

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

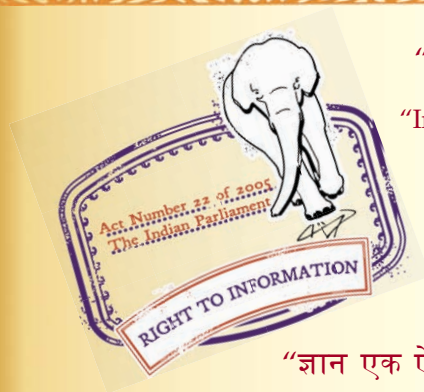
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11460 (1985): Code of Practice for Fire Safety of Libraries and Archives [CED 36: Fire Safety]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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REAFFIRMED

2005

IS : 11460 - 1985
(Reaffirmed 1996)

Indian Standard
CODE OF PRACTICE FOR
FIRE SAFETY OF LIBRARIES AND ARCHIVES

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

CODE OF PRACTICE FOR FIRE SAFETY OF LIBRARIES AND ARCHIVES

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(Continued on page 2)

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IS : 11460 - 1985

(Continued from page 1)

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AMENDMENT NO. 1 FEBRUARY 2005
TO
IS 11460 : 1985 CODE OF PRACTICE FOR
FIRE SAFETY OF LIBRARIES AND ARCHIVES

(*Page 12, clause 5.2.3*) — Substitute the following for the existing:

'Clean Agent Systems — These systems employ clean agents like HCFC Blend A, HFC 227 ea, IG 01, IG 55, IG 100, IG 541.'

(CED 36)

Reprography Unit, BIS, New Delhi, India

Indian Standard

CODE OF PRACTICE FOR FIRE SAFETY OF LIBRARIES AND ARCHIVES

0. FOREWORD

0.1 The Indian Standard was adopted by the India Standards Institution on 30 October 1985, after the draft finalized by the Fire Safety Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Irrespective of their size, all libraries/archives have one thing in common that is, they all have ample combustible materials in the form of books/records periodicals and other materials, such as microfilms, magnetic tapes, phonograph records and motion picture films, etc. When involved in fire, these materials burn and contribute to the growth of fire.

0.3 Fire in a library/archives may jeopardize the lives of the staff and users and destroy its contents, which may represent a collection of more than a few centuries. Consequential losses due to a library/archives fire cannot be assessed in terms of money. The losses are irreparable.

0.4 Libraries/Archives of all types are expanding at an enormous rate. Increase in demand for documents, official policy and increase in literacy make this process inevitable. Since the development of new library takes several years, the stock to be accommodated on the opening day, therefore, is larger than what was estimated at the planning stage. Unless the building for the library is planned to meet the futuristic requirements, it may result in haphazard growth, additions and alterations later, thereby adding to the fire hazard.

0.5 In all cases, it is of utmost importance that due emphasis should be laid, at the planning stage, to analyse the fire hazards and vulnerabilities embodied in the building(s) for the library/archives and its various operations, when it is on going, and to plan and implement suitable measures for mitigating the hazards and vulnerabilities.

0.6 While full compliance with the applicable building and fire codes may ensure a reasonable level of public safety in the existing construction,

IS : 11460 - 1985

it should be realised that reliance upon codes alone may not provide adequate protection for high-value collections and rare books/records and other associated materials and adequate measures as needed be measured.

0.7 The details with regard to the planning, design and construction of the library buildings and buildings for archives have been covered in IS : 1553-1976* and IS : 2663-1977† respectively which also cover aspects of fire protection. These standards, therefore, should be used in conjunction with this standard which cover all the aspects including fire protection and fire safety measures of these buildings required during construction of structures.

0.8 This Indian Standard, therefore, covers the fire safety and fire protection measures needed after the construction of the building mentioned in 0.7.

0.9 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This code covers the fire safety and fire protection measures of libraries and archives required after the construction of structure according to IS : 1553-1976* and IS : 2663-1977†.

1.2 This code does not cover fire safety aspects of libraries for special classes of users, such as library for the blind, field library (military), etc.

2. GENERAL

2.1 Fire safety of libraries/archives is based on prevention, early detection/suppression and the knowledge of the personnel at hand to cope with a possible fire emergency. The basic considerations for the design of libraries/archives considering the following factors at the planning stage have been considered in IS : 1553-1976* and IS : 2663-1977†:

- a) The basic structure of the building, its layout, compartmentation and type of construction, whether independent or part of other building;

*Recommendations relating to primary elements in the design of library buildings.

