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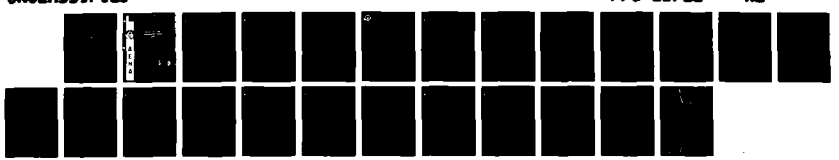

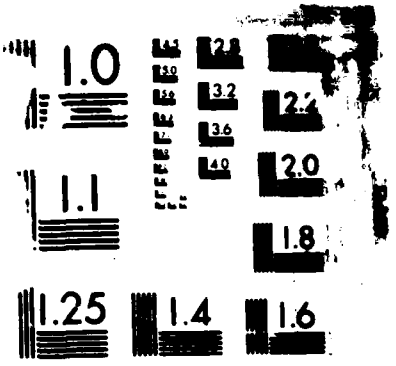
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UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

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SAFETY AND FIRE PREVENTION GUIDE

FOR HOSPITAL SAFETY MANAGERS

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This technical guide provides guidance to individuals responsible for safety and fire prevention in Army hospitals. It may also be a valuable tool to the experienced full-time safety person who has never worked in a hospital and to military personnel who have been assigned safety and fire prevention responsibility as a collateral duty. This guide is not meant to cover all of the day-to-day safety and fire prevention situations nor does it go into detail on each of the subjects it addresses. It does, however, provide factual information on a variety of subjects along with references so the interested person may obtain additional information.

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CONTENTS

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-MO-I

April 1987

USAEHA TECHNICAL GUIDE NO. 152

SAFETY AND FIRE PREVENTION GUIDE FOR HOSPITAL SAFETY MANAGERS

CHAPTER 1
INTRODUCTION

1-1. PURPOSE. This technical guide provides guidance to individuals responsible for safety and fire prevention in Army hospitals. It may also be a valuable tool to the experienced full-time safety person who has never worked in a hospital and to military personnel who have been assigned safety and fire prevention responsibility as a collateral duty. This guide is not meant to cover all of the day-to-day safety and fire prevention situations nor does it go into detail on each of the subjects it addresses. It does, however, provide factual information on a variety of subjects along with references so the interested person may obtain additional information. This information may be supplemented by local requirement in locations outside of the continental United States.

1-2. REFERENCES. The references are listed in Appendix A.

1-3. ABBREVIATIONS. Abbreviations used in this guide are explained in Appendix B.

1-4. SUGGESTED IMPROVEMENTS. The proponent of this guide is the US Army Environmental Hygiene Agency (USAEHA). Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-MO-I, Aberdeen Proving Ground, MD 21010-5422.

1-5. TECHNICAL ASSISTANCE. Requests for additional assistance and guidance should be addressed to the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-MO-I, Aberdeen Proving Ground, MD 21010-5422 (AUTOVON 584-3040).

CHAPTER 2
SAFETY MANAGEMENT

2-1. SAFETY POLICY STATEMENT. Each U.S. Army Medical Center (MEDCEN), U.S. Army Medical Department Activity (MEDDAC), and U.S. Army Dental Activity (DENTAC) commander should publish a safety policy statement immediately after assuming command. The statement should reflect his or her personal views on accident prevention; when applicable, touch on recent safety policy correspondence from the installation commander or higher headquarters; and request the support of all officers, soldiers and civilian employees. The statement should also direct department heads to review their safety standing operating procedure (SOP) and submit a current copy to the safety manager. The safety policy statement should be updated at least every 2 years. (HSC Suppl 1 to AR 385-10, para 2-2m; JCAH Std PL.3.1.1)

2-2. SMOKING POLICY. The hospital must have a written smoking policy. The hospital commander may prohibit smoking in the hospital. Smoking must be controlled to protect nonsmokers from the health hazards of secondhand smoke. If smoking is permitted, the policy must clearly state the designated smoking areas and that smoking is prohibited in all other areas of the hospital. The smoking policy must be appropriately disseminated and enforced. A highly visible sign stating the smoking policy must be posted at all hospital entrances. (Message 2179, HQDA, DAPE-ZA, 062350Z June 1986, subject: Policy on Controlling Smoking; Message 4235, HQDA, DAPE-HH, 272019Z June 1986, subject: Policy on Controlling Smoking; Message 2894, CINCUSAREUR, AEAGA-HF, 301705Z June 1986, subject: USAREUR Implementation of the Policy on Controlling Smoking; NFPA 101, Sec 31-4.4; JCAH Std PL.19.12)

2-3. SAFETY ORIENTATIONS.

