Gníomhaireacht Éileamh an Stáit
State Claims Agency

Guidance on Statutory Inspections

Reference Tool

This Guideline has been produced solely for use by State Authorities that come within the remit of the State Claims Agency, as established by the National Treasury Management Agency (Amendment) Act, 2000. The State Claims Agency does not bear responsibility for use of the guideline or reliance on it in any manner by any other third party.

Executive Summary

The information contained in this document should assist your Authority in complying with its legal obligations in relation to inspecting and testing of equipment and machinery. It should be used as a guide when planning, scheduling and monitoring inspections and testing.

The various items of equipment and machinery covered in the document are listed in the Index of Equipment below. For each item the following details are provided:

- Applicable Statutory Instrument (S.I.) / Code of Practice/Standard;
- Requirements of relevant S.I. / Code of Practice/Standard – this provides a summary of the minimum inspection requirements for each piece of equipment/machinery. In some cases it may be necessary to refer to the actual documents i.e. standard, S.I. etc for full details.

This is a non-exhaustive list of equipment and machinery, and their required inspections. It is strongly recommended that each Authority conduct a review of all equipment and machinery, this should involve:

- development of a register of all machinery and equipment;
- identification of inspection and testing requirements, including timeframes, for each type or item of equipment;
- detail of who is responsible for carrying out the testing and inspection. Where this involves a third party, list this party and the person within your organisation responsible for liaising and monitoring with the third party service.

It should also be remembered that this is not an exhaustive list of the various pieces of legislation, codes of practice or standards that should be referenced in the relation to the management of health and safety or fire safety.

It should also be noted that this is not an exhaustive list of legislation, codes of practice or standards that may apply to your Authority in relation to the management of health and safety or fire safety.

Should you require any further information in relation to the information in this document or in respect of items of machinery or equipment not covered in this document please do not hesitate to contact the State Claims Agency, Risk Management Unit.

Terms of Reference

(1) Statutory Inspections

Checks, inspections or tests specified in a Statutory Instrument i.e. Act and/or Regulation that are a legal requirement.

(2) Code of Practice

Codes of practice typically give practical guidance on their subject matter. They are not legally binding and as such do not have to be followed exactly. However, where the code of practice gives practical guidance on relevant statutory provisions then compliance or non-compliance with those provisions of the code may be admissible in evidence in any criminal or civil proceedings.

A person may also be able to comply with the law by adopting alternative measures to those set out in a Code of Practice, provided that those alternative measures achieve the objective of the statute or Regulation to which the Code of Practice relates. However, in a safety and health prosecution or a civil liability claim the onus of proof would rest with the defendant to show that he/she was not negligent and /or in breach of a statutory duty and that all reasonable measures were adopted to prevent against injury.

(3) Irish Standard (IS)

Refers to Irish Standards published by NSAI, which operates under the National Standards Authority of Ireland Act, 1996, on behalf of the Minister for Enterprise, Trade and Employment. These standards are standard specifications for their topic area and conformance with the standard as certified by NSAI provides proof of compliance with requirements of national standard specifications approved by The Minister for Enterprise, Trade and Employment.

(4) Irish Standard EN (IS EN)

EN standards aim to establish a European wide standard in a given subject area. European Standards are typically produced by European technical committees and must be given the status of a national standard, either by publication of an identical text or by endorsement and conflicting national standards must typically be withdrawn. These standards when transposed into an Irish context are denoted as IS EN.

(5) British Standard (BS)

Standards produced by the British Standards Institute. These are referenced in this text only where an applicable Irish Code of Practice or Standard (either IS or IS EN) does not exist IS, IS EN or Irish Codes of Practice should always take precedence over BS.

Index of Equipment and Machinery

Section 1 – Inspections covered in Statute

Section 2 - Inspections Required by Codes of Practice

Section 3 - Inspections covered in Standards

Section 1

Statutory Inspections

Passenger/Goods Lift

Applicable S.I / Code of Practice/Standards:

- European Communities (Lifts) Regulations, 1998.
- EC Directives 95/16/EC (Lifts Directive).
- IS EN 13015:2001 Maintenance for lifts and escalators— Rules for maintenance instructions.
- Safety, Health and Welfare at Work (General Application) 2007.

Requirements of European Communities (Lifts) Regulations, 1998

The European Communities (Lifts) Regulations, 1998 gives effect to the EU Lifts Directive (95/16/EC) and is concerned with permanent lifts that service buildings and their associated safety components. It does not specify a standard that the lift should comply but gives Essential Health and Safety Requirements (listed in Annex I of Directive) relating to the design and construction of lifts and safety components to which the product should comply.

Lifts for the purposes of the Directive are defined as appliances serving specific levels, having a car moving along guides which are rigid and inclined at an angle of more the 15 degrees to the horizontal and intended for the transport of persons, persons and goods, or goods alone but which persons could enter without difficulty and which have controls which are reachable by persons inside.

It also covers six categories of safety components listed in Annex IV of the Directive (listed below):

- Devices for locking landing doors;
- Devices to prevent falls or uncontrolled upward movements of the car in the event of a power cut or failure of components of the lift;
- Over speed limitation devices;
- Energy-accumulating shock absorbers:
  - — Either non-linear;
  - — Or with damping of the return movement.
- Energy-dissipating shock absorbers;
- Safety devices fitted to jacks of hydraulic power circuits where these are used as devices to prevent falls;
- Electric safety devices in the form of safety switches containing electronic components.

Specific kinds of lifts and lifting equipment are excluded from the Directive's application, these are listed below:

- Cableways, including funicular railways, for the public or private transportation of persons;
- Lifts specially designed and constructed for military or police purposes;

- Mine winding gear;
- Theatre elevators;
- Lifts fitted in means of transport;
- Lifts connected to machinery and intended exclusively for access to the workplace;
- Rack and pinion trains;
- Construction-site hoists intended for lifting persons or persons and goods.

A lift or safety component bearing the CE marking which is accompanied by the EC declaration of conformity (contents of which are specified in Annex II of the Directive) shall be deemed to comply with these Regulations.

The CE Marking is not a mark indicating conformity to a standard but rather a mark indicating conformity to the legal requirements of EU Directives – in this case the lifts directive. In Ireland NSAI exercise control over the use of the CE Marking.

The directive gives various routes to achieve compliance (details of which are specified in Article 8 and various Annexes to the directive).

Requirements of IS EN 13015:2001

IS EN 13015:2001 Maintenance for lifts and escalators — Rules for maintenance instructions is a European Standard that supports requirements of EC Directive 95/16/EC (Lifts Directive). Compliance with this standard provides one means of conforming to the specific essential requirements of the Directive.

Existing installations[1] are not covered by this Standard, but it can be taken as a reference.

This standard requires that installations covered shall be maintained in good working order in accordance with the installer's instructions. This means regular maintenance of the installation should be carried out, to ensure, in particular, the safety and reliability of the installation. Also the access and the associated environment shall be maintained in good working order in accordance with the installer instructions.

According to this standard the installer of a lift should provide the instructions for the owner of an installation and the maintenance organisation detailing maintenance requirements according to the Lifts directive after completion of the installation, and as a result of a risk assessment. These instructions should be written in a manner that can be easily understood by competent maintenance persons and should take account of:

- The specifications and the intended use of the installation (type of installation, performance, type of goods to be transported, type of users, etc.);
- The environment in which the installation and its components are installed (weather conditions, vandalism, etc.);
- Any restriction of use;
- The result of the risk assessment (covered in clause 5 of the standard) for

[1] Completely installed passenger lift or good passenger lift or accessible goods only lift or service lift or escalator or passenger conveyor

every working area and for every task to be undertaken;
- The specific maintenance instructions provided by the manufacturer of safety components;
- In case of components other than safety components, where maintenance is necessary, the maintenance instructions provided by the manufacturer of these components.

Information that must be passed on to both the user and maintenance organisation on tasks they must perform is extensive and is detailed fully in the standard. In particular the installer should provide information for the owner on the need for a maintenance organisation to be employed to maintain safe operating conditions and include details on the need to carry out maintenance periodically. In determining frequency of maintenance the following list should be considered (non exhaustive):

- Number of trips per year, operating time and non-operating periods of time;
- Age and condition of installation;
- Location and type of building and users and/or goods transported;
- Local environment where the installation is situated and external environmental elements e.g. weather, vandalism.

In addition to those examinations and tests which the owner of the installation entrusts to the maintenance organisation, the information provided should detail the need for the owner to carry out periodically, in their own interests, the following for lifts:

- A full ascent and descent to assess any changes in the quality of the ride or damage to the equipment. Typical items to be checked to ensure that they are in place, undamaged and functioning correctly are:

    - Landing doors and bottom door tracks;
    - Stopping accuracy;
    - Indicators that are not located in a reserved area;
    - Landing push controls;
    - Car push controls;
    - Door open controls;
    - Two-way means of communication in the car which provides permanent contact with a rescue service;
    - Normal car lighting;
    - Door reversal device;
    - Safety signs/pictograms.

For goods only and service lifts the checks to be carried out are the same, when relevant.

[2] Power-driven installation with endless moving walkway (e.g. pallets, belt) for the conveyance of passengers, either on the same or between different traffic levels

For escalators/passenger conveyors[2]:

- A full travel in both directions, when they exist, to assess any changes in the quality of the ride or damage to the equipment. Typical items to be checked to ensure that they are in place, undamaged and functioning correctly are:

    - All lighting and indicators;
    - Emergency stopping device;
    - Hand rails;
    - Skirting/deflector devices;
    - Combs;
    - Safety signs/pictograms;
    - Approximation of speed between handrail and steps/pallets;
    - Steps/pallets;
    - Balustrade and panels;
    - Head guard and decking.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

See next section on hoist/mobile elevating work platform.

Hoist/ Mobile Elevating Work Platform (e.g. Cherrypicker)

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007

"Hoist or lift" means a lifting machine which has its direction of movement restricted by a guide or guides but does not include;

- A fork lift truck, order picker, self- propelled variable reach truck or similar type equipment;
- Platform lifts for use by persons with impaired mobility;
- Lifting equipment intended for lifting performers during artistic performances or
- Lifting equipment fitted in means of transport.

Hoists and lifts should undergo a thorough examination once every 6 months according to the requirements of the regulations.

Mobile Elevating Work Platforms should undergo a thorough examination once every 6 months according to the requirements of the regulations.

A report containing details required under Schedule 1 to regulations of the results of every such examination should be produced. (See Appendix 1)

Work Equipment

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007
- European Communities (Machinery) Regulations, 2001
- ISO 12100-2:2003 Safety of Machinery – Basic Concepts, General Principles for Design – Part 2: Technical Principles

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

"Work equipment" means any machinery, appliance, apparatus, tool or installation for use at work.

It is a requirement of these regulations that where work equipment is exposed to conditions causing deterioration that may result in danger:

- Periodic inspections and, where appropriate, testing is carried out;
- Special inspections are carried out when exceptional circumstances arise which might make the work equipment unsafe including modifications, accidents, prolonged activity or natural phenomenon;
- Deterioration is detected and remedied in good time.

Inspections must be carried out by a competent person and appropriate to the nature, location and use of the work equipment. Equipment used in another place of work, must be accompanied by evidence of the last inspection carried out

Results of inspections should be recorded and kept available for 5 years from the date of inspection.

Necessary measures must be taken to ensure that throughout its working life work equipment is kept, by means of adequate maintenance, at a level such that it complies with the requirements of Chapter 2 of the General Application Regulations and relevant EU Directive's as they apply (*this is dependant on type of machinery in question, certain types of machines are covered under specific legislation/standards/Codes of practice – the existence of these should be checked for individual pieces of machinery e.g. woodworking machinery covered under variety of IS EN standards).*

Where possible maintenance operations shall be carried out when equipment is shut down. Where this is not possible, it shall be necessary to take appropriate protection measures for the carrying out of such operations or for such operations to be carried out outside the area of danger. If any machine has a maintenance log, it shall be kept up to date.

Requirements of European Communities (Machinery) Regulations, 2001.

The European Communities (Machinery) Regulations, 2001, which transpose European Directive 98/37/EC into Irish law, also need to be considered although their requirements relate mainly to suppliers and manufacturers of machinery. These Regulations apply to all new machinery manufactured or supplied in Ireland, wherever it is to be used in the EEA (The European Economic Area)

These regulations relate to "Machinery" and safety Components as defined in EC Directive 98/37/EC on the approximation of the laws of the Member States relating to machinery. For the purposes of this Directive 'machinery' means:

- An assembly of linked parts or components, at least one of which moves, with the appropriate actuators, control and power circuits, etc., joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material;

- An assembly of machines which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole;

- Interchangeable equipment modifying the function of a machine, which is placed on the market for the purpose of being assembled with a machine or a series of different machines or with a tractor by the operator himself in so far as this equipment is not a spare part or a tool.

'Safety components' means a component, provided that it is not interchangeable equipment, which the manufacturer or his authorised representative established in the Community places on the market to fulfil a safety function when in use and the failure or malfunctioning of which endangers the safety or health of exposed persons.

Certain types of machinery are excluded those of note include; steam boilers, tanks and pressure vessels, storage tanks and pipelines for petrol, diesel fuel, inflammable liquids and dangerous substances, means of transport, lifts which permanently serve specific levels of buildings and constructions (full list in Article 3 of Directive)

The existence of CE marking on machinery should indicate that the manufacturer has met all of the requirements that are relevant although this should not be assumed and the end user must still ensure machinery supplied is fit for use via an initial inspection.

This directive states that manufactures should supply information on maintenance and safe operating conditions of machines for users.

Requirements of ISO 12100-2:2003

Safety of Machinery – Basic Concepts, General Principles for Design – Part 2: Technical Principles (ISO 12100-2:2003) supports essential requirements of EC Machinery Directives. This also stipulates suppliers of machinery must provide information for maintenance and provide examples of what this information should contain (listed below):

- Nature and frequency of inspections for safety functions;
- Instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists);
- Instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by users (e.g. operators);
- Drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks).

