises in case of fire, including railway platforms, escalators, travolators and lifts, shall be kept free from obstruction at all times when members of the public have access to the premises and shall be so maintained as to secure that they can be safely used as such means of escape at those times.

4.1.1 Exemption from Regulation 4(1)

Exemptions have been granted in respect of individual LUL stations when requested for the purpose of allowing works providing they have been initiated by an officer of the Fire Authority attending a Pre-Start meeting and issuing conditions and time limits (on form No. FS/FPA/11/2), if satisfied that the obstruction is reasonable, necessary and would not reduce the means of escape from the premises in an emergency to an unsatisfactory level. The Fire Authority should be given at least 7 working days notice of a pre-start meeting. Details of this procedure are outlined in the relevant L.U.L. Rules publications.

4.1.2 Emergency Notification

Where, for safety reasons, the station manager is unable to notify the Fire Authority prior to the closure of any area to the public, there are facilities for the station manager to send brief details of the problem to the Fire Authority in the form of a facsimile transmission.

NOTE:

- a) During office hours this should be passed immediately to LFCDA, Fire Safety Department, Queensborough House
Fax: 0171 587 4289
- b) All other times and at Weekends to LFCDA: Brigade Control, Brigade Headquarters
Fax: 0171 587 4158

- 4(2)** All parts of station premises shall be kept clear of any accumulation of combustible refuse or other combustible matter, and any combustible refuse stored in the premises pending its disposal shall be stored in an area set aside for that purpose.
- 4(3)** At all times when members of the public have access to station premises, and at other times when persons are at work in the premises, the door of, or barrier in, any doorway or exit through which a person might have to pass in order to leave the premises shall not be so locked or fastened that it cannot be easily and immediately opened in case of fire in the premises.

(This also applies to UTS gates).

4.3.1 Staff Emergency Exits when Station Closed

When the station is closed to the public, but when other persons may be on the premises, any exit through which they might have to pass in order to leave the premises shall be easily openable without the use of a key. This is considered to mean that every ticket hall or emergency exit route should have at least one exit (e.g., Bostwick Gate) fitted with a push bar or simple lever type latch which could be easily opened in an emergency. Where there are several exits available, the one fitted with the emergency release should have a distinct sign(s) to indicate it, which should be visible from all directions. All staff working on the station are to be familiarised with these arrangements.

- 4(4)** Where a door in station premises is designed to be held open by an electromagnetic or electro-mechanical device to which this paragraph applies, the door and the means for holding open and closing the door shall be maintained in efficient working order and the door shall not be held open by any device or object other than the electromagnetic or electro-mechanical device.
- 4(5)** Paragraph (4) above applies to an electromagnetic or electro-mechanical device which allows a door held open by it to be operated manually at all times and to close automatically on each or any of the following occurrences, that is to say -
- a) the operation of a system for giving warning in case of fire;
 - b) the manual operation of a switch for releasing the device;
 - c) a failure in the supply of electricity to the device.

4.5.1 Electromagnetic Door Holders

See interpretation 2.2.4 and 2.2.5

- 4(6)** In any passage or other area affording a means of escape from station premises in case of fire or giving access to such a means of escape, every door of a doorway which does not form part of, or give access to, the means of escape shall be kept locked at all times when the part of the premises to which the doorway gives access is neither in use by any person who is at work in the premises nor available for use by members of the public.

4.6.1 Doors to Passageway and Rooms

Any door leading from a passenger area or an emergency exit route must be kept locked unless it leads only to an occupied room or to a telephone kiosk where HMRI requires it to be kept unlocked.

- 4(7)** Every doorway or other exit affording a means of escape from the station premises in case of fire or giving access to such a means of escape, including the means of exit in ordinary use by members of the public, shall be distinctively and conspicuously marked by a notice indicating that it is an ordinary means of exit or (as the case may be) an emergency exit from the premises.

4.7.1 Exit Signs

All exits must be indicated as an exit or an emergency exit. Signs should be in accordance with those agreed with LUL by the Fire Authority. In general the relevant British Standard should be complied with and the Fire Authority consulted before any different signs are used.

4.7.2 Signs

In the event of an evacuation being necessary, any signs on routes leading to an exit which is not normally used as such i.e., one way systems must either automatically change to clearly indicate that it is an emergency exit or marked "exit in emergency only" and the evacuation plan should provide for staff members to direct the public via this exit.

- 4(8)** All parts of station premises forming part of the means of escape from the premises in case of fire shall be provided with artificial lighting capable of providing sufficient illumination of those parts of the premises and any notice required by paragraph (7) above to enable persons in the premises to leave the premises safely in case of fire.