†Recommendations relating to primary elements in the design of buildings for archives.

‡Rules for rounding off numerical values (revised).

- b) Electrical installation, including lighting and portable appliances;
- c) Heating and ventilating systems, if required;
- d) The number of visitors and staff;
- e) Storage of books/records and other materials;
- f) Display of exhibits; and
- g) The number and location of exits and escape routes.

2.2 In case the provision of record rooms have not been made according to the provision given in revision of IS : 1553-1976* and IS : 2663-1977† the following provision be made which have been designed so as to ensure fire protection.

2.2.1 A vault is a completely fire resisting enclosure, having an internal cubical capacity of not more than 1 500 m³, which is exclusively used for storage of records. It should be so equipped, maintained and supervised that the possibilities of an out break of fire within the vault or for the spread of fire (from outside) into the vault, when the vault door is closed, are reduced to the minimum possible.

2.2.2 Depending upon the total fire load and the expected security of fire outside the vault, the fire resistant rating may not be less than two hours.

2.2.3 When exposed to a fire, the internal temperature of the vault and that of the interior face of the vault door should not exceed 175°C so that paper records do not get charred or ignited.

2.2.4 The vault enclosure should not be pierced at any point, except for the vault door.

2.2.5 A file room is a fire resisting enclosure of not more than 15 000 m³ capacity with a ceiling height of not more than 3.6 m. Fire resistance rating of a file room should be same as that of a vault.

2.2.6 Combustible filing cabinets/furniture are not permitted inside the file rooms.

2.2.7 When small quantities of valuable/vital/important records are to be stored, factory built record protection equipment, such as insulated record containers, fire-resistant safes of 2 h rating and insulated filing devices, may be used irrespective of the fire grading of the building in which such equipment is housed.

*Recommendations relating to primary elements in the design of library buildings.

†Recommendations relating to primary elements in the design of buildings for archives.

2.2.7.1 Factory built record protection equipment should be carefully selected in respect of its fire resistance rating, *vis-a-vis* the expected severity and duration of fire to which it may be liable to be exposed.

2.2.8 All photographic and magnetic records should be stored in suitable fire resisting cabinets of 2 h rating.

3. FIRE PRECAUTIONS

3.1 It is important that certain minimum precautions given in **3.1.1** to **3.1.5** are observed with a view to preventing an outbreak of fire and loss of books/records in libraries/archives.

3.1.1 Smoking should be prohibited throughout the library/archives, except in offices, rest rooms and canteens, where proper precautions should be enforced for disposal of spent smoking materials.

3.1.1.1 In buildings where only a portion of the building is used as a library or record room, smoking should be prohibited in all rooms/compartments where valuable, vital, important, or permanent records are kept; and in all other rooms/compartments where books are kept; and in all other rooms/compartments where large quantities of records are kept in open racks within the general office space.

3.1.1.2 "NO SMOKING" signs, painted in large readable letters on a contrasting background should be displayed conspicuously in or near each room/compartment. Each sign should also contain a pictograph.

3.1.1.3 Strict supervision should be exercised to prevent any infringement of smoking restrictions.

3.1.1.4 Wherever smoking is permitted, ashtrays should be provided and kept half filled with water. All ashtrays should be made from non-combustible materials filled with sand and their design should be such that when a lighted cigarette, cigar, etc, is left in the ashtray, it does not fall outside and endanger any combustible material; and the ashtray cannot be toppled accidentally.

3.1.2 Use of naked lights and other sources of ignition, such as electric heaters should be prohibited, except in offices.

3.1.2.1 Where use of electric heaters is permitted in offices, suitable precautions should be taken to ensure that the heaters do not pose any fire hazard. The precautions should include the following:

- a) The heater should be made from non-combustible materials and shall not incorporate any component made from plastic or similar materials.
- b) Design of the heater should be such that it cannot be toppled accidentally.