Ladders

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007;
- Guide to the Safety, Health and Welfare at Work (General Application) Regulations, 2007, Part 4: Work at Heights;
- Using Ladders Safely - Information Sheet, The Health and Safety Authority;
- BS EN 131-3: 2007 Ladders: Part 3- Users Instructions.

Requirements of the Safety, Health and Welfare at Work (General Application) Regulations, 2007

Under the Safety, Health and Welfare at Work (General Application) Regulations, 2007 a ladder includes a fixed ladder and a step ladder.

Ladders should be inspected at suitable intervals where they are exposed to conditions causing deterioration liable to result in danger. Where exceptional circumstances have occurred that are liable to jeopardise the safety of the work equipment it should be inspected as soon as possible following these circumstances.

Requirements of the Guide to the Safety, Health and Welfare at Work (General Application) Regulations, 2007, Part 4: Work at Heights/ Using Ladders Safely - Information Sheet, The Health and Safety Authority

Regular visual checks should be made for damage such as cracked or bent stiles or rungs, corrosion and defective or missing fittings.

Prior to Use
Before using the ladder you must visually check it at least daily. To enable the user to carry out checks training is required in relation to what to look for. A person should only use a ladder if competent to do so. The inspection should pick up obvious defects such as:

- cracked or bent stiles or rungs;
- corrosion;
- defective or missing fittings or ties.

Regular Intervals
You must inspect and maintain the ladder at regular intervals to ensure the equipment is in safe working condition. The time between inspections should be based on risk assessment and the manufacturer's instructions. Where exceptional circumstances have occurred (e.g. impact to ladder or tampering) the ladder should be inspected as soon as possible. You should keep a record of all maintenance and inspections carried out.

The record of inspection should include the following:

1. The name and address of the person for whom the inspection was carried out;
2. The location of the ladder;
3. A description of the ladder (type and identification);
4. Date and time of the inspection;
5. Details of anything that may be a risk to any employee;
6. Details of any action taken;
7. Details of any further action considered necessary;
8. The name and position of the person making the report.

<u>Requirements of BS EN 131-3: 2007 Ladders: Part 3-Users Instructions</u>

Before use:
a) Ensure that you are fit enough to use a ladder. Certain medical conditions or medication, alcohol or drug abuse could make ladder use unsafe;
b) when transporting ladders on roof bars or in a truck, ensure they are suitably placed to prevent damage;
c) inspect the ladder after delivery and before first use to confirm condition and operation of all parts;
d) visually check the ladder is not damaged and is safe to use at the start of each working day when the ladder is to be used;
e) for professional users regular periodic inspection is required;
f) ensure the ladder is suitable for the task;
g) do not use a damaged ladder;
h) remove any contamination from the ladder, such as wet paint, mud, oil or snow;
i) before using a ladder at work a risk assessment should be carried out respecting the legislation in the country of use.

Repair, maintenance and storage
Repairs and maintenance shall be carried out by a competent person and be in accordance with the producer's instructions.

Personal Fall Protection Equipment

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- BS 8437:2005 Code of practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace.
- BS EN 365:2004 Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging.
- Inspecting fall arrest equipment made from webbing or rope, The Health and Safety Executive, UK.

Requirements of the Safety, Health and Welfare at Work (General Application) Regulations, 2007

"Personal Fall Protection System" means;

a) a fall prevention, work restraint, work positioning, fall arrest or rescue system, other than a system in which the only safeguards are collective safeguards, or;

b) rope access and positioning techniques;

Personal fall protection systems should be inspected at suitable intervals where they are exposed to conditions causing deterioration liable to result in danger. Where exceptional circumstances have occurred that are liable to jeopardise the safety of the work equipment it should be inspected as soon as possible following these circumstances.

Requirements of BS 8437:2005 Code of practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace

Prior to Use

It is essential that all load-bearing equipment is given a visual and tactile inspection before each use to ensure that it is in a safe condition and operates correctly. Advice should be obtained from the manufacturer on how to do this, and this advice should be strictly followed.

6-Monthly

Formal inspection procedures should be put in place by employers to ensure that personal fall protection equipment is given a detailed inspection ("thorough examination") by a competent person before first use and at intervals not exceeding six months (or three months where the equipment is used in arduous conditions), and after circumstances liable to jeopardize safety have occurred.

It is essential that the person carrying out a thorough examination is sufficiently independent and impartial to allow objective decisions to be made, i.e. they have appropriate and genuine authority to discard equipment. This does not mean that competent persons necessarily have to be employed from an external company.

Interim inspections
It is recommended that interim inspections of personal fall protection equipment are carried out over and above the pre-use checks and the detailed inspections, at intervals determined by the risk assessment carried out at the beginning of the job. In determining what is a suitable interval, factors such as whether items are subject to high levels of wear and tear or contamination should be considered.

Both the detailed inspections and the interim inspections should be recorded.

Information on inspection, care and maintenance of personal fall protection equipment should be obtained from the manufacturer and this should be strictly followed. For an equipment inspection checklist see Annex C of the Code of Practice.

Lifespan
Some equipment is given a lifespan or obsolescence date by the manufacturer. Equipment that has reached such a limit, which has not already been rejected for other reasons, should be withdrawn from service and not used again, unless or until confirmed by a competent person, in writing, that it is acceptable to do so.

Textile equipment (anchor lines, lanyards, harnesses etc.)
It is important that components made from textile ropes and webbing are carefully checked, both before being stored and before being taken back into use, by being run through the hands to combine a visual and tactile examination. Kernmantel ropes should be examined visually to check that the sheath has not been cut and by feeling the rope for any damage to the core. Cable-laid ropes should be carefully twisted open at intervals along their length to inspect for internal damage. Harnesses and webbing should be checked for cuts, abrasions, broken stitches and undue stretching.

Metal equipment (connectors, anchor line devices etc.)
Metal equipment should be handled with care as it can be damaged if dropped. Metal items such as connectors, anchor line devices, buckles on harnesses, descending and ascending devices and retractable type fall arresters require checking to ensure that they function correctly and smoothly, that bolts and rivets are tight and to look for signs of wear, cracks, deformation, corrosion or other damage. They should be kept clean and in particular the mechanisms should be kept free from dirt, which could otherwise impair their functioning. When dry, moving parts should be lubricated using a light oil or silicone grease. Lubrication should be avoided in areas that might come into contact with webbing fastening straps (for example the slide bar of a harness buckle), anchor lines, lanyards, etc. because it could affect the proper functioning

Protective helmets
The shells of protective helmets should be checked for cracks, deformation, heavy abrasion, scoring or other damage. The chin straps and cradles should be checked for wear, as should the security of any attachment points between different elements, such as sewn or riveted areas. Any helmet showing any defect should be taken out of service.

Requirements of the BS EN 365:2004 Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging

This document specifies the minimum general requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging of PPE, which includes body holding devices, and other equipment used in conjunction with a body holding device, to prevent falls, for access, egress and work positioning, to arrest falls and for rescue

Manufacturers should supply instructions for periodic examinations including:

- **a)** warning to emphasize the need for regular periodic examinations, and that the safety of users depends upon the continued efficiency and durability of the equipment recommendation in regard to the frequency of periodic examinations, taking account of such factors as legislation, equipment type, frequency of use, and environmental conditions. The recommendation shall include a statement to the effect that the periodic examination frequency shall be at least every 12 months;
- **b)** warning to emphasize that periodic examinations are only to be conducted by a competent person for periodic examination and strictly in accordance with the manufacturer's periodic examination procedures;
- **c)** where deemed necessary by the manufacturer, e.g. due to the complexity or innovation of the equipment, or where safety critical knowledge is needed in the dismantling, reassembly, or assessment of the equipment, (e.g. a retractable type fall arrester), an instruction specifying that periodic examinations shall only be conducted by the manufacturer or by a person or organisation authorised by the manufacturer;
- **d)** requirement to check the legibility of the product markings.

Records

Advice shall be given that a record is kept for each component, subsystem and system. The record should contain headings for and spaces to allow entry of the following details:

- **a)** product, (e.g. full body harness), model and type/identification and its trade name;
- **b)** name and contact details of the manufacturer or supplier;
- **c)** means of identification, which could be the batch or serial number;
- **d)** where applicable, the year of manufacture or life expiry date;
- **e)** date of purchase;
- **f)** any other information as necessary, e.g. maintenance and frequency of use;
- **g)** date first put into use;
- **h)** history of periodic examinations and repairs, to include:
    1. dates and details of each periodic examination and repair, and the name and signature of the;
    2. competent person who carried out the periodic examination or repair;
    3. next due date for periodic examination.

Periodic examination

Manufacturers shall provide all the necessary information and equipment e.g. instructions, checklists, spare parts lists and special tools etc, to enable periodic examinations to be carried out by a competent person.

Requirements of the inspecting fall arrest equipment made from webbing or rope, The Health and Safety Executive

Lanyards should be subject to:

Pre-use checks
These checks are essential and should be carried out each time, before the lanyard is used. Pre-use checks should be tactile and visual. The whole lanyard should be subject to the check, by passing it slowly through the hands (e.g. to detect small cuts of 1 mm in the edges, softening or hardening of fibres, ingress of contaminants). A visual check should be undertaken in good light and will normally take a few minutes.

Detailed inspections
These more formal, in-depth inspections should be carried out periodically at minimum intervals specified in the employer's inspection regime. It is recommended that there is a detailed inspection at least every six months. For frequently used lanyards it is suggested that this is increased to at least every three months, particularly when the equipment is used in arduous environments (e.g. demolition, steel erection, scaffolding, steel skeletal masts/towers with edges and protrusions). Detailed inspections should be recorded.

Interim inspections
The need for and frequency of interim inspections will depend on use. Examples of situations where they may be appropriate include:

- risks from transient arduous working environments involving paints, chemicals or grit blasting operations;
- acidic or alkaline environments if the type of fabric the lanyard is made from cannot be determined (some fabrics offer low resistance to acids or alkalis).

Lanyards should be withdrawn from use and passed to a competent person for a detailed inspection to decide whether they should continue to be used, destroyed or returned to the manufacturer for testing to enable a product performance history to be determined, if:

- there is no evidence that a lanyard has been inspected by a competent person within the last six months;
- identification is not evident (lanyards should be indelibly and permanently marked in accordance with BS EN 365:2004. They should be uniquely identifiable so that they can be easily associated with their respective inspection documentation);
- a lanyard is still in use and marked to the old British Standard BS 1397:1979 Specification for industrial safety belts, harnesses and safety lanyards (i.e. pre CE-marking);
- a lanyard is thought to be defective, or if there is any doubt about its safety after a pre-use check or interim inspection.

A lanyard that has been used to arrest a fall should never be reused. It should be withdrawn from service immediately and destroyed or returned to the manufacturer.

X-Ray Units

Applicable S.I / Code of Practice/Standards:

- Radiological Protection Act, 1991 (General Control of Radioactive Substances, Nuclear Devices and Irradiating Apparatus) Order, 1993
- Radiological Protection Act, 1991 (Ionising Radiation) Order, 2000 (S.I. No. 125 of 2000)

The Radiological Protection Act, 1991 (General Control of Radioactive Substances, Nuclear Devices and Irradiating Apparatus) Order, 1993 prohibits activities involving exposure to ionising radiation except under license issued by the RPII.

Users of X-ray units which are licensed by the RPII must abide by the licence conditions attached to their Licence and to relevant radiation protection legislation (Radiological Protection Act, Ionising Radiation Order, 2000 (SI 125 of 2000)).

One licence condition states that "the licensed item shall be checked for correct operation and shall be serviced and maintained at **least every 12 months** or more frequently, depending on use, by suitably trained and competent persons in accordance with the manufacturer's instructions." This ensures that the unit is serviced and maintained on a regular basis.

On average the RPII inspects users of cabinet x-ray units every 4 years. Such inspections focus on the user's compliance with licence conditions and legislation and the assessment of overall radiological good practice. [3]

[3] Based on information obtained from the Radiological Protection Institute of Ireland

Dental X-Ray Equipment

Applicable S.I / Code of Practice/Standards:

- Code of Practice for Radiological Protection in Dentistry - RPII - 96/2
- Radiological Protection Act, 1991 (General Control of Radioactive Substances, Nuclear Devices and Irradiating Apparatus) Order, 1993

Requirements of Radiological Protection Act, 1991 (General Control of Radioactive Substances, Nuclear Devices and Irradiating Apparatus) Order, 1993

This order prohibits activities involving exposure to ionising radiation except under license issued by the RPII. Under this legislation a licence for the custody of dental radiographic equipment must be obtained from the RPII. This should be applied for at least 28 days before starting work with equipment. All radiographic exposures shall be clinically justified and kept as low as reasonably achievable. The dentist must ensure that all radiographic equipment under his/her responsibility conforms to the standards outlined in the Code of Practice for Radiological Protection in Dentistry.

Requirements of Code of Practice for Radiological Protection in Dentistry - RPII - 96/2

The Code of Practice for Radiological Protection in Dentistry deals with the use of X-rays in dentistry and states that all X-ray apparatus shall be maintained serviced and have its performance checked **annually** by suitably qualified and competent persons.

A full Quality Assurance inspection to insure compliance with requirements of the code (Detailed in the code in Appendix 2 - Criteria for the Acceptability of X-Ray Equipment in Dentistry) as well as an assessment of electrical and mechanical safety shall be carried out on all new equipment, and **every two years** thereafter, by a competent expert. The expert shall be independent of the supplying company. The frequency of inspection may be altered with expert advice. Particular attention shall be paid to old equipment.

The user shall keep a record of the dates and results of all checks and servicing. The RPII may require objective evidence that performance checks and servicing have been carried out before issuing or renewing a license.

