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NATIONAL FIRE PROTECTION ASSOCIATION, INC.
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Standard for the Protection of Electronic Computer/Data Processing Equipment

NFPA 75-1981

1981 Edition of NFPA 75

This edition of NFPA 75, *Standard for the Protection of Electronic Computer/Data Processing Equipment*, was prepared by the Technical Committee on Electronic Computer Systems and acted on by the National Fire Protection Association, Inc. on May 19, 1981, at its Annual Meeting in Dallas, Texas. It was issued by the Standards Council with an effective date of June 29, 1981.

The 1981 edition of this standard has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

This edition is a reconfirmation of the 1976 edition with some minor changes.

Origin and Development of NFPA 75

The Committee on Electronic Computer Systems was formed by the action of the NFPA Board of Directors in January, 1960, following a request for standardization of fire protection recommendations by the computer industry.

The Committee first submitted the *Standard for the Protection of Electronic Computer Systems* to the 1961 NFPA Annual Meeting and it was tentatively adopted. At the 1962 Annual Meeting it was officially adopted as an NFPA standard. Revisions were adopted in 1963, 1964, 1968, and 1972 and it was completely revised in 1976.

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NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or of any document developed by the Committee on which the member serves.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Appendix D.

Chapter 1 Introduction

1-1 Scope.

1-1.1 This standard covers the requirements for installations of electronic computer/data processing equipment where either:

(a) Special building construction, rooms, areas, or operating environment are required, or

(b) Fire protection for the equipment is required.

1-1.2 This standard presently does not cover installations of electronic computer/data processing equipment which can be made without this special construction or protection.

1-1.3 This standard, however, may be used as a management guide for the installation of electro-mechanical data processing equipment, small table top or desk type units and electronic computer/data processing equipment that do not require special construction or protection. Special attention is directed to 5-1.1, 5-1.2, 5-5.1, and Chapter 6. Chapter 6 is particularly important as the value of the records to the continuity of operations may far outweigh the importance of the equipment.

1-2 Purpose. The purpose of this standard is to set forth the minimum requirements for the protection of electronic computer/data processing equipment from damage by fire or its associated effects.

1-3 General. Electronic computer/data processing equipment has become a vital and commonplace tool for business, industry, government, and research groups in recent years. The use of such equipment is a direct result of the technological breakthroughs which have made the equipment available and the increased complexity of modern business, industrial, governmental, and research needs. Particularly pertinent are the increasing number of variables which must be taken into consideration in everyday decisions — overlooking any one item may spell the difference between profit and loss, success or failure, life or death. To keep track of all these variables, electronic computer/data processing equipment offers practical answers.

This equipment is being used on an ever increasing basis to process large amounts of statistical, problematical, or experimental information, and to print out or display answers or information in very short periods of time. More and more reliance is being placed on the equipment to perform the repetitive, the experimental, and in some cases, even the whole programming operation for business, industry, government, and research groups.

Much has been written on the procedural steps required for study before installing electronic computer/data processing equipment. These requirements embrace selection of proper equipment, checking and planning for areas to receive the equipment, utility requirements, orientation and training of personnel to operate the equipment, as well as consideration for expansion of the initial facility. One other factor shall be included in this vital study— namely, protection against fires of either accidental or deliberate origin.

In addition to the hazards of fires from accidental causes, many computers and data processing installations have become prime targets for sabotage and arson.

Oftentimes, the strategic importance placed upon electronic computer/data processing equipment by the user is vitally tied to uninterrupted operation of the system. Consequently, by the partial or entire loss of this equipment, an entire operation of vital nature could be temporarily paralyzed.

Not to be overlooked are the "one-of-a-kind" electronic computer/data processing systems. These are the "custom-made" models that are designed to perform specific tasks. Replacement units for this type of equipment are not available and the probability of the existence of duplicate facilities, which could be used to perform vital operations in the event the "one-of-a-kind" system is partially or totally impaired by a fire, is remote.

Computer equipment and materials for data recording and storage may incur damage when exposed to elevated sustained ambient temperatures. The degree of such damage would be variable

depending upon exposure, equipment design and the composition of materials for data recording and storage. The following are guidelines reflecting concernable sustained ambient temperatures:

(a) Damage to computer equipment may begin at a sustained ambient temperature of 175 °F (79.4 °C), with the degree of damage increasing with further elevations of the ambient temperature and exposure time.