a. All newly assigned civilian and military personnel should attend a safety orientation within 5 workdays of reporting to work. The orientation should include a discussion of fire reporting and evacuation procedures, use of portable fire extinguishers, the smoking policy, accident reporting, prevention of slips and falls, reporting safety hazards, the procedure for cleaning up spilled liquids, the mandatory use of vehicle restraining devices, and seasonal safety programs when applicable. This orientation may be a part of the overall hospital orientation, but it should not be part of the First Sergeants' briefing.

b. When a soldier or civilian employee reports to their work area, the supervisor should give the employee an indepth safety and fire prevention orientation relative to their work assignment. (NFPA 101, Sec 31-4.1.1, 31-4.1.4 and 31-4.2.3; JCAH Std PL.3.1.4)

CHAPTER 3
GENERAL SAFETY

3-1. MEDICAL GAS PIPING SYSTEMS.

a. Medical gas piping systems must be readily identifiable and appropriately labeled with the name of the gas. Piping must be labeled at intervals not to exceed 20 feet. Labeling will be by means of stenciling, metal tags, stamping or adhesive markers, and in a manner that is not readily removable.

b. Medical gas shutoff valves will be provided outside of patient rooms *and* inside or outside each anesthetizing location (see reference for exception). These shutoff valves must be clearly labeled to indicate the rooms or areas they control. The labeling on shutoff valves in older facilities is often not legible and relabeling may be required to ensure compliance. (NFPA 56F, Sec 4-1.8, 4-2.1, 4-2.4 and 4-2.6; JCAH Std PL.17.4)

3-2. MEDICAL AIR COMPRESSORS. Medical air compressors must be oil free units. They must be installed so that the air source comes from the outside atmosphere. The compressor's intake must be located outdoors above roof level and at a minimum distance of 20 feet above the ground. Intakes must be turned down and screened. See reference for exceptions. (NFPA 56F, Sec 2-2.7.1, 2-2.7.2 and 2-2.7.3; TM 5-838-2, para 9-10)

3-3. MACHINE GUARDING. All power machinery and equipment with exposed rotating parts must be adequately guarded against accidental injury. Unguarded fan blades and unguarded machinery belt drives are commonly found in the workplace. A good example is an air compressor with a guard installed on only one side of the belt drive. All fan blades and machinery belt drives installed within 7 feet of the floor must be fully enclosed with a guard. If wire mesh is used, spaces must be no larger than one-half inch. [29 CFR 1910.212(a)(5), 1910.213(a)(9) and 1910.219(e)(1)(i)]

3-4. COMPRESSED GAS CYLINDERS.

a. Compressed gas cylinders must be secured against falling at all times. Chains or a specially constructed rack are the preferred methods of securing cylinders.

b. Flammable gas cylinders must be separated from nonflammable gas cylinders and from oxidizing materials such as oxygen and nitrous oxide. Full and empty cylinders must be separated. Empty oxygen cylinders must be marked "empty or MT" to avoid confusion in the event a full cylinder is needed in a hurry.

c. Cylinder valve protection caps, when provided, must be kept in place.

d. Cylinders must also be stored out of direct sunlight.

e. Appropriate signs (e.g., no smoking, secure all freestanding cylinders, flammable) should be posted in use and storage areas.

f. Cylinder carts should always be used to transport compressed gas cylinders. Cylinders should never be carried, dragged or otherwise manhandled (small oxygen cylinders excepted).

g. A DD Form 1191 (Warning Tag for Medical Oxygen Equipment) will be attached to oxygen cylinders upon receipt from the vendor at the medical supply receiving dock. (NFPA 99, Sec 3-2.7.5 and 3-2.7.6; AR 700-68; TB MED 245)

3-5. COMPRESSED AIR. Compressed air is used for cleaning in dental laboratories, brace shops, and occasionally medical maintenance shops. Compressed air used for cleaning will be limited to less than 30 psi and then used only with effective chip guarding and personal protective equipment. Adequate air guns for chip guarding are usually provided. [29 CFR 1910.242(b)]

3-6. PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT.

a. Protective clothing and equipment will be used in Army hospitals and dental clinics.

b. When mixing photographic chemicals personnel will wear chemical resistant goggles or a full face shield, a rubber apron, and chemical resistant (rubber) gloves.

c. In the cast room, personnel operating portable saws to remove casts will wear hearing protection and protective eyewear.

d. Patients and staff operating machinery in Occupational Therapy Clinics will wear protective eyewear and hearing protection, when required.

e. Maintenance personnel (and visitors) will wear hearing protection while testing the emergency generator(s).

f. Personnel operating an incinerator will wear surgical head cover, surgical face mask, goggles, surgical gown, shoe covers, and gloves.