Forklifts

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations, 2007

Forklift trucks including their interchangeable accessories are subject to a thorough examination[4] every 12 months and after 6 months if equipped or adapted for lifting persons.

The Health and Safety Authority[5] advise a system should be established for reporting defects and ensuring that remedial work is carried out. A planned routine maintenance system should include:

- Daily checks of tyres, brakes, reversing alarm, flashing beacon, etc. by the driver at the beginning of each shift;
- In-depth weekly checks by the supervisor/manager; these reports should be written and kept on record;
- Maintenance as per the manufacturer's instructions;
- Checks by a competent engineer following any major repair, modification or accident.

[4] The regulations state a thorough examination includes testing if a competent person considers it necessary for the purpose of the examination or testing required pursuant to Regulation 52 and Schedule 1 of the regulations. The reports of all examinations should be in the form prescribed in the regulations (see Appendix 1)

[5] Extract from "Forklift Trucks - FAQ's" available on: http://www.hsa.ie/publisher/index.jsp?aID=1571&nID=97&pID=93 (accessed on 02/07/2007)

Lifting Accessories /Lifting Equipment

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007

"Lifting equipment" means work equipment for lifting, lowering loads or pile driving, and includes anything used for anchoring, fixing or supporting such equipment.

Lifting equipment used on a construction site should be examined **weekly** by the user as regards features related to its safe working and a record of the results is kept in a suitable form which is kept available for inspection by an inspector for 3 months from the date of examination.

Items provided for support of lifting equipment and lifting machines used for materials only should be thoroughly examined once in **every 12 months.**

Fixed work equipment for lifting loads, including rail mounted work equipment for lifting loads, should not be taken into use for the first time unless;

(a) It has been tested and thoroughly examined by a competent person, and;
(b) A certificate of test and examination specifying the safe working load and, if appropriate, the maximum numbers of persons permitted has been obtained.

Mobile work equipment for lifting loads should not be taken into use in any place of work for the first time unless:

(a) It has been examined and certified in accordance with the General Application Regulations, or;

(b) It is a new machine which

(i) Is CE marked in accordance with the relevant directives of the European Communities;
(ii) Is accompanied by an EC declaration of conformity in accordance with the relevant directives of the European Communities;
(iii) Is accompanied by a certificate of test and examination for that machine signed by the person making the test, specifying the safe working load and;
(iv) Has not been reassembled since dispatch from the manufacturer.

"Lifting accessories" include clamps and similar attachments, chain slings, rope slings, rings, hooks, shackles, swivels, spreader beams, spreader frames and any other item placed between lifting equipment and the load or on the load in order to attach it, but excluding features of the load used for its lifting.

Lifting accessories and lifting machines (personnel) are subject to a thorough examination once in every 6 months.

In addition the General Application Regulations specify that where any alteration or repair is carried out to lifting equipment or a lifting accessory, and the alterations or repairs are relevant to the safe operation of the equipment, the equipment should be examined by a competent person before the equipment's return to service.

A report containing details required under Schedule 1 to regulations of the results of every examination should be produced (See Appendix 1). If such a report specifies conditions for safe working of the equipment these should be adhered to.

Employers should ensure that copies of the reports of every examination are kept at the place of work where the lifting equipment is permanently located. For mobile equipment reports should be kept available for inspection at the address of the owner.

A register of lifting equipment and lifting accessories containing details of the equipment, distinguishing number, date of first use and of last thorough examination and testing should be prepared, updated as necessary and kept available for possible HSA inspections. Where equipment does not have a distinguishing mark one should be provided.

Steam Boilers

Applicable S.I / Code of Practice/Standards:

- Factories Act, 1955: Section 40 (amended by The Safety in industry Act, 1980).
- The Factories (Preparation of Steam Boilers for Examination) Regulations, 1956.
- Factories (Report of Examination of Steam Boilers) Regulations (amended by SI 359/79).

Section 40 of The Factories Act states every steam boiler and all its fittings and attachments shall be thoroughly examined by a competent person at least once in every period of fourteen months, and also after any extensive repairs.

The Factories (Preparation of Steam Boilers for Examination) Regulations, 1956 and Factories (Report of Examination of Steam Boilers) Regulations (amended by SI 359/79) provide further requirements for examination of steam boilers and the writing of reports of examinations.

Steam Receivers

Applicable S.I / Code of Practice/Standards:

- Factories Act 1955, Section 41 (amended by The Safety in Industry, Act: section 32).
- Factories (Report of Examination of Steam Receivers) Regulations 1956.
- Factories (Report of Examination of Steam Receivers) Regulations 1956 (Amended by SI 356/ 1978).

According to the Factories Act 1955, Section 41 every steam receiver should be thoroughly examined, so far as the construction of the receiver permits, at least once in every period of twenty-six months.

Factories (Report of Examination of Steam Receivers) Regulations 1956 and Factories (Report of Examination of Steam Receivers) Regulations 1956 (Amended by SI 356/ 1978) contain information on required reporting procedures.

Air Receivers

Applicable S.I / Code of Practice/Standards:

- Factories Act 1955, Section 42 (amended by The Safety In Industry Act, 1980, Section 33).
- Factories (Report of Examination of Air Receivers) Regulations 1956.

To fulfil the requirements of The Factories Act, 1955 (Section 42) every air receiver shall be thoroughly cleaned and examined at least once in every period of twenty-six months, but in the case of a receiver of solid drawn construction—

(a) The person making any such examination may specify in writing a period exceeding twenty-six months but not exceeding four years within which the next examination is to be made, and;

(b) If it is so constructed that the internal surface cannot be thoroughly examined, a suitable hydraulic test of the receiver shall be carried out in lieu of internal examination.

Factories (Report of Examination of Air Receivers) Regulations 1956 specifies the format the report of the examination should take.

Vehicle Lifting Tables (BSD)

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations, 2007.

Should undergo a thorough examination once every 12 months according to the requirements of the regulations.

A report containing details required under Schedule 1 to regulations of the results of every such examination should be produced. (See Appendix 1)

Fire Hydrants

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.
- BS 9990:2006 Code of practice for non-automatic fire-fighting systems in buildings.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;

b) serviced by a competent person as frequently as necessary.

Requirements of BS 9999:2008

According to BS 9999-2008 all fire hydrants should be inspected once a week. In particular, it should be ensured that there are no obstructions impeding access, that the indicator plates are in position, and that the isolating valves are locked open. This standard also recommends annual checks but does not specify content or responsible party.

Requirements of BS 9990:2006

According to BS 9900 arrangements should be made by the owners or the occupiers to ensure that, at least once a year, a competent person carries out maintenance on all private fire hydrants. In most cases these arrangements, subject to suitable financial provisions, can be made with the local water undertaking (local authority in this case) or the fire authority. The former might also be prepared to carry out any necessary repair work.

Periodical inspections of the vicinity of all hydrants should also be made to ensure that there are no obstructions impeding accessibility and that hydrant indicator plates are in position. Periodical inspection should be made to ensure that all isolating valves for systems are kept locked in an open position. Also flow and pressure should be checked to ensure that supplies have not deteriorated.

If possible the local authority or Chief Fire Officer should be consulted on any inspection schedules.

Fire Extinguishers

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- I.S. 291:2002 - The Use, Siting, Inspection and Maintenance of Portable Fire Extinguishers.
- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

Fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;

b) serviced by a competent person as frequently as necessary.

Requirements of BS 9999:2008

All points where fire extinguishers are located should be inspected daily. Missing fire extinguishers should be replaced immediately and if used in a fire, training or otherwise should be recharged immediately. Damaged extinguishers or hose reels should be replaced/repaired.

Requirements of IS 291:2002

IS 291:2002 covers the use and suitability, siting, inspection and maintenance of portable fire extinguishers of the types which conform to European Standard EN 3 (which deals with portable fire extinguishers) as listed below:

- Water type extinguishers;
- Foam type extinguishers;
- Powder type extinguishers;
- Carbon dioxide type extinguishers;
- Halogenated hydrocarbon type extinguishers (Halon Extinguishers).

This Specification does not cover aerosol type extinguishers, disposable extinguishers, obsolete extinguishers such as soda acid or chemical foams, or extinguishers operated by inversion. It is recommended in the standard that these extinguishers should be withdrawn from service.

Checks for Halon Fire Extinguishers have not been included in this text as the permissible use of halon extinguishers is restricted. Regulation (EC) No. 2037/2000 requires that after 31 December 2002 the use of non-critical halon fire extinguishers is banned and that non-critical halon fire extinguishing equipment should have been decommissioned before 31 December 2003.

I.S. 291:2000 states that inspection of extinguishers shall be carried out at monthly and annually intervals by the user, or agent appointed by the user, supplier, or a competent

extinguisher maintenance agent. More frequent inspection may be necessary in the following cases:

(a) High frequency of outbreaks of fires;
(b) Severe hazard;
(c) Susceptibility to tampering, damage, vandalism or malicious mischief;
(d) Locations, which make extinguishers susceptible to mechanical injury such as exposure to abnormal temperatures, corrosive atmospheres or physical obstructions.
(e)

Monthly Routine for Fire Extinguishers

The monthly inspection procedure shall determine that:

(a) The extinguisher is in its designated place;
(b) Access to or visibility of the extinguisher is not obstructed;
(c) Any seals or indicator tabs are not broken;
(d) Pressure indicators, where fitted, show the correct pressure;
(e) The extinguisher has not been damaged;
(f) The extinguisher does not have obvious defects such as a clogged nozzle, corrosion, leakage or a loose or damaged hose;
(g) In the case of all carbon dioxide gas extinguishers the discharge horn or hose/horn is properly secured;
(h) The maintenance record label is properly attached to the extinguisher and is up to date and the maintenance register is entered up to date;
(i) A service certificate should be issued for record purposes.

Where an inspection reveals that interference has occurred or that the extinguisher is impaired in any way then arrangements shall be made immediately for the extinguisher to undergo maintenance.

If any extinguisher is found to be damaged, corroded or otherwise defective in the course of an inspection, arrangements shall be made immediately for it to be subjected to maintenance or to be replaced.

Annual Routine for Fire Extinguishers

A more through examination of the extinguisher must take place annually. This should involve opening the appliance, examining the body shell internally and externally and examining all parts and replacing any defective parts leaving the extinguisher ready for use. This Maintenance should be carried out by a competent, trained person who is familiar with the equipment and with any special procedure recommended by the manufacturer. The requirements for these examinations for each class of extinguisher are outlined in detail in Appendix 2.

Fire Hose Reels

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- BS 5306-1:2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets.
- IS EN 671-3:2000 Fixed firefighting systems: hose systems maintenance of hose reels with semi-rigid hose and hose systems with lay-flat hose**.**
- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

Fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;

b) serviced by a competent person as frequently as necessary.

Requirements of BS 5306-1:2006

The maintenance and testing of hose reels should be in accordance with BS EN 671-3.

If booster pumps have been installed these and their associated mechanical and electrical equipment should also be checked.

Requirements of BS 9999-2008

All points where hose reels are located should be inspected daily. Damaged hose reels should be replaced/repaired.

In addition hose reels should be visually inspected once a month. In particular, it should be ensured that there are no leaks and that the drum assemblies are free to rotate on their spindles.

Requirements of IS EN 671-3:2000

According to IS EN 671-3 regular checks of all hose reels and hose systems should be carried out by an appointed person or his representative at intervals depending on environmental circumstances and/or fire risk/hazard, to make sure that each hose reel or hose system is:

- Located in the designated place;
- Unobstructed, visible and has legible operating instructions;
- Not obviously defective, corroded or leaking.

The nominated person should arrange for immediate corrective action, where necessary.

Annual Routine for Fire Hose Reels

During this inspection the hose should be fully run out, put under pressure and the following points checked:

- **(a)** The appliance is unobstructed and free from damage and components not corroded or leaking;
- **(b)** Operating instructions are clear and legible;
- **(c)** The location is clearly marked;
- **(d)** Brackets for wall mounting are suitable for their purpose and are fixed and firm;
- **(e)** The flow of water is steady and sufficient (the use of flow indicator and pressure gauge is recommended);
- **(f)** Pressure gauge (if fitted) is working satisfactorily and within its operating range;
- **(g)** The entire length of hose should be inspected for signs of cracking, distortion, wear or damage. If the hose shows any signs of defect it shall be replaced or proof tested to maximum permissible working pressure;
- **(h)** Hose clips or bindings are of the correct type and are securely fastened;
- **(i)** Hose drums rotates freely in both directions;
- **(j)** For swinging reels, check that the pivot rotates easily and that the reel swings through 180°;
- **(k)** On manual reels, check the stop valve is of correct type and that it operates easily and correctly;
- **(l)** On automatic reels, check the correct operation of the automatic valve and check for the correct operation of the isolating service valve;
- **(m)** Check the condition of the water supply pipework, particular attention should be paid to any flexible pipework for signs of damage or wear;
- **(n)** If fitted with a cabinet, check for signs of damage and check that the cabinet doors open freely;
- **(o)** Check that the nozzle is of the correct type and easy to operate;
- **(p)** Check the operation of any hose guide and ensure they are correctly and firmly fixed;
- **(q)** Leave the hose reel and hose system ready for immediate use. If any extensive maintenance is necessary the hose reel or hose system should be labeled OUT OF ORDER and the competent person should inform the user/owner.

Five Yearly Routine

Every 5 years all hoses should be pressurized to maximum working pressure[6] according to IS EN 671-1 Fixed firefighting systems: hose systems hose systems with semi-rigid hose (0,7 – 1,2 Mpa depending on diameter of hose) and/or IS EN 671-2 Fixed firefighting systems: hose systems hose systems lay-flat hose (1,2 Mpa), depending on the type of hose in question.

After inspection and necessary corrective measures hose reels and hose systems should be marked **CHECKED** and a permanent record of all inspections, checks and tests maintained.