(b) Damage to magnetic tapes, flexible discs, and similar materials may begin at sustained ambient temperatures above 100 °F (37.8 °C). However, damages occurring between 100 °F (37.8 °C) and 120 °F (48.9 °C) can generally be reconditioned successfully where the chance of successful reconditioning lessens rapidly with elevations of sustained ambient temperatures above 120 °F (48.9 °C).

(c) Damage to disc may begin at sustained ambient temperatures above 150 °F (65.6 °C) with the degree of damage increasing rapidly with further elevations of sustained ambient temperature.

(d) Damage to paper products (including punched cards) may begin at a sustained ambient temperature of 350 °F (176.7 °C). Paper products which have not become brittle will generally be salvageable.

(e) Damage to microfilm may begin at a sustained ambient temperature of 225 °F (107.2 °C) in the presence of steam or at 300 °F (154.4 °C) in the absence of steam.

Planning for fire protection is vital due to an organization's dependence upon the electronic computer/data processing equipment. Once management commits itself to a program of dependence on any such equipment, simple economics dictates doing away with former methods and procedures. The personnel, equipment, and facilities are no longer available to pick up the load assumed by the data processing equipment if it is put out of operation by fire or other unforeseen occurrences. Often, the major cost involved to management by disruption of the computer operation is from business interruption rather than from the actual monetary loss represented by the equipment itself, although the latter may run into millions of dollars.

There are three major areas where judgment will be required in the application of this standard. They are:

(a) Is this equipment important?

This is a judicious evaluation based on both what the equipment is and what it does. If it controls air traffic safety it can be vital to human life; if it controls corporate information it can be vital to business "life," but if its loss would be simply inconvenient, then, perhaps, it is not important even though expensive.

(b) Does this equipment need special construction?

When special construction is needed in an important computer installation, it is essential that this construction of itself provide a safe environment for the equipment.

(c) What is the exposure to the equipment?

Exposure to destruction can come from within a computer cabinet, from within the equipment room, from the immediate area around the data processing room, from the floors above and below the computer, and from outside of the building in which the equipment is located. This exposure can be evaluated and then controlled as needed.

The application of this standard to the protection of an individual system will depend upon the answers to these three questions.

While this standard cannot cover all contingencies with hard and fast rules, it does give an indication of the major areas of consideration and will provide a basis for an intelligent evaluation of fire protection requirements. There is no substitute for informed consideration of common sense principles.

1-4* Definitions. Unless expressly stated elsewhere, the following terms shall, for the purpose of this standard, have the meanings indicated below.

Approved. Means "acceptable to the authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Associated Effects. Smoke, corrosion, heat, water.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau,

labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Business Interruption. The effect on business operations from the time that equipment was initially lost or damaged until it has been restored to the former level of operation.

Console. A unit containing main operative controls of the system.

Easily Accessible.* When the covers, panels, doors or other enclosure for the electronic components within the equipment or the flooring can be removed or opened by quick, simple operations to expose any area which might be involved in fire and permit the application of an extinguishing medium.

Electro-Mechanical Processing Equipment. Individual units which are not electronic in nature and do not constitute a system or complete a total function.

Electronic Computer System.* Any electronic digital or analog computer, along with all peripheral, support, memory, programming or other directly associated equipment, records, storage and activities.

Electronically Interconnected. Units that must be connected by a signal wire to complete a system or perform an operation.

Fire-Resistant Construction. That type of construction in which the structural members, including walls, partitions, columns, floors and roof construction, have fire resistance ratings of time duration not less than that specified in this standard.

Heat Detector. A device which detects abnormally high temperature or rate-of-temperature rise.

Input-Output (I/O). That equipment associated with the computer which feeds and/or receives data.

Interconnecting Cables. Signal and power cables for operation and control of system (usually supplied by computer manufacturer).

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Master Record. A record of information on a medium which can be referred to whenever there is a need to rebuild a program.

Noncombustible. Will not burn.

Progam. Instructions to direct system operation.

Raised Floor. A platform with removable panels on which machines are installed, with the intervening space between it and the mainbuilding floor used for housing the interconnecting cables and at times as a means for supplying conditioned air to the data processing machines and the room. (Sometimes it is referred to as a false floor or secondary floor.)

Readily Replaced. The ability to replace a part in a time equal to or less than the time required to correct a normal electrical defect.