g. Laundry personnel will change from street clothes into separate work clothes and wear gloves when sorting soiled laundry. [29 CFR 1910.132(a); AR 40-5, paras 5-21 and 5-22; TB MED 6, para 3c]

3-7. GRAB BARS. Grab bars will be provided in all patient toilet and bathing areas (showers and bathtubs). Some facilities have installed grab bars that look fine but are not functional. A person sitting on a toilet or in a bathtub should be able to reach a grab bar without raising up out of the sitting position. The safety manager should double check for properly installed grab bars during remodeling and new construction projects before patient occupancy. (JCAH Std PL.19.2)

3-8. NURSE CALL SYSTEM. A reliable nurse call mechanism must be installed in locations where patients may be left unattended. As a general rule, each patient bed, toilet, shower, and bathtub will have a nurse call device that functions 24 hours a day. Nurse call systems must be tested periodically to ensure that they are in good working order. (JCAH Std PL.8.4)

3-9. HANDRAILS. Handrails (and/or stair railings) are required to be installed on all stairways of four or more risers (steps), whether indoors or outdoors. Lack of handrails is a safety hazard that exists mainly outdoors at medical treatment facilities and outlying buildings. [29 CFR 1910.23(d)(1)]

3-10. WALK-IN REFRIGERATORS. Walk-in refrigerators and freezers must have doors that open from the inside even if the door is locked from the outside with a key or a padlock. (JCAH Std DT.4.4.1; NSF Std 7, Sec 5.3)

3-11. AUDIOMETRIC TESTING BOOTH. There should be no means of locking a person inside of an audiometric testing booth. Any door latch should be a two way latch (without lock) to permit egress from the booth at all times. [TB MED 501, para 9d(2)]

3-12. ELECTRICAL BEDS. All electric beds used in the hospital must stop when the start button is released permitting control over the bed's movement. Walk-away type electric beds should not be permitted in the facility. The walk-away type moves the bed up or down or adjusts the mattress by pressing and releasing the start button but the movement continues until the stop button is pressed and released. (JCAH Std PL.19.1)

3-13. SNOW AND ICE REMOVAL. Building exits and adjoining walkways must be kept clear of all obstructions to include accumulations of snow and ice. Furthermore, when accumulation of snow or ice is likely because of the climate, any exterior exit access (e.g., door entering a stairway from outdoors) must be protected by a roof. [29 CFR 1910.37(g)(3); NFPA 101, Sec 5-1.7.3 and 5-5.3.8]

CHAPTER 4
ELECTRICAL SAFETY

4-1. LIAISON. The safety manager should maintain close liaison with the Chief, Medical Maintenance Branch. The Chief, Medical Maintenance Branch is the electrical safety expert in the hospital. He/she will advise the safety manager regarding electrical safety hazards and provide guidance as to which electrical hazards can be corrected inhouse and which must be submitted on a work order request to the Director of Engineering and Housing (DEH). The Chief, Medical Maintenance is responsible for testing, maintenance and repair of biomedical equipment for the MEDDAC/MEDCEN and DENTAC. He/she may undertake some additional electrical safety tasks depending on priorities, workload and staffing.

4-2. LEAKAGE TESTS ON EQUIPMENT. Medical Maintenance Branch personnel perform current leakage tests on all patient care electrical and electronic equipment. Records are required to be maintained. The commander must designate in writing whether the different patient care areas are critical care, general care, or wet areas. These replace the electrically susceptible patient locations (ESPL) and determine the electrical requirements in these areas, such as the number of electrical receptacles, identification of emergency receptacles, and testing of electrical patient-care equipment. The Surgeon General has prescribed that the following are critical areas for Army hospitals: Operating rooms, delivery rooms, cystoscopic rooms, oral surgery, recovery, coronary care units (patient bedroom), intensive care units (patient bedroom), emergency care units (treatment room), intravenous pyelogram (IVP), infant nursery, neonatal ICU, cardiac catheterization, trauma rooms, and hemodialysis.

4-3. EMERGENCY SYSTEM ELECTRICAL RECEPTACLES. Emergency system electrical receptacles require some form of identification such as a colored faceplate or "Emergency" stenciled on the faceplate. In critical care areas, the receptacles must also be marked to indicate which panelboard and circuit number supply them. [NFPA 70, Sec 517-84(a)]

4-4. TAMPERPROOF ELECTRICAL RECEPTACLES. Tamperproof electrical receptacles are required to be installed throughout patient areas of pediatric wards and clinics, and psychiatric wards. Tamperproof receptacles are designed to prevent an electrical shock from metallic objects which might be inserted into the receptacle slots. [NFPA 70, Sec 517-90(b)]