4.8.1 Illumination of Exit Routes

The current LUL standard for lighting levels are acceptable to the Fire Authority, however any proposed changes are to be discussed and agreed with the LFCDA prior to implementation.

- 4(9)** The lighting required by paragraph (8) above shall be provided by electricity supplied from two independent sources of supply so controlled that, so far as is reasonably practicable, the requirements of that paragraph continue to be met in the event of any failure in the supply of electricity from one of the two sources of supply.

NOTE: Failure of 1 of the lighting supplies would mean that the premises are closed until such time as the second independent source of supply becomes available. Two supplies must be available at all times.

4.9.1 Emergency Lighting

On LUL stations, every 4th light is supplied by a separate electricity supply. This is accepted as compliance with Regulation 4(9). Where signs require illumination they should work off both circuits or be a maintained emergency light with a three hour battery back-up which may be a self-contained unit.

MEANS FOR FIGHTING A FIRE

- 5(1) Subject to the provisions of this regulation, station premises shall be provided with such means for fighting fire as are appropriate and adequate in relation to the risk to persons in case of fire in the premises.

5.1.1 Provision of Fire fighting Equipment

The equipment provided at stations will vary according to the circumstances, but generally, will consist of a combination of Aqueous Film Forming Foam (AFFF) and carbon dioxide (CO₂) extinguishers.

These will be located at strategic points around the station as may be agreed between the Fire Authority and the station manager. Some will also be located in fire points. It is recommended that each fire point should contain an inventory of its contents.

Fire points will often be in the form of a cabinet. Where there is a danger of vandalism, theft or for strong security reasons the doors of these cabinets may be alarmed; they must be secure but not locked shut.

All fire fighting equipment and automatic fire fighting equipment should be tested annually to the appropriate British/European standard (This record is to be kept by the Line Engineering Manager but will be made available for inspection on station premises at the time of programmed inspection).

- 5(2) The location of each fire hydrant in station premises shall be indicated by a distinctive and conspicuous notice in a position above or adjacent to the fire hydrant.

5.2.1 Fire Point Indication

Fire points in deep stations and in existing "cut and cover" stations will normally contain a fire hydrant. All fire points are required to be clearly indicated by a sign.

- 5(3) The outlet connection of every fire hydrant in station premises shall be of such a type as is compatible with the type of attachment on hoses used by the fire brigade for the purpose of drawing water from fire hydrants.

5.3.1 Fire Hydrants

Fire hydrants should be charged to between 2.5 and 4.5 bars pressure and have fittings compatible with fire service equipment. Fire hydrant cabinets should also contain sufficient lengths of 45mm hose to cover the risk at platform level and to reach the base of the escalators and at least 1 hand controlled branch.

Testing:- See 2.2.6

- 5(4)** Every escalator and travelator in station premises shall be provided with a means for fighting fire comprising a water sprinkler system which is activated automatically on the operation of the means for detecting fire with which the escalator or travelator is provided under Regulation 6(1) below.

5.4.1 Escalator Sprinklers

All escalators and travelators are to be fitted with a ESCALATOR SPRINKLER PROTECTION system actuated by the linear heat detector as described in Regulation 6(1).

- 5.4.2** Escalators and travelator sprinkler systems may have to be shut down in order to carry out repairs and maintenance to an escalator. There must therefore be such valves as are necessary to isolate escalators individually.

- 5(5)** The following parts of station premises shall be provided with means for fighting fire comprising a system which is activated automatically in such a part of the premises in the event of any outbreak of fire in that part of the premises, that is to say -

- a) a machine room other than a machine room in which machinery for operating an escalator, travelator or lift is installed;
- b) any storage area, including an area set aside for storing refuse pending its disposal;
- c) any part of the premises used as a shop.

5.5.1 Automatic Fire fighting Equipment

Areas described in a, b and c of Regulation 5(5) are required to be fitted with an automatic fire fighting system. (See 2.2.8)

NOTE: If a wet system is used in a lift motor room safeguards must be incorporated to ensure the sprinkler system cannot operate until the lift has been returned to the upper landing.

- 5.5.2** All automatic systems must be connected to the station fire alarm panel.

- 5(6)** All means for fighting fire in station premises shall be maintained in efficient working order and all portable equipment for fighting fire in the premises shall be so placed as to be readily available for use.

5.6.1 Maintenance

All fire fighting equipment shall be tested and maintained in accordance with the relevant British Standard.