Separate Fire Division.* A portion of a building cut off from all other portions of the building by fire walls, fire doors and other approved means adequate to prevent any fire which may occur in the building from causing damage to more than one such separate fire area.

Shall. Indicates a mandatory requirement.

Should. Indicates recommendations or that which is advised but not required.

Smoke Detector. A device which detects the visible or invisible particles of combustion.

Supervision. Continuous surveillance of a system or operation by special supervisory equipment or personnel to alert those responsible that failure has occurred or that a hazardous condition is being approached.

Chapter 2 Construction Requirements

2-1 Primary Building Construction.

2-1.1 The computer area shall be housed in a fire-resistant, noncombustible or sprinklered building, except as noted in 2-1.2.

2-1.2 When a section of a nonfire-resistant structure housing a computer area is a separate fire division, that section of the structure housing the computer area shall comply with 2-1.1.

2-2* Prerequisites for Location of Computer Area Within the Primary Building.

2-2.1 The electronic computer area shall be located to minimize exposure to fire, water, corrosive fumes, heat, and smoke from adjoining areas and activities.

2-2.2 The computer room shall not be located above, below or adjacent to areas or other structures where hazardous processes are located unless adequate protective features are provided.

2-3 Computer Area Perimeter Construction and Fire Cutoffs and/or Remodeling.

2-3.1 Where exposure to the building housing the computer is unfavorable, exposure protection shall be provided. This protection shall consist of blank masonry walls, or other suitable exposure protection, depending upon local conditions (*see NFPA 80A, Protection from Exposure Fires*).

2-3.2 The computer room shall be cut off from other occupancies within the building by fire-resistant rated walls, floor and ceiling. The fire resistance rating shall be commensurate with the exposure, but not less than one hour (*see Appendix C*).

2-3.3 The fire-resistant walls or partitions enclosing the computer room and/or storage rooms shall extend from the structural floor to the structural floor above, or the roof.

2-4 Computer Area Interior Construction.

2-4.1* All materials used in construction within cut-off areas, including walls, floors, partitions, finish, acoustical treatment, raised floors, suspended ceilings, and other construction involved in the computer room, shall have a flame-spread rating of 25 or less (*see*

NFPA 255, Method of Test of Surface Burning Characteristics of Building Materials).

Exception : Resilient tiles or high-pressure plastic laminates may be used as the wearing surface on any exposed floors. Carpeting is permitted if it is demonstrated that the proposed material will not contribute to the spread of fire, is not readily ignited by sparks or burning embers, and does not restrict lifting of panels for access to the underfloor space.

2-4.1.1 Exposed cellular plastics shall not be used in computer room construction.

2-4.2* A structural floor on which a computer system is located, or which supports a raised floor installation shall incorporate provisions for drainage of the floor surface to minimize damage to the system and associated wiring due to domestic water leakage, sprinkler operation, coolant leakage, or fire fighting operations.

2-5 Raised Floors.

2-5.1 Structural supporting members for raised floors shall be of concrete, steel, aluminum, or other noncombustible material.

2-5.2 Decking for raised floors shall be one of the following:

(a) Concrete, steel, aluminum, or other noncombustible material, or

(b) Pressure impregnated, fire-retardant treated lumber having a flame spread rating of 25 or less (*see NFPA 255, Method of Test of Surface Burning Characteristics of Building Materials*), or

(c) Wood or similar core material which is encased on the top and bottom with sheet, cast or extruded metal, with all openings or cut edges covered with metal or plastic clips or grommets so that none of the core is exposed, and has an assembly flame spread rating of 25 or less. (*See NFPA 255, Method of Test of Surface Burning Characteristics of Building Materials.*)

2-5.3 Existing combustible raised floors shall be replaced with construction meeting the requirements of 2-5.1 and 2-5.2, or

(a) An automatic detection system shall be installed in the space below the raised floor. This additional automatic detection system shall meet the requirements of 5-2.1 and shall sound an audible and visual alarm; and

(b) Air space below the raised floor shall be subdivided into areas not exceeding 10,000 sq ft (929 sq m) by tight noncombustible bulkheads.

2-5.4 Access sections or panels shall be provided in raised floors so that all the space beneath is easily accessible.

2-5.5 Electric cable openings in floors shall be made smooth or shall be otherwise protected to preclude the possibility of damage to the cables.