- c) Each heater should be fitted with a strong and efficient guard.
- d) The electric outlet should be provided as close as possible to the position where the heater is to be located during use.
- e) Only one appliance should be connected to each electrical outlet and the fittings shall conform to relevant Indian Standard.
- f) Flexible wire should under no circumstances be laid under the carpet or in a manner that can cause accidental tripping of any person passing over it.
- g) Flexible wire with frayed/damaged insulation should be replaced forthwith.
- h) Defective heaters should be removed from service until the fault is satisfactorily rectified. Such heaters shall be labelled 'DEFECTIVE, DO NOT USE'.
- j) All electric heaters, should be kept at a safe distance from all combustible materials to prevent ignition of such materials by the radiant/convective heat or by direct contact with the heater.

3.1.3 Use of portable electric table lamps should be restricted to offices only. Fixed adjustable lights should be provided for reading rooms. Portable electric table lamps should satisfy the following requirements:

- a) The electric table lamp should be made from non-combustible material and should not incorporate any combustible plastic lamp shade;
- b) Each table lamp shall have a heavy stable base so that it can not be toppled over accidentally;
- c) Precautions given in **3.1.2.1 (a) to (h)** for electric heaters should also be observed for portable electric table lamps; and
- d) Portable electric lamps on wandering load should not be used under any circumstances.

3.1.4 Use of open fire for heating office rooms during winters should be avoided, particularly where substantial quantities of records are also kept within the office space in open file racks.

3.1.4.1 If use of open fires is allowed for heating office rooms during winters, care should be taken to ensure that all combustible materials are kept at a safe distance from the fire place and the floor is of non-combustible nature.

3.1.4.2 Waste paper should not be discarded into the fire place.

3.1.5 Waste paper should be discarded in waste bin (baskets) only and not littered on the floor.

3.1.5.1 Waste paper bins (baskets) should be made from non-combustible material and each one of them should preferably be fitted with a pedal operated self-closing lid.

3.1.5.2 All waste paper baskets should be emptied and waste paper removed for safe disposal at the close of day's work.

3.1.6 Where considerable quantities of records are stored in open racks within the general office space, the work of sealing letters, documents, parcels, etc, with sealing wax, within that area should be avoided or strictly supervised to ensure that such work does not pose a fire hazard.

3.1.7 Books and (or) records should not be piled on the floor.

3.1.8 Where books/records are kept in steel almirahs within the general office space only such of the books/records and papers may be kept outside as may be required for current use and the almirahs shall be closed. All books/records and loose papers should be locked in almirahs at the close of day's work.

3.1.9 Where insulated recorded containers, fire-resistant safes and insulated filing devices, are provided for keeping records, no document should be taken out unless it is required for current use and, when no longer required, or at the close of day's work, all documents shall be locked up. In this case also, loose papers should not be left open in the office overnight.

3.1.10 In library/archives stock rooms and storage facilities and in rooms/compartments where considerable quantities of records are stored, adequate number of electrical outlets should be provided to enable the portable vacuum cleaning equipment to be used without necessitating long trailing leads.

3.1.11 Temporary wiring should not be permitted under any circumstances anywhere in the libraries/archives or in rooms/compartments used solely for the storage of books/records.

3.1.12 Any defect in the electrical installation should be immediately rectified and any fused electric lamp shall be promptly replaced.

3.1.13 Welding should not be permitted within a library/archives. However, if it is absolutely unavoidable provisions of IS : 3016-1982* should be strictly enforced.

*Code of practice for fire precautions in welding and cutting operations (*first revision*).

3.1.14 At the end of each day's work, just before the premises are closed for the night, a careful inspection should be undertaken of each room/compartment, where books, periodicals, records and other library/archives materials are kept/stored to ensure that no loose records/papers are lying around and there is no unusual smell/sign of smoke anywhere. All electrical switches, except the ones for security lights, should be put in the 'OFF' position and all doors properly secured before locking up.

4. FIRE DETECTION AND ALARM SYSTEMS

4.1 For minimization of losses due to fire, smoke and water (used for fire fighting), it is imperative that any outbreak of fire in libraries/archives/other records storage facilities is detected as early as possible so that fire suppression can commence promptly. The entire premises should, therefore, be protected with (i) an automatic fire detection and alarm system and (ii) manually operated electrical fire alarm system.

4.1.1 The automatic fire detection and alarm system should be so installed that an audio visual alarm, located at a central manned post, is actuated as soon as a fire is detected.

4.1.2 A telephone or other suitable means of rapid communication should be available at hand at the central manned post, so that the fire brigade can be alerted without delay. Alternatively, the detectors may be arranged to actuate an audio-visual alarm at the nearest public fire brigade station.