In order to check conformity with the manufacturer's instructions of the hose reel or hose system installation, records of a plan showing the exact location and technical data of the installation should be maintained on site.

[6] In standards discussed pressure given as MegaPascals, 1 Mpa = 10 bar.

Sprinkler Systems

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- IS EN 12845:2004. Fixed firefighting systems: automatic sprinkler systems: design, installation and maintenance.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

Fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;

b) serviced by a competent person as frequently as necessary.

Requirements of IS EN 12845:2004

Sprinkler systems incorporates the entire means of providing sprinkler protection in the premises comprising one or more sprinkler installations, the pipework to the installations and the water supply/supplies

An automatic sprinkler system is designed to detect a fire and extinguish it with water in its early stages or hold the fire in check so that extinguishment can be completed by other means.

It is specified that a programme of inspection and checks, tests, service and maintenance should be implemented and records of these kept including a logbook, which shall be held on the premises.

The installer should provide a documented inspection and checking procedure for the system. This should include instruction on the action to be taken in respect of faults, operation of the system, with particular mention of the procedure for emergency manual starting of pumps, and details of the weekly routine.

Other than the weekly inspection tests, service and maintenance should be carried out under contract by the system installer or a similarly qualified company. After an inspection, check, test, service or maintenance procedure the system, and any automatic pumps, pressure tanks and gravity tanks shall be returned to the proper operational condition.

Weekly Routine for Sprinkler Systems.

The following shall be checked and recorded weekly:

- **(a)** All water and air pressure gauge readings on installations, trunk mains and pressure tanks;
- **(b)** All water levels in elevated private reservoirs, rivers, canals, lakes, water storage tanks (including pump priming water tanks and pressure tanks);
- **(c)** The correct position of all main stop valves;
- **(d)** Each water motor alarm shall be sounded for no less than 30 s;
- **(e)** Automatic pump starting test - Tests on automatic pumps shall include the following;
    - Fuel and engine lubricating oil levels in diesel engines shall be checked;
    - Water pressure on the starting device shall be reduced, thus simulating the condition of automatic starting;
    - When the pump starts, the starting pressure shall be checked and recorded;
    - The oil pressure on diesel pumps shall be checked, as well as the flow of cooling water through open circuit cooling systems.
- **(f)** Diesel engine restarting test **-** Immediately after the pump start test diesel engines shall be tested as follows:
    - The engine shall be run for 20 min, or for the time recommended by the supplier. The engine shall then be stopped and immediately restarted using the manual start test button;
    - The water level in the primary circuit of closed circuit cooling systems shall be checked;
    - Oil pressure (where gauges are fitted), engine temperatures and coolant flow shall be monitored throughout the test. Oil hoses shall be checked and a general inspection made for leakage of fuel, coolant or exhaust fumes.
- **(g)** Trace heating and localized heating systems **-** Heating systems to prevent freezing in the sprinkler system shall be checked for correct function.

Monthly Routine for Sprinkler Systems.

The electrolyte level and density of all lead acid cells (including diesel engine starter batteries and those for control panel power supplies) shall be checked. If the density is low the battery charger shall be checked and, if this is working normally, the battery or batteries affected shall be replaced.

Any procedures recommended by component suppliers shall be carried out.

A signed, dated report of the inspection shall be provided to the user and shall include advice of any rectification carried out or needed, and details of any external factors, e.g. weather conditions, which may have affected the results.

Quarterly Routine for Sprinkler Systems.

The following checks and inspections shall be made at intervals of no more than 13 weeks.

(a) Review of hazard;

The effect of any changes of structure, occupancy, storage configuration, heating, lighting or equipment etc. of a building on hazard classification or installation design shall be identified in order that the appropriate modifications may be carried out.

(b) Sprinklers, multiple controls and sprayers;

- Sprinklers, multiple controls and sprayers affected by deposits (other than paint) shall be carefully cleaned;
- Painted or distorted sprinkler heads, multiple controls or sprayers shall be replaced;
- Any petroleum jelly coatings shall be checked;
- Where necessary the existing coatings shall be removed and the sprinklers, multiple controls or sprayers shall be coated twice with petroleum jelly (in the case of glass bulb sprinklers to the sprinkler body and yoke only);
- Particular attention shall be paid to sprinklers in spray booths, where more frequent cleaning and/or protective measures may be necessary.

(c) Pipework and pipe supports

- Pipework and hangers shall be checked for corrosion and painted as necessary;
- Bitumen-based paint on pipework, including the threaded ends of galvanized pipework and hangers, shall be renewed as necessary. Bitumen-based paint may need renewal at intervals varying from 1 to 5 years according to the severity of the condition;
- Tape wrapping on pipes shall be repaired as necessary;
- The pipework shall be checked for electrical earthing connections. Sprinkler pipework shall not be used for earthing electrical equipment and any earthing connections from electrical equipment shall be removed and alternative arrangements made.

(d) Electrical supplies;

Any secondary electrical supplies from diesel generators shall be checked for satisfactory operation.

(e) Water supplies and their alarms;

Each water supply shall be tested with each control valve set in the system. The pump(s), if fitted, in the supply shall start automatically and the supply pressure at the appropriate flow rate shall be no less than the appropriate value.

(f) Stop valves;

All stop valves controlling the flow of water to sprinklers shall be operated to ensure that they are in working order, and securely refastened in the correct mode. This shall include the stop valves on all water supplies, at the alarm valve(s) and all zone or other subsidiary stop valves.

(g) Flow switches;
Flow switches shall be checked for correct function.

(h) Replacement;
The number and condition of replacement parts held as spare shall be checked.

Half-Yearly Routine for Sprinkler Systems.

The following checks and inspections shall be made at intervals of no more than 6 months.

(a) Dry alarm valves;
The moving parts of dry alarm valves, and any accelerators and exhausters, in dry pipe installations and subsidiary extensions shall be exercised in accordance with the supplier's instructions. Alternate installations need not be tested in this way since they are exercised twice a year as a result of the changeover from wet to dry operation and back.

(b) Fire brigade and remote central station alarm - the electrical installation shall be checked.

Yearly Routine for Sprinkler Systems.
The following checks and inspection shall be made at intervals of no more than 12 months.

(a) Automatic pump flow test;
Each water supply pump in the installation shall be tested at the full load condition (by means of the test line connection coupled to the pump delivery branch downstream of the pump outlet non-return valve) and shall give the pressure/flow values stated on the nameplate. Appropriate allowances shall be made for pressure losses in the supply pipe and valves between the source and each control valve set.

(b) Diesel engine failed-to-start test;
The failed-to-start alarm shall be tested this involves The automatic starting sequence shall make six attempts to start the engine, each one of 5 s to 10 s duration, with a maximum pause of 10 s between each attempt. The starting device shall reset itself automatically. It shall function independently of the line power supply. The system shall switch over automatically to the other battery after each starting attempt. The control voltage shall be drawn from both batteries simultaneously. Facilities shall be provided to prevent one battery having an adverse effect on the other. Immediately after this test the engine shall be started using the manual starting system.

(c) Float valves on water storage tanks;
Float valves on water storage tanks shall be checked to ensure they function correctly.

(d) Pump suction chambers and strainers;
Pump suction strainers and settling chamber and their screens shall be inspected at least annually and cleaned as necessary.

3- Yearly Routine for Sprinkler Systems.

The following checks and inspections shall be made at intervals of no more than 3 years.

(e) Storage and pressure tanks;
All tanks shall be examined externally for corrosion. They shall be drained, cleaned as necessary and examined internally for corrosion. All tanks shall be repainted and/or have the corrosion protection refurbished, as necessary.

(f) Water supply stop valves, alarm and non-return valves;
All water supply stop valves, alarm and non-return valves shall be examined and replaced or overhauled as necessary.

10 Yearly Routine for Sprinkler Systems.

At no more than 10-year intervals, all storage tanks shall be cleaned and examined internally and the fabric attended to as necessary.

Fire Detection and Alarm Systems

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- IS 3218:2009 Fire Detection and Alarm Systems for Buildings: System Design, Installation and Servicing.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and
b) serviced by a competent person as frequently as necessary.

Requirements of IS 3218:2009

To give greater assurance of reliability, correct servicing is essential. Normally an agreement should be made with a competent contractor or competent in-house resource for regular servicing. The agreement should specify the method of liaison to provide access to the premises. The name, telephone number and general contact details of the service provider shall be prominently displayed at the control and indicating equipment.

The responsible person shall satisfy themselves as to the competence of the appointed service provider who should be able to formally demonstrate competence to provide the service offered. This provider should be certified by a Certification Body that is accredited by a member of the European Cooperation of Accreditation (EA).

For all systems, maintenance facilities shall be available and accessible at all times, both during and outside normal working hours, and requests for emergency response should be executed promptly within defined response times. In any case, agreement should be made that maintenance services will be available within 24 h.

Servicing shall be undertaken following commissioning of the installation whether the premises are occupied or not. The requirement for servicing is a statutory requirement and independent of any obligations of the installer under defects liability.

A Certificate of Servicing/Testing shall be prominently displayed adjacent to the main control and indicating equipment to indicate the service provider, the service planning and confirming completion of the planned service in compliance with the requirements of this Standard. The service provider shall confirm that the system is in satisfactory working order

The code requires daily, weekly, quarterly and annual inspections on fire detection and alarm systems to be carried out.

Daily Routine for Fire Alarm and Detection Systems

A check shall be made every day to ascertain the following:

a) that either the panel indicates normal operation, or if not, that any fault indicated is recorded in the Log Book and that the other actions recommended below have been taken;

After a fault, the user should carry out the following:

1) determine the area affected by the fault and decide whether special action (such as fire patrols) are needed in that area,
2) if possible, determine the reason for the fault, or note the activities immediately prior to the fault in the area affected,
3) record the fault in the log book, inform the organisation responsible for servicing and arrange for testing and take further action as appropriate.

b) that any fault warning recorded the previous day has received attention.

If any connection to a remote manned centre is not continuously monitored then it should be tested daily in accordance with the supplier's instructions.

On one day each week the daily test will be incorporated in the weekly test.

In buildings not in continuous or daily occupation it may not be practicable to carry out the check every day. In such circumstances the check should be carried out on each occasion that the building is used.

Weekly Routine for Fire Alarm and Detection Systems

On one day each week the daily test will be incorporated in the weekly test which should also include the following tests to ensure that the system is capable of operating under alarm conditions:

a) at least one detector, call point or end of line switch on at least one zone[7] shall be operated to test the ability of the control and indicating equipment to receive a signal and to sound the alarm and operate any other warning devices.

For systems having 13 zones or less, each zone shall be tested in turn; if there are more than 13 zones then more than one zone shall be tested in any week so that the interval between tests on any one zone does not exceed 13 weeks.

It is preferable that each time a particular circuit is tested a different trigger device is used. An entry shall be made in the log book quoting the particular trigger device that has been used to initiate the test;

b) If operation of the alarm sounders has been prevented by disconnection then a further test shall be carried out to prove the final reinstatement of the sounders, and, if permissible, of the alarm transmission circuits;

c) A visual examination of the standby supply and its connections shall be made to ensure that they are in good condition. Action should be taken to remedy any defect, including low electrolyte level;

d) The fuel, oil and coolant levels of any standby generator shall be checked and topped up as necessary;

e) Any printer should be checked to ensure that its reserves of paper, ink or ribbon are adequate for at least 2 weeks normal usage;

All defects shall be recorded in the log book and reported to the responsible person who shall initiate whatever

Quarterly Routine for Fire Alarm and Detection Systems

The responsible person shall ensure that every 3 months the following checks are carried out by a competent person:

a) Entries in the log book shall be checked and any necessary action taken;

b) Where applicable, batteries should be examined to ensure that the specific gravity of electrolyte in each cell is correct. Any necessary remedial action shall be taken;

c) Batteries, including reserves, shall be tested as specified by the supplier to verify that they are satisfactory for a further period of use by taking measurements that are indicative of the conditions of each cell, by the use of a proprietary load test meter specific for the purpose.

[7] A section of the protected premises where the occurrence of a fire within it will be indicated by a fire alarm system separately from an indication of fire in any other section.

The test conditions and the significance of the readings will depend on the type of cell and the use to which it is being put. These should be clearly specified by the supplier or commissioning company and applied with care.

Batteries shall be replaced within the period of the service life stipulated by the battery manufacturer. These requirements need not be applied to batteries which power individual items of equipment (such as detectors or sounders) and which have provision for monitoring as required in 5.15.2.3;

d) The alarm functions of the control and indicating equipment shall be checked by the operation of a detector or call point in each zone as described in 8.2.2.4. The operation of the alarm devices and any link to an alarm receiving centre (ARC) shall be tested. All ancillary functions of the control panel shall also be tested where practicable. All fault indicators and their circuits shall be checked, preferably by simulation of fault conditions. The control and indicating equipment shall be visually inspected for signs of moisture ingress and other deterioration.

NOTE It is recommended that during the quarterly/periodic service a percentage of the detection devices be tested such that at the end of the annual period all devices have been tested. This will be deemed to satisfy the requirements of 8.2.2.6 b) provided that adequate records have been maintained to guarantee that 100 % of the devices have been suitably tested.

The operation of sounders/visual alarm indicator shall be checked such that at the end of the annual maintenance period 100 % of all devices have been tested;

e) A visual inspection shall be made to check whether structural or occupancy changes have affected the requirements for the siting of manual call points, detectors and sounders. The visual inspection shall also confirm that a clear space of at least 500 mm is preserved in all directions below and around every detector, that the detectors are sited in accordance with 5.10.3 and/or 5.10.4 and that all manual call points remain unobstructed and conspicuous;

f) All further checks and tests specified by the installer, supplier or manufacturer shall be carried out;

g) Particular attention should be made to areas where alterations to the system have been carried out since the last inspection.

Any defect shall be recorded in the log book and reported to the responsible person, and action should be taken to correct it on the instructions of the responsible person.