2-5.6 Opening in raised floors for electric cables or other uses shall be protected to minimize the entrance of debris or other combustibles beneath the floor.

NOTE: This may be accomplished by noncombustible covers, grilles, screens, or by locating equipment directly over the opening.

2-6 Cable Openings and Other Penetrations.

2-6.1 Cable openings or other penetrations into the computer area shall be sealed with material meeting the requirements of 2-3.2.

2-7 Plenums.

2-7.1 When the air space below a raised floor or above a suspended ceiling is used as a supply or return for air conditioning, the construction shall be noncombustible, and all wiring shall be of a listed type.

Chapter 3 General Computer Room Requirements

3-1 Materials and Equipment Permitted in the Computer Room.

3-1.1 Except as noted below, only the actual electronic computer equipment and such input-output or other auxiliary electronic equipment electronically interconnected with the computer, or which must be located in close proximity to the electronic computer equipment, shall be permitted within the computer room itself.

Exception No. 1: Small supervisory offices and similar light hazard occupancies directly related to the electronic equipment operations may be located within the computer room if adequate facilities are provided for containing the necessary combustible material.

Exception No. 2: Records may be kept in the computer room to the extent allowed in Chapter 6.

3-1.2 All office furniture in the computer room shall be of metal construction or of other materials that do not contribute significantly to the combustible contents.

3-1.3 The following shall not be permitted within the computer room:

(a) Any activity or occupancy not directly associated with the electronic computer system(s) involved.

(b) Supplies of combustibles such as paper, corrugated boxes, cards, inks, or equivalent printing materials, in excess of that needed for efficient operation.

(c) Service and repair shops and operations except for that servicing and repairing performed directly on machines which are impractical to remove from the computer room.

(d) Bulk storage of records (*see Chapter 6*).

(e) Any other combustible material, equipment or operation which constitutes a hazard and which can be removed.

3-2 General Storage.

3-2.1 Paper stock, unused recording media, and other combustibles within the computer room shall be restricted to the absolute minimum necessary for efficient operation. Any such materials in the

computer room shall be kept in totally enclosed metal file cases or cabinets, or if provided for in individual machine design, shall be limited to the quantity prescribed and located in the area designated by the equipment manufacturer.

NOTE: The operation of an electronic computer system frequently requires considerable quantities of stationery supplies and other combustible support materials. This material can present a serious fire exposure within the computer room capable of causing serious damage to vital equipment or records.

3-2.2 Reserve stocks of paper, unused recording media, and other combustibles shall be stored in one or more rooms outside of the computer room.

Chapter 4 Construction of Computer Equipment

4-1 Computer Equipment.

4-1.1* Each individual unit shall be constructed so that by limiting combustible materials, or by use of enclosures, fire is not likely to spread beyond the unit in which the source of ignition is located. Enclosures of floor standing equipment having external surfaces of combustible materials of such size that might contribute to the spread of an external fire shall have a flame spread rating of 50 or less (*see NFPA 255, Method of Tests of Surface Burning Characteristics of Building Materials*). Automatic protection shall be provided for all units not so constructed (*see Chapter 5*).

4-1.2 Listed equipment shall be considered as meeting the requirements of 4-1.1.

4-1.3 Equipment meeting the requirements of UL Standard No. 478 shall be considered as meeting the requirements of 4-1.1.

4-2 Construction Features.

4-2.1 Cables. Interconnecting cables and wiring between units, power cords, plugs, and connectors shall be of a listed type. They shall be considered as part of the computer system and suitable for installation on the floor or under a raised floor as described in Section 2-5.

4-2.2 Cords. Approved flexible cord and plug assemblies used for connecting computer equipment to the branch circuit to facilitate interchange shall not exceed 15 ft (4.57 m) in length.

4-2.3 Filters. Air filters for use in the cooling systems of individual units shall be a listed type that will not burn freely or emit a large volume of smoke or other objectionable products of combustion when attacked by flames. They shall be so arranged that they can be readily removed, inspected, cleaned or replaced when necessary.

4-2.4 Liquids. If the design of the unit is such that oil or equivalent liquid is required for lubrication, cooling or hydraulic purposes, it shall have a closed cup flash point of 300°F (149°C) or higher, and the container shall be of a sealed construction, incorporating automatic pressure relief devices.

4-2.5 Acoustical Materials. All sound deadening material used inside of computer equipment shall be of such material or so arranged that it does not increase the potential of fire damage to the unit or the potential of fire propagation from the unit.