- 5(7)** When any person employed to work in station premises reasonably suspects that there is an outbreak of fire in the premises, immediate steps shall be taken to activate the system for giving warning in case of fire referred to in regulation 6(4) below and to call for the assistance of the fire brigade.

- 5(8)** A plan of the station premises suitable for use by members of the fire brigade when attending the premises for fire fighting purposes shall be kept in, or affixed to, a part of the premises where it is accessible to members of the fire brigade in such an event.

5.8.1 Plans Box

A box containing station plans is situated outside every station in a position agreed by the Fire Authority. These boxes can be opened using an FB14 key and also have the facility to be easily opened using bolt croppers.

- 5.8.2** The plans will be updated by the railway architect, but temporary alterations may be made by the local Fire Station Commander using a spirit marker in conjunction with the GSM.

NOTE: The LFCDA Fire Safety Department will notify the local Station Commander of any temporary works which could affect means of escape, access or fire fighting arrangements on the station.

MEANS OF DETECTING FIRE AND GIVING WARNING IN CASE OF FIRE

- 6(1)** Every escalator and travolator in station premises shall be provided with a means for detecting fire comprising a linear heat detector system.
- 6(2)** Any machine room in station premises in which machinery for operating an escalator, travolator or lift is installed shall be provided with a means for detecting the presence of smoke in the room.
- 6(3)** The following parts of station premises shall be provided with a means for detecting fire which is activated automatically in case of fire in such a part of the premises, that is to say -
- a) every part of the premises required by regulation 5(5) above to be provided with the means for fighting fire referred to in that provision;
 - b) any office which is not separated from other parts of the premises by fire-resisting construction within the meaning of regulation 7(6) below;
 - c) any staff room for persons employed to work in the premises.

6.3.1 Areas Covered by Fire Detection Equipment

Although the Regulation is self explanatory, the Fire Authority will recommend that all rooms are fitted with automatic fire detection with the exception of staff toilets. Disused areas which are secured and contain no combustible materials or source of ignition, need not be covered by the automatic fire detection system.

6.3.2 Fire Alarm Panel

All fire detection equipment will be connected to a control panel generally located in the station operations room. If there is no SOR then the panel must be positioned so as to be readily accessible to station staff and from the station entrance. At some stations a repeater panel is provided. These are to be similarly located.

- 6(4)** The station premises shall be provided with an electrically operated system for giving warning in case of fire which -
- a) is designed to transmit any such warning to a place where it can be received by the station manager or by some other person employed by the occupier of the premises; and
 - b) is capable of being activated both by manual operation at call points in the premises, including call points for use by the public, and by any of the means referred to in paragraph (1) to (3) above for detecting fire or the presence of smoke in the premises.

6.4.1 Fire Alarm System

The fire alarm call points whether installed at platform level, on public escape routes or other areas must be positioned in accordance with the current British Standard.

6.4.2 Fire Alarms

On receipt of an alarm of fire from any source at the central panel, the fire brigade will be informed immediately via the railway line control. Station staff will advise Line Controller of alarm who will then advise Network Control Centre who are responsible for calling the Fire Brigade.

6.4.3 Automatic Messages

Fire alarm panels in LUL premises are to be programmed to put out alert and evacuation messages automatically over the public address system.

6.4.4 Automatic Evacuation

In the event of an alarm being raised and the alert signal not being acknowledged within an agreed time (pre-set between 30 and 120 seconds) evacuation will be commenced automatically.

6(5) Where a call point for a system for giving warning in case of fire is situated in a part of station premises to which members of the public have access, there shall be displayed at or near the call point a notice giving information as to how to use the call point to activate the system.

6(6) The station premises shall be provided with a public address system for use by or on behalf of the occupier of the premises to give warning of fire to members of the public in the premises and advise them of the action to be taken by them in case of fire.

6.6.1 Public Address

The public address system is part of the fire alarm system and must provide clear instructions covering all public and staff areas. In some circumstances in high background noise, sounders or lights may be provided in staff areas.

The public address system controls will normally be located in the station operations room or station control room. Any deviation from this must be agreed with the Fire Authority.

As the public address system is part of the fire alarm it must comply with relevant British Standard for Fire Alarm Systems.

6(7) All means for detecting fire and for giving warning in case of fire in station premises shall be maintained in efficient working order.

- 6(8)** In station premises arrangements shall be made to secure that in case of fire the station manager and any person employed to work as a member of the staff of the station premises who is on duty in any part of the premises can communicate with each other by personal radio or by telephone.