On completion of the work, a Certificate of Servicing/Testing shall be given to the responsible person. The certificate shall indicate its validity/expiry date (see Annex D 1 and Annex D 2).

For non-residential systems of two zones or less which incorporate a combination of less than 20 automatic detection devices or call points, then 3-monthly inspection may be extended to 6 months provided the user/responsible person has been adequately trained and can undertake items a), b) and d) above.

Annual Routine for Fire Alarm and Detection Systems

The responsible person shall ensure that the following check and test sequence is carried out every year by competent person:

a) the inspection and test routines detailed in the quarterly inspection;

b) each detector shall be checked for correct operation in accordance with the manufacturer's recommendations (see note below on detectors);

c) every manual call point shall be checked for correct operation by insertion of a test key or operation of the switch mechanism or other test which confirms the correct action of the switching mechanism and ability of the device to correctly communicate a fire signal to the control and indicating equipment.

The test shall also confirm the correct operation of any indicator device on the call point and that the response time is within the parameters set out in IS 3218:2009 (In general the delay between operation of a call point and the giving of an audible or visual confirmation shall not exceed 3 s., a delay of up to 10 s may be acceptable, subject to the agreement of the relevant enforcing authority and the recording of the delay as a variation on the Certificate of Completion);

d) a visual inspection (as far as is reasonably practical) shall be made to confirm that all cable fittings and equipment are secure, undamaged and adequately protected;

e) the required sound levels are achieved. It is strongly recommended that this be carried out in conjunction with the annual fire evacuation drill.

Any defect shall be recorded in the log book. These shall be reported to the responsible person for appropriate corrective action.

On completion of the work, a Certificate of Servicing/Testing (see Annex D 1 and Annex D 2 of IS 3218:2009) shall be given to the responsible person.

Note on Detectors:

It is essential that routine tests are adequate to ensure that the requisite degree of sensitivity to fire is maintained, and the responsible persons should satisfy themselves on this point. If it is found that the sensitivity of detectors is adversely affected by harsh environmental conditions, then arrangements should be made to increase the frequency of the inspections. Any detectors which have shown continued signs of instability should be replaced. All detectors should be visually examined for damage or other conditions, such as any coating of paint, likely to interfere with correct operation.

Heat detectors

Every heat detector, provided they are not of the type which requires replacement of the detector or any element of the detector following operation, shall be tested at least annually by the application of a suitable heat source.

Care should be taken to ensure that the heat source has been designed for the application and is not likely to damage any part of the detection device or be a cause of ignition of fire. Naked flames shall not be used.

Heat detectors which require replacement of the device or any element of the device following activation which cannot be tested by the application of a heat source should be tested at least annually in accordance with the manufacturers' instructions.

Point type smoke detector

Every detector shall be tested at least annually by a method which confirms that smoke can enter the detection chamber and activate the device. The product employed for the test of the detector (simulated smoke or aerosol) should be suitable for the application and should not cause damage to the device or impair its future detection ability.

Test products recommended by the manufacturer should be employed or the manufacturers' approval should be sought for the use of alternative products.

The use of magnets, remote switches, other electrical/electronic tests or interrogation of devices by software methods will not be acceptable.

Carbon Monoxide point detectors

Each detector shall be tested as per requirements for Point type smoke detector above but employing Carbon Monoxide in accordance with the manufacturers' recommended concentration as the test medium. Alternatively any test medium recommended by the manufacturer which can simulate the reaction of the cell to carbon monoxide may be employed provided it also correctly simulates the ability of the carbon monoxide to enter the detection chamber.

Multi-sensors

Each device shall be tested annually to confirm its correct operation. Testing should be undertaken in accordance with the manufacturers' instructions and each sensing element shall be confirmed as being responsive to the medium being sensed i.e. smoke sensor shall react to smoke, heat sensors to heat and carbon monoxide sensors to carbon monoxide.

In addition to the testing of the device it shall also be confirmed that where multi-sensors are applied to detect single phenomena (smoke, heat or carbon monoxide only) that the detector spacing and coverage complies with the spacing relevant to the fire phenomena.

Air sampling/aspirating systems

Each detector shall be tested annually in accordance with the manufacturers' instructions and by a method which confirms that smoke can enter the detection chamber and activate the device. Each device shall be tested to confirm that smoke entering the furthest sampling hole is sensed at the detection chamber.

The air flow monitoring capability of each device should also be confirmed by the restriction of the appropriate volume of air to trigger the flow monitoring circuit. The use

for which the device is being employed shall be considered and appropriate test procedures initiated.

- **Use as a point detector substitute -** Each sampling hole designed to represent a point detector shall be tested to ensure it is clear and that smoke entering the hole is sensed at the detection chamber.
- **Use for Equipment Protection -** Each device shall be tested by the application of smoke or simulated smoke into at least one sampling hole in each equipment enclosure.
- **Use in EDP or High sensitivity mode -** The guidelines as set out in BS 6266 shall be followed.

Beam Detectors

Linear beam detectors shall be tested at least annually in accordance with the manufacturers' instructions. Where optical filters are used to test the device the filter shall be of the correct obscuration for the particular device. Alternatively smoke or simulated smoke may be employed.

Flame detectors

The flame detector shall be checked for correct alignment for the hazard protected and tested in accordance with the manufacturers' instructions annually. Where UV or IR test torches are used they should match the detection characteristics of the sensor and in hazardous areas the test devices should also be suitably rated for the hazard area.

Other detectors

Detectors other than those listed above shall be checked for correct operation and sensitivity in accordance with the manufacturers' recommendations.

Remounted detectors

If detectors, sounders or alarm indicators are removed from their mounting or circuit for any test, then a final verification check shall be carried out for correct operation after remounting.

System disconnection during testing

Care should be taken to minimise disruption of the normal use of a building by alarms sounding during detector testing. It is preferable that during testing of detectors as much as possible of the remainder of the system should continue to function normally.

If detectors are removed from the system for testing or servicing, replacement detectors should be immediately provided to keep the system in normal operation, or separate provision should be made for surveillance of the unprotected area.

Systems using addressable detectors

Care should be taken during the servicing of systems in which the detector is itself coded. False information in respect of the origin of alarms could occur if individually coded detectors were incorrectly replaced.

Standby supply batteries

The test specified by the manufacturer under IS 3218:2009 shall be carried out at the intervals specified (a method of test likely to predict the failure of the battery in the interval between routine tests).

Further checks and inspections outside of routine are also necessary if:

Routine attention described is intended to maintain the system in operation under normal circumstances. There may, however, be special circumstances in which other attention is needed:

a) action by the user after any fire;
b) action by the user after any false alarm;
c) action by the user following a fault;
d) action by the user following a pre-alarm warning;
e) prolonged periods of disconnection;
f) other non-routine attention.

These checks must also be recorded and relevant action taken to remedy faults. The requirements for these checks are specified in IS 3218:2009.

Break Glass Units

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007.
- IS 3218:12009 Fire Detection and Alarm Systems for Buildings: System Design, Installation and Servicing**.**

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;
b) serviced by a competent person as frequently as necessary.

See requirements for manual call points (a component of a fire detection and fire alarm system which is used for the manual initiation of an alarm) as covered in IS 3218:2009 Fire Alarm and Detection Systems above.

Fire Mains (Wet and Dry Risers)

Applicable S.I / Code of Practice/Standards:

- Safety, Health and Welfare at Work (General Application) Regulations, 2007;
- BS 9999:2008 Code of practice for fire safety in the design, management and use of building;
- BS 9990:2006 Code of practice for non-automatic fire-fighting systems in buildings.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

Fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;
b) serviced by a competent person as frequently as necessary.

Requirements of BS 9990:2006

Dry fire mains

Inlets, landing valves, drain valves, door hinges and locking arrangements to the inlet and landing valve boxes should be inspected every **six months.** Special attention should be given to all valves, spindles, glands and washers to ensure that they are in satisfactory condition, so that all equipment is ready for immediate use.

In addition, it is recommended that wet tests be carried out **annually** when the main can be checked for leaks.

Wet fire mains - Maintenance of wet fire mains involves additional checks. These additional checks are:

a) check on the internal cleanliness of storage tanks;
b) thorough check of the booster pumps and their associated mechanical and electrical equipment.

Requirements of BS 9999:2008

Fire mains are defined in BS9999:2008 as a water supply pipe, fitted with an outlet and control valve at specified points, installed in a building for fire-fighting purposes.

All fire mains should be inspected every **six months**. In particular, it should be ensured that:

a) inlets, landing valves, drain valves, door hinges and locking arrangements for inlet and landing valve boxes are ready for immediate use, and spindles, glands and washers are in a satisfactory condition;

b) for wet mains:

1. booster pumps and their associated mechanical and electrical apparatus are functioning correctly;
2. storage tanks are full of clean water.

This standard also recommends **annual** checks but does not specify content or responsible party.

Fire Doors

Applicable S.I / Code of Practice/Standards:

- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings..
- Safety, Health and Welfare at Work (General Application) Regulations, 2007.

Requirements of Safety, Health and Welfare at Work (General Application) Regulations, 2007

fire detection equipment and fire-fighting equipment is:

a) inspected and maintained as frequently as necessary to ensure that it is in good working order, and;
b) serviced by a competent person as frequently as necessary.

Requirements of BS 9999:2008 - *6-Monthly Routine for Fire Doors:*

All fire doors should be inspected every six months. In particular, it should be ensured that:

a) heat-activated seals and smoke seals are undamaged;
b) door leaves are not structurally damaged or excessively bowed or deformed;
c) gaps between the door leaf and the frame are not so small as to be likely to bind, or so large as to prevent effective fire and smoke-sealing;
d) hanging devices, securing devices, self-closing devices and automatic release mechanisms are operating correctly.

Section 2

Inspections Required by Codes of Practice

Electric Power Generators

Applicable S.I / Code of Practice/Standards:

- IS 3218:2009 Fire Detection and Alarm Systems for Buildings: System Design, Installation and Servicing.
- I.S. 3217: 2008. Emergency Lighting.
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I.S. 3217: 2008 Emergency Lighting

Checks for generators used in Emergency Lighting are covered in relevant sections above.

IS 3218:2009 Fire Detection and Alarm Systems for Buildings: System Design, Installation and Servicing.

Checks for generators used in fire alarm and detection systems are covered in relevant sections above.

Residual Current Devices (RCD's)

Applicable S.I / Code of Practice/Standards:

- ET101: 2006 National Rules for Electrical Installations.
- ET214: 2005 Guide to the Selection & Use of Residual Current Devices (RCD's).
- Code of Practice for Preventing Injury and Occupational Ill Health in Agriculture, Health and Safety Authority.

ET214 recommends verifying operation of RCDS using the test button on the RCD at regular intervals such as every three months. The Code of Practice for Preventing Injury and Occupational Ill Health in Agriculture recommends RCD's be tested monthly by using the test trip button.

ET214 also states arrangements should be made for regular testing by application of an external residual current as specified in Annex 61f of ET101.

Annex 61f of ET101 deals with verification of operation of RCDS, and specifies that the operating characteristics of RCDS should be verified by injecting a test residual current and recording time of operation by means of an instrument specifically designed for the purpose. The values obtained should be in line with ET101 tables. These should be completed at regular intervals although no specific time frame mentioned.

Earth Loop Impedance System

Applicable S.I / Code of Practice/Standards:

ET101: 2006 National Rules for Electrical Installations

The fault loop impedance should be measured using a proprietary instrument with a facility for measuring low values of impedance.

The main protective conductor should be left in place. Measurements should be made as follows:

- At the location of the main fuse the instrument is connected between the phase conductor and the main earthing terminal;
- For a final circuit the instrument is connected at the furthest point of the circuit between the phase conductor and the corresponding point on the associated protective conductor e.g. at a socket outlet.

The maximum values of fault loop impedance for a range of fuses and mcbs (main circuit breakers) must not exceed values specified in Annex 61C of wiring rules. Formula for calculation of fault loop impedance is also provided in annex 61C.

Goalposts

Applicable S.I / Code of Practice/Standards:

I.S. 357:2007 Playing Field Equipment–Goals. Code of Practice on the Procurement, Installation, Maintenance Inspection and Storage.

Requirement of I.S. 357:2007

Goals should be inspected regularly to ensure they are safe for use – frequency of inspections should take account of conditions in which goal is kept. The standard states it may be necessary to inspect a goal installed in a public space everyday but less frequent inspections would be required for goals in a locked, fenced enclosure, used only by an organised club at high level. Level of usage should also be considered when developing inspection schedule.

If during any inspection the safety of the goals cannot be determined visually, either a load bearing strength test or stability test may be required. (Annex C of I.S. 357:2007 Code of Practice on the Procurement, Installation, Maintenance Inspection and Storage sets out the requirements and testing criteria). This test should be carried out by a competent person using suitable mechanical testing equipment. Users/owners should consult with their governing bodies/ management if mechanical testing is required.

Routine Visual Inspection

It is advised this is carried out at least once a week and/or before any game, training activity or event. This inspection is intended to enable the identification of obvious hazards that can result from vandalism, misuse or general deterioration. Typical hazards to consider include:

- Damage to the goalframe;
- Lack of / insufficient anchorage or stability equipment;
- Damaged or missing fixings;
- Damaged nets / damaged or missing net fixings.

Examples of visual inspection are stability, anchorage, excessive wear, structural integrity and alignment.

Operational inspection

Operational inspection should be carried out particularly when a goal has been moved from one location to another. Those who have responsibility for the movement of a goal should carry out this level of inspection. The operational inspection is a more detailed inspection taking into account routine visual inspection criteria and checks to verify the integrity of the components and assembly of the goal and in particular note any deterioration of same.

- Check that anchorage and stability equipment is properly attached to the goals;
- Check that manufacturers instructions are followed in relation to location of anchorage equipment and correct weights;

Annual main inspection

This inspection is carried out to establish the overall level of safety of goals.