Chapter 5 Protection of Computer Rooms and Equipment

5-1 Portable Extinguishers and Hose Lines.

5-1.1* Listed portable carbon dioxide, Halon 1301, or Halon 1211 extinguishers shall be provided and maintained for electrical fires (*see NFPA 10, Standard for Portable Fire Extinguishers*).

5-1.2 Listed Class A extinguishers of plain water type only shall be provided and maintained for use on fires in ordinary combustible materials, such as paper and plastics.

5-1.3 A sign shall be located adjacent to each portable extinguisher and shall plainly indicate the type of fire for which it is intended.

5-1.4 In installations where conditions may require the provision of inside hose, it shall be 1½-in. (3.81-cm) rubber-lined hose with shutoff and combination solid stream and water spray nozzles. They shall be installed and maintained in accordance with NFPA 14, *Standpipe and Hose Systems*.

5-1.5 In installations where conditions may require the provision of carbon dioxide hand hose lines, they shall be installed and maintained in accordance with NFPA 12, *Carbon Dioxide Extinguishing Systems*.

5-2 Automatic Detection Systems.

5-2.1 Automatic detection equipment shall be installed to provide early warning of fire. The equipment used shall be a listed smoke detection type. Each installation shall be engineered for the specific area to be protected, giving due consideration to air currents and patterns within the space and shall be installed and maintained in accordance with NFPA 72E, *Automatic Fire Detectors*.

5-3 Halon 1301 Total Flooding Systems.

5-3.1 Where there is a critical need to protect data in process, reduce equipment damage, and facilitate return to service, consideration shall be given to the use of Halon 1301 total flooding systems in sprinklered or unsprinklered computer rooms.

5-3.2 In installations where Halon 1301 Total Flooding Systems are used, they shall be installed and maintained in accordance with the requirements of NFPA 12A, *Halon 1301 Fire Extinguishing Systems*.

5-3.3 Halon 1301 Systems shall be automatically actuated by an approved method of detection, meeting the requirements of NFPA 72E, *Automatic Fire Detectors*. To ensure detection, particular attention shall be given to the choice of actuation means, the air flows usually involved in such air handling systems, and the small heat release under fire conditions.

NOTE: The Halon 1301 System may be actuated by the automatic fire detection system required in 5-2.1.

5-3.4 Where operation of the air conditioning system would exhaust the agent supply, the Halon 1301 System shall be interlocked to shut down the air conditioning when the Halon system is actuated.

NOTE: It is not necessary to de-energize computer equipment prior to discharge.

5-3.5 Alarms shall be provided to give positive warning of a discharge or pending discharge.

5-4 Automatic Sprinkler Systems.

5-4.1 An automatic sprinkler system shall be provided to protect the computer room when:

(a) The computer room construction contains any combustible materials other than permitted in 2-4.1, or

(b) The enclosure of a unit in a computer system, or the unit structure, is built all or in part of a significant quantity of combustible materials, or

(c) The operation of the computer room involves a significant quantity of combustible materials.

5-4.2* Automatic sprinkler systems protecting computer rooms or computer areas shall be installed in accordance with NFPA 13, *Installation of Sprinkler Systems*.

NOTE: To minimize damage in electronic computer equipment located in sprinkler protected areas, it is important that power be off prior to the application of water on the fire.

5-5 Training.

5-5.1 Designated persons working in the computer area shall be thoroughly trained in the functioning of all detector equipment, desired response to alarm conditions and the use of all available extinguishing equipment. This training shall encompass both the capabilities and limitations of each available type of extinguisher.

5-6 Expansion or Renovations. Whenever significant changes are made to the size or configuration of the computer room (e.g., installation of new or partial partitions), the potential impact on existing fire detection and protection shall be evaluated.

Chapter 6 Protection of Records

6-1* General.

6-2* Record Media.

6-3* Types of Records.

6-4 Classification of Records.

6-4.1 The evaluation of records shall be a joint effort of all parties concerned with the safeguarding of computer operations. The amount of protection provided for any record shall be directly related to its importance in terms of the mission of the computer system and the reestablishment of operations after a fire.

NOTE: It is assumed that computer equipment capable of properly using the records will be available.