6.8.1 Personal Radio/Communications

All staff to be in telephone or radio communication with each other.

This may be direct or via the station operations room.

FIRE RESISTING CONSTRUCTION IN PREMISES

- 7(1)** A part of station premises to which this paragraph applies shall, so far as is reasonably practicable, be separated by fire-resisting construction from other parts of the premises, including any other part of the premises to which this paragraph applies.

7.1.1 Fire Separation

The following groups of rooms require to be separated by fire-resisting construction:

Machine rooms
Staff rooms
Store rooms
Offices with cooking facilities
Sub-stations
Transformer rooms

Where rooms within an area are fully sprinklered, exemption may be granted to Regulation 7(1) provided there is imperforate one hour separation from the public area. (See description of Engineered Solution in the Introduction to Section 1 on Page 7).

If there are rooms within the sprinklered area that are not covered by sprinkler protection, and an exemption from Regulation 5(5) is required, then these rooms must comply fully with 7(1) compartmentation. (See Introduction)

Where there are adjoining rooms of a similar nature i.e., electrical switch rooms and relay rooms, then 7(1) compartmentation may be achieved by providing compartmentation around the exterior walls of the suite of rooms and not providing 7(1) compartmentation between the individual rooms. The total floor area of such a suite of rooms protected in this way should not exceed 60 m², lobbies, toilets and passageways being discounted in assessing the 60 m². The restriction to 60 m² does not apply to transformer rooms and sub-stations.

NOTE: Where future operations/control rooms are constructed and are to contain equipment that is used for monitoring or controlling evacuations, the location and level of fire resisting construction must be agreed with the LFCDA.

It is expected that as part of the design for new Station Operation rooms that a protected route from “fresh air” will be provided for the emergency services.

7.1.2 Escalator and Travolator Chambers

It is generally accepted that compliance with Regulation 7(1) is very difficult to achieve and is not reasonably practicable, however every effort should be made to prevent smoke entering public areas, and affecting means of escape. Physical, mechanical and electrical defences (AFD to give early warning) should be used in conjunction with the above to protect these areas.

Means for mitigating the spread of smoke may be:-

- a) the use of non-combustible materials to seal up openings and gaps to provide a barrier against the spread of smoke (other than small openings or gaps necessary for the working of moving apparatus); and/or.
- b) openings necessary for ventilation purposes should be protected by smoke dampers operated by the automatic fire alarm system.
- c) all escalator machine chambers (upper & lower) shall be provided with smoke detection and sprinklers. In certain circumstances the LFCDA may agree to the non provision of sprinklers.
- d) every escalator shall be protected by linear heat and escalator sprinkler protection.
- e) where escalator machine chambers interconnect on the lateral plane each chamber should be separated to a standard that would prevent smoke entering each other. This standard is interpreted to mean nominal half-hour fire resisting.
- f) where a machine chamber services more than one escalator it will be deemed to be a single escalator machine chamber.
- g) where escalator machine chambers interconnect on the vertical (or angled) plain no separation is required between them.

7.1.3 Lift Motor Rooms

With regard to Regulation 7(1) either full compliance or, where it is not reasonably practicable, the same standards as for escalator and travellator machine chambers should be applied to lift motor rooms, (See 7.1.2). Where external walls are direct to fresh air and where mechanical or natural ventilation is provided the above does not apply.

- 7(2)** Paragraph (1) above applies to the following parts of station premises, that is to say a machine room, any storage area other than an area referred to in paragraph (3) or (4) below, and a staff room for persons employed to work in premises.
- 7(3)** Any explosive or highly flammable materials kept in station premises shall be stored in an area separated from other parts of the premises by fire-resisting construction.

7.3.1 Explosive and Highly Flammable Materials

It has been agreed between LUL and LFCDA explosive and highly flammable materials will not be stored within a sub-surface station.

7.3.2 Flammable Liquid Storage

Permanent Way Staff use a considerable amount of paraffin for oil lamps and for cleaning grease from machinery.

Most of their stores will contain up to two five gallon/25 litre screw cap metal containers which will be kept within a flame proof metal bin.

7.3.3 At strategic locations, a store referred to as a 'high-flam' store will contain rather more paraffin which is similarly stored. The construction of these rooms should be identical to any other store except that if the paraffin and methylated spirits containers are not within a flame proof metal bin the doorway will require a bund to prevent any spillage or leakage escaping from the store.