- Should include routine visual inspection and operational inspection described above and;
- Foundations and surfaces, e.g. effects of weather, evidence of rotting or corrosion.

Competent persons should carry out this inspection of the goal in strict accordance with manufacturer's instructions. The level of competence required will vary with the task.

Section 3

Inspections covered in Standards

Emergency Lighting

Applicable S.I / Code of Practice/Standards:

- I.S. 3217: 2008 Emergency Lighting.
- I.S E.N. 62034:2007 Automatic Systems for Battery Powered Emergency Escape Lighting.
- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.

Requirements of BS 9999:2008:

It is advised the following be checked **daily**:

(a) Every lamp is lit if the system is maintained;
(b) The control panel for any central battery system or generator indicates normal operation;
(c) Any fault found is logged and the appropriate action(s) taken.

Requirements of I.S. 3217: 2008 Emergency Lighting

Owing to the possibility of a failure of the normal lighting supply occurring shortly after a period of testing of the emergency lighting system or during the subsequent recharge period, all tests shall be undertaken at a time of minimum risk. Alternatively, suitable temporary arrangements shall be made until the batteries have been charged.

Weekly Routine for Emergency Lighting

A test shall be made once every seven days to ascertain that:

a) A fault recorded in the log book has been given urgent attention and the action noted;
b) every lamp in a maintained system is lighting;
c) the main control or indicating panel of each central battery system indicates normal operation;
d) the main control or indicating panel of each engine driven generator plant indicates normal operation. After inspection the system shall be started and run to recharge the batteries, and to allow each luminaire to be checked for correct operation;
e) the LED in charging circuit is illuminated;
f) any fault found is recorded in the log book and the action taken and noted.

Quarterly Routine for Emergency Lighting

An inspection should be made quarterly in accordance with a systematic schedule. Tests should be carried out as follows:

a) Each self-contained luminaire and internally illuminated escape route sign shall be energized from its battery by simulation of a failure of the supply to the normal lighting for the required period set out below:

- functional test of 18 minutes maximum (ATS[8] only);
- functional test of 30 minutes (all test facilities except ATS);
- full duration test of 3 hours (all test facilities).

The time should not exceed one quarter of the rated duration of the luminaire or sign. During this period all luminaires and/or signs shall be examined visually to ensure that they are functioning correctly;

b) Each central battery system shall be energized from its battery by simulation of a failure of the supply to the normal lighting for a period of at least 30 min but not exceeding one quarter of the rated duration of the battery.

During this period all luminaires and/or signs shall be examined visually to ensure that they are functioning correctly. If it is not possible to examine visually all luminaires and/or signs in this period, further tests shall be made after the battery has been fully recharged.

The charging arrangements for the battery shall be checked for proper functioning after the test by current and voltage measurements;

c) Each engine-driven generating plant shall be started up by a simulation of a failure of the supply to the normal lighting and allowed to energize the emergency lighting system for a continuous period of at least 1 h.

During this time all luminaires and/or signs shall be examined visually to ensure that they are functioning correctly. At the end of the test period the system shall be restored to normal operation and the charging arrangements for the engine-starting battery shall be checked for proper functioning after the test by current and voltage measurements.

The fuel tanks shall be left filled and the oil and coolant levels topped up as necessary. The contents of the bulk tank, if provided, shall be noted;

d) Where back-up lighting batteries are used on an engine-driven generator system, the engine shall be prevented from starting. The emergency lighting system shall then be energized solely form the back-up battery by simulation of a failure of the supply to the normal lighting for a period of at least 30 min but not exceeding one quarter of the rated duration of the battery, in order to ensure that the changeover from normal supply to battery is functioning properly.

[8] **Automatic test system (ATS) -** automated test system that may be manually initiated, consisting of parts (such as timers, current detectors, light detectors, change over switches) which, when connected together, make a system that can carry out the routine testing requirements of emergency lighting luminaires, and indicate the test results

After this check the starting system engine shall be returned to normal operation and the engine allowed to start up in the normal way to energize the emergency lighting system for a continuous period of at least 1 h.

During these periods all luminaires and/or sign shall be examined visually to ensure that they are functioning correctly.

At the end of the test period the system shall be restored to normal operation and the charging arrangements for the back-up and the engine starting batteries checked for proper functioning.

The fuel tanks shall be left filled and the oil and coolant levels topped up as necessary. The contents of the bulk tank, if provided, shall be noted.

Annual Routine for Emergency Lighting:

The three-monthly test shall be carried out and the following additional tests made:

- **a)** each emergency lighting installation shall be tested and inspected to ascertain compliance with this Standard;
- **b)** each self-contained luminaire and/or internally illuminated sign shall be tested for its full duration;
- **c)** at the end of the test period the supply to the normal lighting shall be restored and any indicator lamp or device checked to ensure that it is showing that the normal supply has been restored;
- **d)** each central battery system shall be tested for its full duration;
- **e)** at the end of the test period the supply to the normal lighting shall be restored and any indicator lamp or device checked to ensure that it is showing that the normal supply has been restored, The charging arrangements shall be checked for proper functioning;
- **f)** each generator back-up battery, where fitted, shall be tested for its full duration,
- **g)** at the end of the test period the system shall be restored to normal operation and the charging arrangements for the back-up and engine-starting batteries checked for proper functioning. Any indicator lamp or device shall then be checked to ensure that it is showing that normal arrangements have been restored;
- **h)** The fuel tanks shall be left filled and the oil and coolant levels topped up as necessary.

Those conducting the annual test should supply a Periodic Inspection and Testing Certificate

4 Yearly Routine for Emergency Lighting:

Light level tests shall be carried out to confirm illumination levels

Unspecified intervals:

Central battery systems - In all cases the manufacturer's instructions shall be displayed in accordance with I.S. EN 50171:2001 and shall be carefully followed. It is particularly important that where applicable:

- **a)** the tops of batteries and their terminals are kept clean and unobstructed and that battery cases are periodically checked for leaks;
- **b)** the electrolyte is at all times kept at the correct level as recommended by the manufacturer;
- **c)** any replacement battery is compatible with the battery charger;
- **d)** any replacement cell is compatible with the battery;
- **e)** any replacement battery charger is compatible with the battery;
- **f)** the enclosure or space ventilation is checked for compliance with the manufacturer's instructions;
- **g)** the outgoing voltage is checked.

I.S. 3217: 2008. Emergency Lighting states for generators manufacturer's instructions as given in the associated instruction manual shall always be followed. Air intakes and exhausts shall be unobstructed and the system shall be adequately ventilated. Generators shall comply with the requirements of ISO 8528-12.

Automatic Test Systems (ATS) **-** When automatic testing systems are used, these systems shall carry out tests to comply with I.S. EN 50172 and I.S. EN 62034.(See below)

Additional Notes:

A log book shall be available on the premises in the care of a responsible person and should be readily available for examination by any duly authorised authority.
The log book shall be used to record the following information:

- **a)** date of the commissioning of the system including any certificate relating to alterations;
- **b)** date of each periodic inspection and test certificate;
- **c)** date and brief details of each inspection, maintenance or test carried out;
- **d)** date and brief details of any defects and of remedial action taken;
- **e)** date and brief details of any alterations to the emergency lighting installation;
- **f)** if any automatic testing device is employed, the main characteristic and the mode of operation of that device shall be described (see I.S. EN 50172 and I.S. EN 62034);
- **g)** details of replacement components or luminaires such as lamp type, battery and fusing;
- **h)** managerial responsibilities – a functional test shall be carried out 4 times per year (i.e. 18 minutes maximum or 30 minutes as required) and a full duration test once per year;
- **i)** a periodic test certificate shall be provided on the completion of the full duration test. This test shall be carried out at least once per year.

Requirements of I.S E.N. 62034:2007 Automatic Systems for Battery Powered Emergency Escape Lighting

Automatic Test Systems (ATS) can be manually initiated, consist of parts e.g. timers, current detectors, light detectors etc, which when connected together make a system that can carry out the routine testing requirements of emergency lighting luminaries and indicate the results.

This standard specifies the basic performance and safety requirements for individual products and components that are incorporated into automatic test systems for use with emergency lighting system on supply voltages not exceeding 1000v and the required functionality of a complete automatic test system for an emergency lighting system.

The standard also applies to testing systems with a number of emergency lighting self-contained luminaries or a central battery with associated emergency lighting luminaries.

Manual test facilities that rely on manual initiation and/or visual inspection of the lamp condition are outside the scope of this standard.

The standard specifies that a functional test should be performed at least once a month and the test duration shall be sufficient to check the illumination of the lamp and shall not be longer than 10% of the rated duration (defined in IEC 60598-2-22).

For full rated duration a test shall be performed according to the manufacturers instructions at the commissioning of the ATS and repeated automatically at least annually.

Random automatically initiated rated duration test should be carried out between 4 and 52 weeks after commissioning.

Automatic Door Releases

Applicable S.I / Code of Practice/Standards:

- BS 7273-4:2007 Code of practice for the operation of fire protection measures –Part 4: Actuation of release mechanisms for doors (although this is a British Standard it was the only applicable one that could be located).

- BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.

Requirements of BS 9999:2008 - *Daily Routine for Automatic Door Releases:*

All doors that are held open by automatic release mechanisms should be released daily.

Requirements of BS 7273-4:2007 - *Weekly Routine for Automatic Door Releases:*

Every week, a fire alarm signal(s) should be used to cause actuation of all release mechanisms. It should be confirmed that each release mechanism operates correctly and that the doors close properly, unlock or revert to the fully open position, as appropriate. This test should normally be carried out at approximately the same time each week.

Where not all release mechanisms in the building are actuated when the weekly test is carried out, a suitable test regime should be developed to ensure that, at least, all release mechanisms (but not necessarily the associated circuits) are tested every week. If, for example, in a building with multiple alarm zones, a number of different relays are provided to each cause actuation of release devices in only one or more alarm zones, the test regime should ensure that a different relay is operated each week, so that all relays are tested in rotation; all individual release mechanisms could then be tested every week (e.g. by operation of a manual release control on each release mechanism).

Requirements of BS 9999:2008 - *Monthly Routine for Automatic Door Releases:*

BS 9999:2008 specifies that the operation of fail-safe mechanisms should be tested once a month, either by "breaking-out" the doorset or by simulating failure of the mains power supply, as appropriate. The results of the test should be recorded. Any doors that are found to be faulty should be repaired or replaced.

Requirements of BS 7273-4:2007 - *6-Monthly Routine for Automatic Door Releases:*

According to BS 7273-4 the competent person should carry out inspection and servicing at intervals not exceeding six months. This may be carried out as part of the periodic inspection and servicing of the fire detection and fire alarm system.

(a) The logbook for the fire detection and fire alarm system should be examined. It should be ensured that any faults in respect of release mechanisms, associated equipment or their circuits have received appropriate attention;

(b) A visual inspection should be made to check whether structural or occupancy changes have affected compliance. Particular care should be taken to verify whether:

- All manual release controls necessary for compliance with this part of BS 7273 remain unobstructed and conspicuous;
- Any new electronically secured doors have been created without the provision of an adjacent manual release control;
- Any changes to the layout, use or occupancy of an area make the provision or siting of automatic fire detectors non-compliant;

(c) Any batteries should be checked in accordance with the equipment manufacturer's instructions;

(d) All fire alarm sounders needed for correct operation of acoustically actuated release mechanisms should be checked for correct operation unless this work has been carried out as part of the inspection and servicing of the fire detection and fire alarm system within the previous three months;

(e) Any fault indicators necessary for compliance with this part of BS 7273 should be checked, where practicable, by simulation of fault conditions;

(f) All further checks and tests recommended by the manufacturer of the release mechanisms and associated equipment should be carried out;

(g) On completion of the work, any outstanding defects should be reported to the responsible person, an entry should be made in the logbook of the fire detection and fire alarm system and a servicing certificate should be issued.

Requirements of BS 7273-4:2007 - *Annual Routine for Automatic Door Releases*

It is recommended that the following work be carried out **every year:**

(a) The switch mechanism of every manual release control necessary for compliance should be tested, either by removal of a frangible element, insertion of a test key or operation of the device as it would be operated in the event of fire;

(b) All primary (non-rechargeable) batteries that are required to provide power for the correct operation of equipment must be replaced;

(c) A visual inspection should be made to confirm that all readily accessible cable fixings are secure and undamaged;

(d) All further annual checks and tests recommended by the manufacturer of the release mechanisms and associated equipment should be carried out.

Gas Detection Systems

Applicable S.I / Code of Practice/Standards:

- IS EN 50073:1999 Guide for selection, installation, use and maintenance of apparatus for detection and measurement of combustible gases or oxygen.

This standard deals with fixed and transportable gas detection systems, but does not specify exact sequence of inspection. Instead it refers reader to manufacturer's guidelines - some guidance is given on what inspections "may" contain rather than what they must contain.

According to the standard a sequence of inspections may include the following:

(a) Resetting of the mechanical zero of analogue meters;
(b) Checking the tightness of all electrical connections (remote detector head, power supply etc.);
(c) Allowing adequate warm-up time;
(d) Checking for sample-line leaks and proper flow;
(e) Checking for clogged or dirty flame-arresting systems;
(f) Checking the battery voltage and/or battery condition and making any required adjustments or battery replacements;
(g) Performing a test of the failure (malfunction) circuit(s);
(h) Checking that a zero reading is displayed when operated in clean air and the response test, as follows. Place the detector head (integral or remote) or the sampling line in an atmosphere free of combustible gas; aspirate a large enough sample to purge the lines (applicable only to apparatus with sampling lines). If a significant deviation from zero is observed, the apparatus should be recalibrated.

The response (sensitivity) of the apparatus should be checked using the field calibration kit in accordance with the manufacturer's recommendation and a known combustible gas/air mixture equivalent to 25 % to 75 % of the full-scale concentration for which the apparatus is indicated to be used. If the test results are not within □10 % of the applied gas concentration, the apparatus should be recalibrated.