6-4.2 Records Classes. The following record classes are based on recommendations of NFPA 232, *Protection of Records*:

(a) *Vital Records.* Vital records are those which are irreplaceable, such as: records of which a reproduction does not have the same value as an original; records needed to sustain the business promptly or to recover monies with which to replace buildings, equipment, and raw materials, finished goods and work in process; and records needed to avoid delay in restoration of production, sales and service.

(b) *Important Records.* Important records are those of which a reproduction could be obtained only at considerable expense and labor or only after considerable delay.

(c) *Useful Records.* Records whose loss might occasion much inconvenience but which could readily be replaced and which would not be an insurmountable obstacle to prompt restoration of operations. Programs and procedures retained as examples of special problems are typical of records in this category.

6-5 Duplication of Records.

6-5.1 All vital and important records shall be duplicated or protected in accordance with NFPA 232, *Protection of Records*. Duplicate records shall be stored in an area which is not subject to a fire or its associated effects that may involve the originals.

6-6 Protection Required.

6-6.1 Records Kept Within the Computer Room.

6-6.1.1 The amount of records kept within the computer room shall be kept to the absolute minimum required for efficient opera-

tion. Records that are nonessential shall not be kept in the computer room.

6-6.1.2 Any records regularly kept or stored in the computer room shall be provided with the following protection:

(a) Vital or important records which have not been duplicated shall be stored in approved Class 150 one-hour or better record protection equipment.

(b) All other records shall be stored in closed metal files or cabinets.

6-6.2 Records Stored Outside of the Computer Room.

6-6.2.1 Record Storage Rooms.

(a) Vital and important records that have not been duplicated shall be stored in fire-resistive rooms. The degree of fire resistance shall be commensurate with the fire exposure to the records, but not less than two hours (*see 6-5.1*).

NOTE: Useful records do not require any special fire protection unless these records are stored with vital or important records. In such case the requirements for the most valuable records apply to all records.

(b) Unless the records are contained in closed metal files, cabinets or other noncombustible containers, records storage rooms shall also be provided with an automatic sprinkler system or automatic 1301 total flooding Halon System in accordance with Section 5-3.

(c) The records storage room shall be used only for the storage of records. All other operations including splicing, repairing, erasing, reproducing, cataloging, etc., shall be prohibited in this room.

Exception: Spare tapes may be stored in this room if they are unpacked and stored in the same manner as the tapes containing records.

6-6.2.2 The limitations on the size of the record storage rooms shall be based upon the type of records and level of protection, as follows:

(a) Rooms containing plastic based records in combustible containers shall not exceed 10,000 cu ft (283.2 cu m).

(b) Rooms containing plastic based records in noncombustible containers shall not exceed 20,000 cu ft (566.4 cu m).

(c) Rooms containing only paper records shall not exceed 50,000 cu ft (1416 cu m).

NOTE: Limitations on storage rooms with automatic sprinkler system, or automatic total flooding Halon 1301 System protection in (a), (b), and (c) may be doubled in size.

6-6.2.3 Portable extinguishing equipment and hose lines for record storage rooms or area shall be installed in accordance with 5-1.1, 5-1.2, 5-1.3, and 5-1.4.

6-6.3 When records are kept in supply cabinets, or other containers, protection shall be that required for the highest level of damageable media in the total assembly of records and containers.

Chapter 7 Utilities

7-1 Air Conditioning and Coolant Systems.

7-1.1 Air conditioning equipment shall conform to the requirements of NFPA 90A, *Air Conditioning and Ventilating Systems*, and to the additional requirements in 7-1.2 through 7-1.5.

NOTE: A separate air conditioning system should be provided for the computer area.

7-1.2 If the air conditioning system for the computer room also serves other areas, dampers to protect against both smoke and fire shall be provided in the ductwork at all penetrations through the computer room fire cut-off.

7-1.3 Air ducts serving other areas either shall not pass through the electronic equipment area, or suitable fire dampers shall be provided in the ducts as outlined in NFPA 90A, *Air Conditioning and Ventilating Systems*.

7-1.4 All duct insulation and linings shall be noncombustible, including vapor barriers and coatings.

7-1.5* Air filters for use in air conditioning systems shall be listed types that will not burn freely or emit a large volume of smoke or other objectionable products of combustion when attacked by flames. They shall be so arranged that they can be readily inspected and cleaned or replaced when necessary.