The Maximum agreed Storage for a LUL high flammable store is:

70 litres paraffin in 3 containers
1 litre methylated spirits in 2 containers
70 litre grease in 1 metal bin
Wooden pit blocks in 4 metal bins
Rags/nylon in 1 metal bin

7(4) An area set aside for storing combustible refuse in station premises pending its disposal shall be separated from other parts of the premises by fire-resisting construction.

7.4.1 Refuse Stores

Where refuse is stored within the station it must be in a room conforming to the standards required of a store in 5(5), 6(3) and also the fire resistance specified in Regulation 7.

7.4.2 The automatic fire fighting equipment in refuse stores (Bin Rooms) should be an automatic sprinkler system. In cases of difficulty of water supply 'domestic' type sprinkler in accordance with appropriate BS/LPC standard will be considered. Only if it is proved that the above cannot be achieved and as such unreasonable to provide a sprinkler system will stand alone "water-fog" be accepted as an alternative. In every instance agreement must be reached with LFCDA prior to installation.

7(5) Where a door forms part of any fire-resisting construction required by this regulation, the door shall be fitted with a self-closing device and each face of the door shall have affixed to it a notice displaying the words "**FIRE DOOR - KEEP SHUT**".

7.5.1 Some doors may be fitted with electro-magnetic holding devices. Refer to 2.2.3.

7(6) Any reference in this regulation to fire-resisting construction is a reference to construction of such a nature as to be capable of providing resistance to fire for a period of not less than one hour.

7.6.1 Standard of Fire Resistance

The Fire Authority will only grant exemption from this standard where other compensatory features can be demonstrated.

7.6.2 In some instances it may be desirable to achieve this by two half hour doors separated by a lobby. This must be agreed with the LFCDA.

MATERIALS USED IN INTERNAL CONSTRUCTION OF PREMISES

- 8(1)** Any material which is used on or after 18 September 1989 in the construction of an internal wall or ceiling in any part of station premises to which members of the public have access shall be non-combustible or have low heat emission, and any material which is applied on or after that date to the surface of an internal wall or ceiling in such a part of the premises shall offer adequate resistance to the spread of flame over the surface of the material and shall have, if ignited, a reasonable rate of heat release.

8.1.1 Materials for Walls and Ceilings

New surfaces, paints, ceiling panels are to be non-combustible as described in Regulation 8(4). It does not mean that new fire doors may not be made of wood, but it is understood that as far as possible architraves and skirting should be hardwood, and be treated with fire-retardant paint or varnish.

8.1.2 Posters

Where conventional paper advertisement posters are required, they will be acceptable subject to:-

- a) The posters shall be applied to a non-combustible surface.
- b) Only water based adhesive to be used.
- c) Corners and edges to be firmly adhered.
- d) A maximum of four layers of paper to be applied before stripping back to non-combustible surface.
- e) A maximum of eight posters plus one backing sheet to be applied to trackside sites to which the public do not have access.

NOTE: The above will be subject to regular inspections and where these conditions are not being maintained, contraventions to the regulations will exist. This will include posters/notices displayed in a non approved advertising area.

- 8(2)** The material of which any balustrade, decking or skirting board of an escalator or travellator in station premises is constructed, and the material of which any display panel for advertisements or notices in an escalator shaft in the premises is constructed, shall offer adequate resistance to the spread of flame over the surface of the material and shall have, if ignited, a reasonable rate of heat release.
- 8(3)** The material of which the treads and risers in the steps of any escalator in the station premises are constructed shall offer adequate resistance to the spread of flame over the surface of the materials and shall have, if ignited, a reasonable rate of heat release.
- 8.3.1** This part of the regulations became exemptable by statutory instruments 1994 No. 2184 on the 1st January 1996. See appendix 1F.

8(4) For the purposes of this regulation material shall be regarded -

- a) as non-combustible if it is material deemed non-combustible according to the test criteria specified in British Standard 476: Part 4 1970 (as amended by amendment slips AMD 2483 and AMD 4390);
- b) as having low heat emission if it is of such a nature that if tested in accordance with British Standard 476: Part 11: 1982 it would not flame and would produce no rise in temperature on either the specimen or the furnace thermocouples;
- c) as offering adequate resistance to the spread of flame over its surface and having a reasonable rate of heat release if the material or, where it is bonded throughout to a substrate, the material combined with the substrate, is of a nature that it would comply with the test criteria set out in relation to Class 1 in British Standard 476: Part 7: 1987 and, when tested in accordance with British Standard 476: Part 6: 1989, would have an index of performance (I) not exceeding 12 and sub-index (i) not exceeding 6.