For alarm-only apparatus, a test gas concentration should be applied which is equal to 5 % LEL above the highest alarm set point of the apparatus. All alarms should actuate during this test. If an apparatus fails this procedure, and suggested corrective action does not solve the problem, the apparatus should be recalibrated.

The results of these checks should be recorded and repaired/replaced as necessary.

Smoke Control Systems

Applicable S.I / Code of Practice/Standards:

Smoke control systems are dealt with under **European Standard 12101** on smoke and heat control systems. This European Standard has the general title "*Smoke and heat control systems"* and consists of the following parts (not all relevant to inspection):

Part 1: Specification for smoke barriers;
Part 2: Specification for natural smoke and heat exhaust ventilators;
Part 3: Specification for powered smoke and heat exhaust ventilators;
Part 4: Fire and smoke control installations – Kits (currently under development to be released in 2009);
Part 5: Design and calculation for smoke and exhaust ventilation systems
Part 6: Specification for pressure differential systems – Kits;
Part 7: Smoke control ducts;
Part 8: Specification for smoke control dampers;
Part 9: Control panels and emergency control panels;
Part 10: Power supplies (currently under development to be released in 2009);

BS 7346 also deals with smoke and heat control systems and has four parts the first three are to be replaced by EN 12101 but part 4 - *BS 7346-4:2003 Components for smoke and heat control systems. Functional recommendations and calculation methods for smoke and heat exhaust ventilation systems, employing steady-state design fires — Code of practice* is not and so is relevant. However it should be noted that the parts of EN 12101 currently under development might replace BS 7346-4.

BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings

Requirements of BS 9999:2008

Contains some general requirements for Smoke Control Systems and provides the following general recommendations:

- Actuation of the system should be simulated **once a week.** It should be ensured that any fans and powered exhaust ventilators operate correctly, smoke dampers close (or open in some systems), natural exhaust ventilators open, automatic smoke curtains move into position, etc;

- In addition the actuation of all smoke control systems should be simulated once **every three months.** All zones should be separately tested and it should be ensured that any fans and powered exhaust ventilators operate correctly, smoke dampers close (or open in some systems), etc;

- Yearly test also recommended although they are not described;

Ventilation and air conditioning ductwork:

Arrangements should be made for all fire dampers to be tested by a competent person on completion of the installation and at **regular intervals not exceeding 2 years**, and to be repaired or replaced immediately if found to be faulty.

Spring-operated fire dampers should be tested **annually** and fire dampers situated in dust-laden and similar atmospheres should be tested much more frequently, at periods suited to the degree of pollution.

Arrangements should be made for periodic maintenance of any smoke detector system used to operate fire dampers and for such system(s) to be tested by a competent person after installation to determine whether detection occurs at the appropriate design smoke density. Any smoke detector system that is found to be faulty should be either repaired or replaced immediately.

Requirements of IS EN 12101 – 2:

Two types of natural smoke and heat exhaust ventilation systems are covered in this standard:

1. An automatic natural smoke and heat exhaust ventilator is designed to open automatically after the outbreak of fire if called upon to do so. A system may be automatic but also contain a manual operating device;
2. Manually opened natural smoke and heat exhaust ventilator refers to a natural smoke and heat exhaust ventilator that can only be opened by a manual control or release device'

It is stated that supplier shall provide appropriate maintenance information for the ventilator, which shall include the following:

- Inspection and maintenance procedure;
- Recommended frequency of operational checks;
- Recommended checks for the effects of corrosion.

Requirements of BS 7346-4:2003

This part of BS 7346 gives recommendations and guidance on functional and calculation methods for smoke and heat exhaust ventilation systems for steady-state design fires (design fire based on the largest fire with which a smoke and heat exhaust ventilation system is expected to cope).

It is intended for a variety of building types and applications, including single-storey buildings, mezzanine floors, warehouses with palletized or racked storage, shopping malls, atria and complex buildings, car parks, places of entertainment and public assembly and uncompartmented space within multi-storey buildings.

This standard does not cover the following:

(a) Smoke clearance, where smoke is exhausted from a building after the fire has been suppressed;

(b) Cross-ventilation, where wind-induced or fan-induced air currents sweep smoke through and out of the building, usually as part of fire-fighting operational procedures;
(c) Ventilation of stairwells, which usually represents a special application of smoke clearance and which does not necessarily protect the continued use of the stairwell;
(d) Fully involved fires (fire in which all surfaces of the combustible materials are totally involved).

All selected components should be installed in accordance with BS 7346-1, BS 7346-2 and BS 7346-3 (NOTE: these have been replaced by EN 12101.)

SHEVS should be maintained and regularly tested in accordance with the requirements of BS 9999 (see above). Inlet air devices should be maintained and tested as frequently as the ventilators. As part of the maintenance, staff should ensure that the inlet air devices are free of any obstacles.

Gas Installations

Applicable S.I / Code of Practice/Standards:

I.S. 820:2000 Non Domestic Gas Installations
The Energy (Miscellaneous Provisions) Act, 2006

Requirements of I.S. 820:2000 Non Domestic Gas Installations

Under I.S. 820:2000, it states that appliances shall be serviced at intervals indicated in the manufacturer's instructions or at more frequent intervals if dictated by the conditions of use and in general at minimum intervals of one year.

Requirements of The Energy (Miscellaneous Provisions) Act, 2006

Under The Energy (Miscellaneous Provisions) Act 2006 a person shall not carry out works which are gas works unless that person is:

a) a registered gas installer;
b) a gas transmission system operator carrying out its functions in accordance with the terms and conditions of the relevant licence;
c) a gas distribution system operator carrying out its functions in accordance with the terms and conditions of the relevant licence;
d) a gas emergency officer appointed by commission for energy regulation;
e) a gas safety officer appointed by commission for energy regulation.

APPENDIX 1

Safety Health and Welfare at Work (General Application) Regulations, 2007

Schedule 1
Part E — Information to be contained in report of thorough examination

And

Regulation 54
Keeping of records and registers of lifting equipment

Information to be contained in report of thorough examination

1. The name and address of the employer or owner for whom the thorough examination was made.

2. The address of the premises at which the thorough examination was made.

3. Particulars sufficient to identify the lifting equipment including, where known, its date of manufacture.

4. Date of this examination and date of the last thorough examination if known.

5. The safe working load of the lifting equipment or, where its safe working load depends on the configuration of the lifting equipment, its safe working load for the different configurations that have been determined.

6. The purpose of the examination including examination before putting into use for the first time, examination after installation or after assembly at a new site or in a new location, examination after repairs or alterations and periodic examination.

7. In relation to every thorough examination of lifting equipment—

(a) Identification of any part found to have a defect which is or could become a danger to persons and a description of the defect;
(b) Particulars of any repair, renewal or alteration required to remedy a defect found to be a danger to persons;
(c) In the case of a defect which is not yet but could become a danger to persons

(i) The time by which it could become such danger;
(ii) Particulars of any repair, renewal or alteration required to modify it;

(d) The latest date by which the next thorough examination must be carried out;
(e) Where the thorough examination included testing, particulars of any test;
(f) Identification of parts not accessible for examination.

8. The name, address and qualifications of the individual making the report and, where appropriate, the name and address of the individual's employer.

9. Where appropriate, the name and position of a person signing or authenticating the report on behalf of its author.

Safety Health and Welfare at Work (General Application) Regulations, 2007, Regulation 54 - Keeping of records and registers of lifting equipment.

(1) An employer shall ensure that a report, under Regulation 53, or a copy of it:

- **(a)** is kept at the place of work when the lifting equipment is permanently located there;
- **(b)** in the case of lifting equipment on a construction site, is kept at the site office or at the business address of the contractor for whom the report was made;
- **(c)** and in the case of mobile equipment, is kept on the equipment in addition to being available for inspection at the address of the equipment owner.

(2) An employer shall ensure that:

- **(a)** A register of lifting equipment and lifting accessories containing details of the equipment, distinguishing number, date of first use and date of last thorough examination and testing is maintained and kept available for inspection by an inspector, and;
- **(b)** If the equipment does not have a distinguishing number or mark, one of long lasting duration is provided.

Appendix 2

Requirements for Annual Examination and Maintenance of Water, Foam, Powder and CO_2 Extinguishers as specified in IS EN 291:2002

1. Stored Pressure Extinguishers – Water & Foam

All stored pressure water and foam type extinguishers shall be subject to the following inspection annually:

(a) Examination of the seal to ensure it is intact – if not this should be noted and replaced if extinguisher fulfils other inspection requirements;
(b) The pressure gauge indication or reading should be observed to ensure it reads within the operating range marked on the extinguisher label. An accurate independent pressure gauge should be attached to the filling or testing to verify to verify extinguisher gauge is reading correctly;
(c) The weight of extinguisher should be noted and compared to suppliers/manufacturers data;
(d) The body of the extinguisher shall be examined externally for signs of corrosion/damage. If corrosion with pitting or mechanical damage likely to reduce the strength of the body then the extinguisher shall be removed from service;
(e) Cleaning of the discharge nozzle and examination of discharge hose and replacement if necessary;
(f) Record any points noted in maintenance/service register.

A **third** of both water and foam type fire extinguishers on premises should be subject to further examination annually, this examination is also required if the results of examination above reveal:

(a) The extinguisher gauge does not read correctly or if pressure indicated differs by more than 10% from the recommended pressure marked on label. If the gauge is subsequently found to be defective it shall be replaced;
(b) If the difference in mass is more than 10% of the mass of the charge.

This examination for a third of **stored pressure water extinguishers** should involve:

(a) Discharge of the extinguisher;
(b) Opening of the extinguisher – if opening extinguisher reveals pressure is not being released after unscrewing headcap slowly then the headcap should be rescrewed into place and extinguisher replaced. (PPE may be required for this task and if extinguisher as to be opened under residual pressure a suitable calming device shall be provided);
(c) Residual Charge – any liquid in the extinguisher should be discarded and internal body washed out;
(d) Examination of extinguisher body components including:

- An internal examination for signs of corrosion or damage using an illuminating probe, should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body then the extinguisher shall be removed from service.
- Examination of operating device and discharge control valve for free movement. Repair or replacement should occur if required.
- Discharge nozzle, strainer and internal discharge tube should be inspected and cleaned if necessary.

- The discharge hose and sealing washers should be inspected for signs of deterioration and replaced if necessary.
- The threads of neck of extinguisher and headcaps should be cleaned and checked for wear or deformity and replaced if any found;

(e) Replacement of Charge with clean water and any additive required by supplier's recommendations;

(f) Reassembling and Sealing –this involves refitting and resealing headcap, applying air or nitrogen under pressure to filling connection and allowing pressure to increase gradually until desired level reached, replacing securing device in position and fitting a new seal on operating device;

(g) Maintenance undertaken should be recorded on service label attached to extinguisher and in the maintenance service register – the date and signature of operator should be included on both and particulars of any replacements made and lack of compliance with EN-3.

This examination for a third of **stored pressure foam extinguishers** should involve:

(a) Discharge of the extinguisher;

(b) Opening of the extinguisher – if opening extinguisher reveals pressure is not being released after unscrewing headcap slowly then the headcap should be rescrewed into place and extinguisher replaced. (PPE may be required for this task and if extinguisher as to be opened under residual pressure a suitable calming device shall be provided);

(c) Examination of Residual Charge –

As certain types of foam producing compounds are subject to bacterial decay then the liquid shall be examined and if found to have foul smell or black appearance (rather than brown) or if sludge is present then liquid shall be discharged and extinguisher cleaned out, disinfected and rinsed with clean water.

When foam compound is held in a separate container then this should be weighed, checked for leakage and examined for bacterial decay as before. If any loss of mass is found, the container is leaking or bacterial decay evident the material should be discarded and replaced by charged container as provided by supplier – this should be recorded in maintenance/service register.

(d) Examination of extinguisher body components including:

- An internal examination for signs of corrosion or damage using an illuminating probe, should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body then the extinguisher shall be removed from service.
- Examination of operating device and discharge control valve for free movement. Repair or replacement should occur if required.
- Aspirating nozzle, strainer, internal discharge tube, vent holes in headcap and breather valve, where fitted, should be inspected and cleaned if necessary.
- The discharge hose and sealing washers should be inspected for signs of deterioration and replaced if necessary.
- The threads of neck of extinguisher and headcaps should be cleaned and checked for wear or deformity and replaced if any found;

(e) Replacement of Charge with foam solution and any additive required by supplier's recommendations where foam compound added as solution or replacement of container where foam compound held in separate container.

(f) Reassembling and Sealing –this involves refitting and resealing headcap, applying air or nitrogen under pressure to filling connection and allowing pressure to increase gradually until desired level reached, replacing securing device in position and fitting a new seal on operating device

(g) Maintenance undertaken should be recorded on service label attached to extinguisher and in the maintenance service register – the date and signature of operator should be included on both and particulars of any replacements made and lack of compliance with EN-3.

2. Cartridge Type– Water

All cartridge type water and foam type extinguishers shall be subject to the following inspection annually:

(a) Opening of Extinguisher:

Examination of the seal to ensure it is intact – if not the extinguisher should be completely discharged using discharge control device. If opening extinguisher reveals pressure is not being released after unscrewing headcap slowly then the headcap should be rescrewed into place and extinguisher replaced. (PPE may be required for this task and if extinguisher as to be opened under residual pressure a suitable clamping device shall be provided)

(b) Examination of Charge:

Liquid should be examined for signs of sedimentation and discarded if this found, if not record the liquid level and put into clean receptacle for reuse. The extinguisher body should then be washed out fully and the gas cartridge removed and replaced or weighed and mass compared to suppliers information. If a loss of more than 10% of the charge mass is observed or if cartridge shows signs of deformity it should be replaced and this should be recorded in maintenance register.