7-2 Electrical Service. (*See Appendix B.*)

NOTE: The requirements in this section apply to all power and service wiring supplying the electronic computer equipment. They do not apply to wiring and components within the actual equipment or to wiring connecting various units of equipment. The equipment and interconnected wiring requirements are set forth in Chapter 4.

7-2.1 Service equipment supplying the main power requirements of the computer room area shall be of a type arranged for remote control or located to fulfill the requirements of 7-3.1.

7-2.2 All wiring shall conform to NFPA 70, *National Electrical Code*.®

7-2.3 If a service transformer must be installed in the computer area, it shall be of the dry type or the type filled with a nonflammable dielectric medium. Such transformers shall be installed in accordance with the requirements of NFPA 70, *National Electrical Code*.

NOTE: Service transformers should not be permitted in the electronic computer room.

7-2.4 Protection against lightning surges shall be provided where needed in accordance with the requirements of NFPA 70, *National Electrical Code*.

7-2.5 The number of junction boxes in underfloor areas shall be kept to a minimum. Where used, they shall be metal, completely enclosed, easily accessible, properly grounded and in compliance with the *National Electrical Code* requirements as to construction. They shall be securely fastened. No splices or connections shall be made in the underfloor area except within junction boxes or approved type receptacles or connectors.

7-3 Emergency Power Controls.

7-3.1 A disconnecting means shall be provided to disconnect the power to all electronic equipment in the computer room. This disconnecting means shall be controlled from locations readily accessible to the operator at the principal exit doors. There shall also be a similar disconnecting means to disconnect the air conditioning system serving this area.

NOTE: Provision should be made for emergency lighting.

7-4 Coolant Systems.

7-4.1 If a separate coolant system is required for operation of a computer installation, it shall be provided with a suitable alarm to indicate inadvertent loss of fluid.

Chapter 8 Emergency Procedures

8-1* Preplanning for Continued Operation in an Emergency.

8-2* Emergency Fire Procedure.

8-3* Damage Control.

Appendix A

This Appendix is not part of this NFPA standard but is included for information purposes only.

A-1-4 Easily Accessible. Preferably no special tool or other removable device should be required to perform this operation. Where safety from electrical shock requires the extra security for electronic components, a simple tool may be required provided the tool is kept in a convenient location on or near the machine. Quick removal of the machine enclosure means that any component can be exposed in not over one minute. Where a special tool or device is required to assist in facilitating accessibility to underfloor areas, the number and arrangements of the devices should be such that any space beneath the floor can be exposed to application of the extinguishing media in not over one and one-half minutes.

A-1-4 Electronic Computer System. The most common types of electronic computer systems are of the digital computer type and are usually classed as Electronic Data Processing Machines (EDPM), Automatic Data Processing Machines (ADPM), and/or Integrated Data Processing systems.

A-1-4 Separate Fire Division. In nonfire-resistant buildings, this includes protection against building collapse as the result of a fire outside the separate fire area.

A-2-2 Security. Many computer and data processing installations have become prime targets for sabotage and arson. The location and construction should be designed to minimize the possibility of penetration by an explosive or incendiary device. It is essential that access be restricted to only those persons absolutely necessary to the operation of the equipment. A controlled-access system of admittance through positive identification should be maintained at all times.

A-2-4.1 Fire protection authorities generally prefer that hard surfaced materials be used on computer room floors and object to most carpeting. Because of the need in some computer rooms for special floor coverings, a useful guide for selection is the Underwriters Laboratories Inc. *Standard Method of Test for Flame-Propagation Classification of Flooring and Floor Covering Materials* (Subj. 992).

A-2-4.2 In multistoried buildings, the floor above the computer room should be made reasonably watertight to avoid water damage to equipment. Any openings including those for beams and pipes should be sealed to watertightness.

A-4-1.1 All non-electrical parts, such as housings, frames, supporting members, and the like, should not constitute additional fire hazard to the equipment.

A-5-1.1 If it is desired to provide other types of extinguishers, advice should be obtained from the computer equipment manufacturer and the authority having jurisdiction as to their acceptability.

A-5-4.2 Automatic sprinkler systems protecting computer rooms or computer areas should be maintained in accordance with NFPA 13A, *Care and Maintenance of Sprinkler Systems.* In facilities which are under the supervision of an operator, or other person familiar with the equipment (during all periods that equipment is energized), the normal delay between the initial outbreak of a fire and the operation of a sprinkler system will provide adequate time for operators to shut down the power by use of the emergency shutdown switches as prescribed in 7-3.1. In other instances where a fire may operate sprinkler heads before discovery by personnel, a method of automatic detection should be provided to automatically de-energize the electronic equipment as quickly as possible.