4.1.3 The automatic fire detection and alarm system should be installed in conformity with IS : 2189-1976*.

4.1.4 While selecting a suitable detector and deciding upon the spacing of detectors, *vis-a-vis* IS : 2189-1976*, it should be borne in mind that:

- a) until such time as the fire in books/records is well on the way, that is, for a considerable time in the beginning of a fire, books and paper records only smoulder and give off dense smoke; at the same time, the smouldering material can retain much heat;
- b) photographic and magnetic records generate dense smoke and much heat when involved in a fire;
- c) each bay formed by racks, within the room/compartment where books/records are stored shall be treated as a separate compartment for the purpose of spacing of detectors, where the gap between roof and rack is less than 230 mm;

*Code of practice for installation of automatic fire alarm system using heat sensitive type fire detectors (*first revision*).

- d) the direction in which smoke and hot gases travel from a fire in books/records storage is dependent upon the normal air current within the storage space; the air currents in turn are dependent upon the existence or otherwise of any air handling/air-conditioning system;
- e) because of the facts stated in (a) to (d) above, it is desirable to instal detectors on each bay of open rack storage in addition to the detectors installed under the ceiling over each aisle;
- f) the basic reason for installation of detectors is to ensure early detection and alert; and
- g) the system shall be fail-safe, that is, the detectors shall be of a reliable fail-safe design and the installation shall be wired in close circuit.

4.2 In vaults the installation of any automatic detection and alarm system is not necessary.

4.3 Where books/records are kept in general office space other than an office within regular library/archives, installation of detectors may be decided on merits of each case, taking into account the value of books/records, the mode of storage, etc. However, in multi-storeyed buildings with a height of over 15 m, automatic fire detection and alarm system should be installed.

4.4 Call boxes for the manually operated electrical fire alarm system should be of the break glass type, without any moving part, in which the alarm is transmitted instantly upon the breakage of a small glass panel without any other action in the part of the person actuating it.

4.4.1 All manual call boxes should be wired in a close-circuit.

4.4.2 Manual call boxes should be so located that one or the other box is readily accessible from each part of the building.

4.4.3 The manually operated electrical fire alarm system should also be arranged to give an audio-visual warning at the same central location as the automatic fire detection and alarm system.

4.5 The automatic fire detection and alarm system and the manually operated electrical fire alarm system should operate on batteries of adequate capacity, continuously trickle-charged *in-situ* from the electric mains.

3. FIRE SUPPRESSION

5.1 Libraries and archives should be equipped with suitable fire suppression systems and equipment both fixed and portable.

5.2 Fixed fire suppression systems may be automatic or manually operated. In both cases, a variety of such installations are available in so far as the extinguishing media are concerned. The decision about the installation of any particular type of fixed fire extinguishing system depends on the value of books/records and other library/archival materials, *vis-a-vis* the economics of protection. The method of storage is also a determining factor. The choice also depends upon each situation, local preferences the degree of sophistication and degree of occupancy desired. Broad guidelines are indicated in 5.2.1 to 5.2.4.

5.2.1 Sprinklers — In view of the fact that the extinguishing medium used in sprinklers is water. The following should be taken into consideration to arrive at a decision:

- a) Sprinklers actuated in the early stages of a fire can localize the fire and prevent it from spreading.
- b) Though the books/records directly involved in the fire may get destroyed and those drenched with water from the sprinklers may suffer some water damage, the bulk of them can be saved. There is also a good possibility of salvaging books/records damaged by water if immediate action is taken after extinction of fire.
- c) A sprinkler installation is comparatively more economical than those employing other extinguishing media.
- d) When books/records are stored in steel almirahs or in factory built records protection devices, sprinklers alone are best suited to control the external fire speedily. In this case, no water damage results from the operation of sprinklers.
- e) Sprinklers are unsuitable for vaults and are, therefore, unsuitable for such application.

5.2.2 Carbon Dioxide Systems (*see* IS : 6382-1985*) — Carbon dioxide systems of the total flooding type can be very effective on fires in books/records if the system is properly designed and installed. The merits and demerits of such systems are as follows:

- a) The rate of discharge from a total flooding type fixed carbon dioxide fire extinguishing system is high and effective concentration of the gas can be maintained for an extended period to ensure complete extinction.
- b) Carbon dioxide gas does not damage the records. The only action necessary after the fire is, therefore, to sort out and salvage those records that may have actually been affected by the fire.