(c) Examination OF Extinguisher body and Components

- An internal and external examination for signs of corrosion or damage using an illuminating probe, should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body then the extinguisher shall be removed from service.
- Examination of operating device for free movement and piercing device should be completely withdrawn to initial position after release of control lever. The point of the piercing device should be sufficiently sharp. Repair or replacement should occur if required.
- Discharge nozzle, strainer and internal discharge tube and breather valve and vent hole in headcap should be inspected and cleaned if necessary.

- The discharge hose and sealing washers should be inspected for signs of deterioration and replaced if necessary.
- The threads of neck of extinguisher and headcaps should be cleaned and checked for wear or deformity and replaced if any found.

(d) Replacement of Charge

- The fully charged cartridge should be refitted into position and if the original solution was retained it shall be returned to extinguisher and water added to bring liquid to required level. If not clean water and any additives required should be placed in extinguisher to required level

(e) Reassembling and Sealing –this involves refitting and resealing headcap and fitting a new seal to the operating device

(f) Maintenance undertaken should be recorded on service label attached to extinguisher and in the maintenance service register – the date and signature of operator should be included on both and particulars of any replacements made and lack of compliance with EN-3.

In addition at least **one fifth** of the extinguishers should be completely discharged.

3. Cartridge Type– Foam

All cartridge foam type extinguishers shall be subject to the following inspection annually:

(a) Opening of Extinguisher:

Examination of the seal to ensure it is intact – if not the extinguisher should be completely discharged using discharge control device. If opening extinguisher reveals pressure is not being released after unscrewing headcap slowly then the headcap should be rescrewed into place and extinguisher replaced. (PPE may be required for this task and if extinguisher as to be opened under residual pressure a suitable clamping device shall be provided)

(b) Examination of Charge:

As certain types of foam producing compounds are subject to bacterial decay then the liquid shall be examined and if found to have foul smell or black appearance (rather than brown) or if sludge is present then liquid shall be discharged and extinguisher cleaned out, disinfected and rinsed with clean water. If the residual charge is satisfactory it should be poured into a clean container for reuse.

When foam compound is held in a separate container then this should be weighed, checked for leakage and examined for bacterial decay as before. If any loss of mass is found, the container is leaking or bacterial decay evident the material should be discarded and replaced by charged container as provided by supplier – this should be recorded in maintenance/service register.

The gas cartridge should be removed and replaced or weighed and mass compared to suppliers' information. If a loss of more than 10% of the charge mass is observed or if cartridge shows signs of deformity it should be replaced and this should be recorded in maintenance register.

(c) Examination of Extinguisher body and Components

- An internal and external examination for signs of corrosion or damage using an illuminating probe, should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body then the extinguisher shall be removed from service.
- Examination of operating device and discharge control valve for free movement. Repair or replacement should occur if required.
- Aspirating nozzle, strainer, internal discharge tube, vent holes in headcap and breather valve, where fitted, should be inspected and cleaned if necessary.
- The discharge hose and sealing washers should be inspected for signs of deterioration and replaced if necessary.
- The threads of neck of extinguisher and headcaps should be cleaned and checked for wear or deformity and replaced if any found.

In addition at least one fifth of the extinguishers should be completely discharged.

4. Powder Type Extinguishers.

General requirements: As the extinguisher powder will absorb moisture if exposed to air of high relative humidity, powder extinguishers shall be opened only in the driest available conditions and for the least time necessary for examination to minimise absorption of moisture by the powder.

Where a number of extinguishers are being examined only those containing the same type of powder shall be opened for examination at any one time and in the examination only clean dry receptacles shall be used.

Stored Pressure Powder Type Extinguishers

At annual intervals all of the extinguishers shall be subjected to the following examination:

(a) The seal shall be examined to see if it is intact and if not this shall be noted and replaced if necessary;

(b) The pressure gauge indication or reading shall be observed to see if it lies within the operating range marked on the extinguisher label. A suitable type of accurate independent pressure gauge shall be connected to the filling or testing connection to verify that the extinguisher gauge is reading correctly. If the extinguisher gauge does not read correctly, or if the indicated pressure differs by more than 10% from the recommended pressure marked on the extinguisher label, the extinguisher shall be subjected to the further examination. The gauge, if defective, shall be replaced after the extinguisher is opened. This shall be noted;

(c) The extinguisher shall be weighed and its mass compared with the supplier's/manufacturer's data. If the difference in mass is more than 10% of the mass of the charge this shall be noted and the extinguisher shall be subjected to the further examination;

(d) The body of the extinguisher shall be examined externally for signs of corrosion or damage. Should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body, the extinguisher shall be removed from service and dealt with in accordance with requirements for defective extinguishers (Clause 7.2. IS EN 291:2002);

(e) The discharge nozzle and discharge hose shall be examined. If traces of powder are found to be present this shall be noted and the extinguisher shall be subjected to the further examination;

(f) The discharge hose shall be examined for signs of deterioration and replaced if necessary;

(g) A record shall be made in the maintenance/service register of any points noted in this examination;

A **fifth** of stored pressure powder type extinguishers on premises should be subject to further examination annually, this examination is also required if the results of examination above reveal;

- The extinguisher gauge does not read correctly, or if the indicated pressure differs by more than 10% from the recommended pressure marked on the extinguisher label;
- The difference in mass is more than 10% of the mass of the charge;
- Traces of powder are found to be present.

When the total number is four or less, one shall be examined. Within a five-year period all shall have been examined. The extinguishers taken for examination shall be those which

have had the longest period since previous maintenance but shall not include any removed from service in the course of the examination outlined above.

This examination should involve:

(a) Discharge of extinguisher;

The extinguisher shall be completely discharged by actuation of the discharge control device.

(b) Opening of extinguisher;

The headcap shall be unscrewed slowly one or two turns only, to allow any residual pressure to escape through the venting arrangements, and then unscrewing shall be continued directing the headcap away from the operator. If the pressure is not being released after unscrewing one or two turns the headcap shall be rescrewed into place, the extinguisher returned to the supplier and arrangements made for its immediate replacement. If the extinguisher has to be opened while under residual pressure a suitable clamping device shall be provided to prevent injury to the operator or damage to the extinguisher. The operator shall use appropriate personal protection.

(c) Residual charge;

Any residual powder shall be examined and any caking found shall be noted in the maintenance register. The powder shall be discarded and the internal surfaces of the extinguisher cleaned to remove all traces of powder.

(d) Examination of extinguisher body and components;

The extinguisher body shall be examined internally for corrosion or damage using an illuminating probe and reflector. Should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body, the extinguisher shall be removed from service and dealt with in accordance with Clause 7.2.
The operating device and the discharge control valve shall be examined for free movement and shall be repaired or replaced if necessary.

The internal discharge tube, and the vent holes in the headcap shall be examined and cleaned. The discharge nozzle shall be cleaned, removing any adhering particles of powder.

Dry compressed air shall be blown separately through the nozzle, discharge hose, headcap and dip-tube to dislodge any powder present.

The hose and sealing washers shall be examined for signs of deterioration and shall be replaced if necessary. The threads of the neck of the extinguisher and the threads of the headcap shall be cleaned and the gasket or 0 ring checked for wear or deformity and, if necessary, replaced.

(e) Replacement of charge;

The internal surface of the extinguisher shall be examined to ensure that it is dry. Powder of the type and mass marked on the extinguisher label shall be placed in the extinguisher.

(f) Reassembling and sealing;

The headcap shall be fitted onto the body of the extinguisher ensuring that it is correctly seated and tightened to ensure that it is properly sealed. Dry air, carbon dioxide or nitrogen under pressure shall be applied to the filling connection and the pressure allowed to increase gradually until the required pressure is reached.

(g) Recording of maintenance;

A record of the maintenance shall be inscribed on the service label attached to the extinguisher and in the maintenance/service register and the date and signature of the operator added. Also, particulars of any replacements made, together with any lack of compliance with the EN 3, which was noted, shall be entered in the maintenance/service register and on the service label.

Cartridge Type powder extinguishers

Maintenance of cartridge type powder extinguisher consists of an annual examination of the extinguisher in accordance with requirements below:

(1) Opening of extinguisher;

The seal should be intact. If not, the extinguisher shall be completely discharged by actuation of the discharge control device. The headcap shall be unscrewed slowly one or two turns only, to allow any residual pressure to escape through the venting arrangements, and then unscrewing shall be continued directing the headcap away from the operator. If the pressure is not being released, after unscrewing one or two turns, the headcap shall be rescrewed into place, the extinguisher returned to the supplier and arrangements made for its immediate replacement.
If the extinguisher has to be opened while under residual pressure a suitable clamping device shall be provided to prevent injury to the operator or damage to the extinguisher. The operator shall use appropriate personal protection.

(2) Examination of charge;

The powder shall be examined while in the extinguisher to check that there are no visible signs of caking, lumps or foreign bodies. The powder shall be agitated by inverting and shaking the extinguisher, taking care to avoid spillage. If there is any evidence of caking, lumps or foreign bodies, or if it is not free flowing or if there is any doubt, the powder shall be discarded and an entry made to this effect in the maintenance/service register.

(3) Examination of extinguisher body and components;

The extinguisher body shall be examined externally and internally for corrosion or damage using illuminating probe and reflector. Should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body the extinguisher shall be removed from service and dealt with in accordance with Clause 7.2.

The operating device shall be examined for free movement and to ensure that the piercing device is completely withdrawn to its initial position after release of the control lever. Any defective components shall be repaired or replaced if necessary. The point of the piercing device shall be examined and if not sufficiently sharp shall be replaced. The securing device shall be replaced in position. The internal discharge tube and vent holes in the headcap shall be cleaned. The discharge nozzle shall be cleaned and any adhering particles of powder removed. Dry compressed air shall be blown separately through the nozzle, discharge hose, headcap and dip-tube to dislodge any powder present. The hose and sealing washers shall be examined for signs of deterioration and replaced if necessary. The threads of the neck of the extinguisher and the threads of the headcap shall be cleaned and the gasket or 0 ring checked for wear or deformity and, if necessary, replaced.

(4) Replacement of charge;

The fully charged cartridge shall be fitted in position. The internal surface of the extinguisher shall be examined to ensure that it is dry. The powder if retained shall be replaced in the extinguisher. It is essential to ensure that the powder is in good condition. If the powder was discarded, powder of the correct type and mass as marked on the extinguisher label shall be placed in the extinguisher.

(5) Reassembling and Sealing;

The headcap shall be fitted onto the body of the extinguisher ensuring that it is correctly seated and tightened to ensure that it is properly sealed. A new seal shall be fitted to the operating device.

(6) Recording of maintenance;

A record of the maintenance shall be inscribed on the service label attached to the extinguisher and in the maintenance/service register and the date and signature of the operator added. Also, particulars of any replacements made, together with any lack of compliance with EN 3, which was noted, shall be entered in the maintenance/service register and on the service label.

During maintenance at least one fifth of the extinguishers shall be completely discharged by actuation of the discharge control device. Within a five-year period all shall have been test discharged in this manner. Spare charges shall be obtained in advance to recharge the extinguisher immediately after the discharge test. This should, if possible, be incorporated in staff training.

(7) Carbon Dioxide Extinguishers;

At annual intervals all of the extinguishers shall be subjected to the examination below:

(a) The seal shall be examined to see if it is intact, and if not this shall be noted. If the extinguisher complies with the requirements of examination the seal shall be replaced.

(b) The extinguisher complete with all its fittings shall be weighed and its mass compared with that marked on the label by the supplier. If the difference is more

than 10% of the mass of the charge, this shall be noted and the extinguisher shall be subjected to further examination.

(c) The body of the extinguisher shall be examined externally for signs of corrosion or damage. Should corrosion with pitting be found or mechanical damage likely to reduce the strength of the body, this shall be noted, the extinguisher shall be further examined removed from service and arrangements made for it to be pressure tested in accordance with Clause 11.3 on pressure testing This shall be noted in the maintenance/service register. Arrangements shall be made for replacement of such extinguishers by fully charged extinguishers.

(d) The discharge nozzle, horn, and hose, if fitted, and sealing washers shall be examined for signs of mechanical damage and shall be cleaned or replaced if not in good condition. If any part such as the nozzle is missing this shall be noted. The discharge nozzle, horn and hose shall be refitted in position and all connections securely tightened. Under no circumstances should the maintenance operator remove the cylinder neck valve from the cylinder.

(e) A record of the examination shall be made on the record label. An entry of any points noted shall be made in the maintenance/service register and the date and signature of the operator added. Particulars of any replacement extinguishers put into service shall be entered.

A **fifth** of stored pressure powder type extinguishers on premises should be subject to further examination annually, this examination is also required for extinguishers which has not been pressure tested within the previous 10 years and any previously pressure tested but not re-tested within the previous 5 years and the results of examination above reveal;

- The difference in weight is more than 10% of the mass of the charge.
- Corrosion with pitting be found or mechanical damage likely to reduce the strength of the body

When the total number is four or less one shall be examined. Within a five-year period all shall have been examined. The extinguishers taken for examination shall be those which have had the longest period since previous maintenance but shall not include any removed from service in the course of the examination above.

This examination should entail:

(a) Discharge of extinguishers;

The extinguisher shall be completely discharged. During the discharge the operating device shall be examined for satisfactory functioning and shall be repaired or replaced if necessary.

(b) Recharging;

Arrangements shall be made to have the extinguisher recharged (in accordance with Clause 10.2) and to have a fully charged extinguisher provided in its place. An identification number shall be applied to this extinguisher in accordance with Clause 7.6.

(c) Recording of maintenance.

A record of the maintenance shall be inscribed on the service label attached to the extinguisher and in the maintenance/service register and the date and signature of the operator added. Also, particulars of any replacement made, together with any lack of compliance with EN 3, which was noted, and particulars of the replacement extinguisher put into service shall be entered in the register and on the service label.