Sprinkler systems protecting computer rooms should be valved separately from other sprinkler systems.

A-6-1 The operation of most electronic computer systems involves obtaining, using, creating and storing large amounts of records. In many operations these records are as important to the continuity of the operation and its mission as the computer itself.

A-6-2 Records may be the commonly encountered paper records, punch cards, plastic or metal base electronic tapes (on metal or plastic reels and in metal, plastic or cardboard containers), paper, control panels, magnetic discs, memory drums, memory cores or various other means of maintaining for future use information in plain or machine language, inside or outside of electronic equipment. Some of these records such as magnetic discs, memory drums and memory cores are usually found as an integral portion of electronic equipment and as such the protection of these records is covered in Chapter 5.

A-6-3 Records involved in computer operations fall into five basic types which must be safeguarded according to their importance and the difficulty involved in their replacement as follows:

Input Data. Raw or partially refined information to be entered into the computer system, either as memory for later use or for immediate use in the solution of a problem, development of a statistic or production of some other product.

Memory. Information previously converted to language or symbols immediately recognizable to the computer equipment and held for future use. Memory may be on any media which can be directly read by the computer system.

Program. Data, which may be on paper, punch cards, photographic, magnetic or electronic media, used to direct the computer as to which input or memory data to use, how to use it and the type of results to obtain. Also to be considered are any diagrams or other records which can be used to reproduce programs.

Output Data. The final product of the computer system. This may consist of printed material or electronic data.

Engineering Records. Those plans, specifications, and other records which provide the engineering record of the construction, wiring, and arrangement of the computer system and its housing area. Of particular importance are records of modification made following the original installation.

A-7-1.5 Electric reheat units can collect dust over a period of time. When heat is applied after several months of non-use, a significant amount of dust and lint may accumulate on the heating elements and, when the elements are energized, may cause sufficient smoke particles to actuate a sensitive smoke detector in the smoke exhaust (air discharge) area. These reheat units should be set up with a weekly timer circuit to "burn off" the small amounts of dust which have collected, and maintain these reheat units in a "clean" condition.

A-8-1 (A) The continued operation of an electronic computer system is dependent on information stored on cards, tape, discs, drums, etc. Therefore, the preplanning for continued operation should include:

(a) A program to protect records in accordance with their importance as set forth by Chapter 6.

(b) An analysis of the work load and the effect upon continuity of operations should be prepared for each computer facility.

(c) Arrangements for emergency use of other installed computer equipment to cover:

1. Plans for transportation of personnel, data and supplies to emergency computer locations.

2. Agreements and procedures for the emergency use of the computer equipment.

(d) Progams designed with adequate number of checkpoints and restarts to ensure rapid recovery to normal operations.

(B) Personnel should receive continuing instructions in:

(a) Method required for turning off all electrical power to the computer both under normal and emergency conditions.

(b) Turning off the air conditioning to the area.

(c) Alerting the fire department or company fire brigade.

(d) Evacuation of personnel.

(e) The location of and proper operation and application of all available fire extinguishing and damage control equipment including automatic detection and extinguishing equipment.

Computer room personnel should be fully trained in the use of extinguishers through actual operation on a practice fire.

(f) The importance of records and their storage requirements.

A-8-2 A written emergency fire plan should be prepared for and posted at each installation which assigns specific responsibilities to designated personnel. The following major items are suggested as minimum features of this plan.

(a) Remove all power to the computer system.

1. *Means.* Main line circuit breaker or equivalent for turning off all power.

2. *Location of Control for Disconnecting Means.* Remote controls for operating the disconnect located convenient to the operator and next to each exit door.

(b) Shut down air conditioning system.

1. *In Cases of Completely Separate Systems Only.* Emergency means similar to that described in A-8-2(a) provided to turn off the computer room air conditioning. They should also be located near the emergency power shut-off device.

2. *In Cases of Regular Building Systems Only.* Emergency means similar to that described in A-8-2(a) provided to close off all duct dampers leading to and from the computer room. They should be located near the emergency power shut-off device.

3. *In Cases of Combining the Regular Building System with a Supplementary System.* Emergency means provided to simultaneously accomplish the similar action as described in the preceding items (1) and (2).