*Code of practice for design and installation of fixed carbon dioxide fire extinguishing system (*first revision*).

5.2.3 Halon Systems* — These systems usually employ Halon 1301 (Bromotrifluoromethane) in liquefied form under pressure. The merits and demerits of these systems are as follows:

- a) Halon is more effective as compared to carbon dioxide, and
- b) It does not damage the books/records.

5.2.4 High-Expansion Foam Systems — High expansion foam is capable of successfully controlling fires in books/records at speeds comparable to sprinklers. Its merits and demerits are as follows:

- a) Because of its very low water content, water damage to any single item is low.
- b) Since the entire room/compartment shall be filled with high expansion foam for achieving complete extinction, the 'low' water damage is spread over to all items in the room and extensive salvage operations are necessary immediately after the fire is extinguished.

5.3 Water Supply and Fixed Manually Operated Fire Extinguishing System — Irrespective of the type of fixed automatic fire extinguishing system that may be installed fire hydrants and first-aid hose reels should also be installed both indoors and outdoors, because water is still necessary in plentiful supply for extinguishing any fire that may otherwise burn unabated.

5.3.1 Where the library/archives constitutes a part of an industrial establishment and is located within the factory premises, water for fire fighting may be provided in the same manner as for the factory, that is, though fire hydrants or static water tanks.

5.3.2 In all other cases, it may not be possible to ensure plentiful water supply round-the-clock through fire hydrants unless uninterrupted municipal/public water supply is available at good pressure through water mains. In such cases:

- a) the possibility of tapping natural sources of water, if any, close to the library/archives should be explored; or
- b) if no natural source is available static water tanks should be provided, for the storage of water for fire fighting, close to the library/archives.

5.3.3 For further guidance on water supply for fire fighting, reference may be made to IS : 9668-1980†.

*Relevant Indian Standard is under preparation.

†Code of practice for provision and maintenance of water supplies for fire fighting.

5.4 Fire Extinguishers — Portable fire extinguishers of appropriate type(s) should be provided and maintained throughout the building(s) in accordance with the guidelines given in **5.4.1** to **5.4.2**.

5.4.1 Fire extinguishers should be selected and installed in accordance with IS : 2190-1979*.

5.4.2 Fire extinguishers should be distributed in accordance with IS : 2190-1979*. The guiding principle is that fire extinguishers should be readily available so that these can be used without delay in the initial stages of fire.

6. MAINTENANCE

6.1 The fire detection and alarm installations and fire suppression systems/equipment should be maintained in serviceable condition at all times.

6.1.1 Building(s) should be maintained in such a manner that horizontal and vertical fire compartmentation are not disturbed or adversely affected at any time. Particular attention should be paid to the continuity and repairs of all walls and floors and the fire/smoke check doors. It should be ensured that the doors are not wedged open and the door closers function effectively.

6.1.2 Fire detection and alarm systems should be periodically tested at intervals not exceeding one week and defects rectified promptly. Batteries should also be checked at the same periodicity.

6.1.3 All fixed fire suppression installations should be maintained in good repairs.

6.1.4 All water supply sources should be inspected once a week and replenished as necessary.

6.1.5 All portable fire extinguishers should be inspected and maintained according to IS : 2190-1979*.

7. EMERGENCY ORGANIZATION

7.1 An emergency organization should be set up with participation of all employees for action during a fire emergency.

7.1.1 Detailed orders should be drawn up for action to be taken and responsibility of all individuals in the event of a fire and copies should be made available to all concerned.

*Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers (*second revision*).

IS : 11460 - 1985

7.1.2 Extracts from emergency orders should be conspicuously displayed in each room/compartment.

8. TRAINING

8.1 All members of staff of the library/archives should be trained in action to be taken in the event of an outbreak of fire and in the operation and user of first aid hose reels and fire extinguishers.

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154

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26 28 08

First Floor, Plot Nos. 657-660, Market Yard, Gultekdi, PUNE 411037

426 86 59

'Sahajanand House' 3rd Floor, Bhaktinagar Circle, 80 Feet Road, RAJKOT 360002

37 82 51

T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034

32 21 04

*Sales Office is at 5 Chowringhee approach, P. O. Princep Street, KOLKATA 700072

237 10 85

†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007

309 65 28