4-5. GROUND-FAULT CIRCUIT INTERRUPTER. Ground-fault circuit interrupter (GFCI) protection is required for each circuit supplying receptacles in hydrotherapy rooms. GFCIs are usually installed in the receptacle, however, some contractors place them in the circuit breaker panel. In the event of current leakage, a GFCI will shut off the power to the hydrotherapy unit instantaneously before a person could receive a fatal shock. [NFPA 70, Sec 680-62(a)]

4-6. REQUIRED ELECTRICAL RECEPTACLES. For each patient bed location in *general care areas*, a minimum of four single or two duplex electrical receptacles is required. For *critical care areas*, six single or three duplex receptacles are required for each patient bed. (NFPA 70, Sec 517-83 and 517-84)

4-7. USE OF PERSONAL ELECTRICAL EQUIPMENT. A written policy for the control of personal electrical equipment not supplied by the hospital is required. This policy should identify the specific type(s) of equipment that may be brought into the hospital by patients and staff without being inspected by the medical maintenance staff or Safety Manager [e.g., electric or battery operated tooth brush, small battery operated radio (DC only)]. The policy should state what equipment is prohibited (e.g., heaters) and the procedure for having equipment inspected prior to use in the hospital. The nursing staff will have most of the enforcement responsibility. (NFPA 99, Sec 9-4.7; JCAH Std PL.10.4)

4-8. GENERATORS AS ALTERNATE SOURCE OF POWER. At least one generator set, located on the grounds of the hospital, will be used as the alternate source of power for the hospital. The generator(s) will be inspected weekly and exercised under actual load and operating temperature conditions for at least 30 minutes each month. A remote annunciator, storage battery powered, is required to be located outside of the generating room in a location staffed 24 hours a day. The generator must start and be on line within 10 seconds of a power failure. (NFPA 99, Sec 8-2.1.1.2, 8-2.3.6, 8-2.4.1.1, 8-2.4.2.1; NFPA 70, Sec 517-61 and 700-12)

4-9. RULES AND REGULATIONS FOR ANESTHETIZING LOCATIONS. Rules and regulations for safe practice in nonflammable anesthetizing locations are required to be posted in the operating room (OR) suite. Management and the professional staff should consider and agree on necessary rules and regulations for control of personnel concerned with anesthetizing locations. On adoption, the rules and regulations will be prominently posted in the OR suite. Suggested text for rules and regulations is provided in Appendix C, C-3.3, Set (2), NFPA 99. (NFPA 99, Sec 3-2.7.3.1)

4-10. MARKING POWER DISCONNECTORS. All power disconnecting means (circuit breakers, fuses, master switches, etc.) must be legibly marked to indicate their specific purpose unless located and arranged so that the purpose is evident. Update circuit breaker panel directories to reflect current use. (NFPA 70, Sec 110-22)

4-11. ACCESS TO KEYS. Keys to electrical closets and circuit breaker panels must be available to nursing personnel on each ward for use in emergencies. An acceptable practice is to put the keys at the nursing station or on the key ring of the head nurse on each shift. [NFPA 70, Sec 240-24(b); 29 CFR 1910.304(e)]

4-12. EXTENSION CORD POLICY. An established policy on using extension cords and adaptors is needed. Extension cords may not be used as a substitute for fixed wiring of a structure or run through holes in walls, ceilings, floors, doorways, or windows. Extension cords should be used only in emergency situations. If used, they must be 16 gauge or heavier and be equipped with grounding-type attachment plugs and outlets. [29 CFR 1910.305(g)(1)(iii); NFPA 70, Sec 400-8; JCAH Std PL.19.7]

CHAPTER 5
FIRE PREVENTION AND FIRE PROTECTION

5-1. LIAISON WITH LOGISTICS DIVISION. The safety manager should maintain close liaison with the Logistics Division. There should be a procedure whereby the safety manager reviews all purchase or service requests and contracts that involve fire prevention (e.g., cubicle curtains, draperies, floor or ceiling cover, cleaning of hoods and ducts, installation of sprinkler systems, etc.). The hospital safety committee must support this procedure.

5-2. FIRE DRILLS. Fire exit drills will be held at least quarterly, on all three shifts, in each patient occupied building. Drills should not be conducted at shift changes. It is not necessary to evacuate patients or even awaken sleeping patients. Written fire drill reports are required. When drills are conducted during normal duty hours, management should ensure that all personnel (except those persons who are actually in the process of treating patients) actively participate. Installation fire department participation is important, but not necessary for each drill. Employees should be given the opportunity to "break the glass" and turn in the alarm. The safety manager should visit all wards on all shifts at least annually to discuss fire drills and to review with the employees the hospital fire prevention program. (NFPA 101, Sec 31-4.1.3; JCAH Std PL.5.8.1.1)

5-3. EXIT MARKING. Exit marking is very important in the hospital environment; however, it is usually not a problem unless construction or remodeling projects are underway. Remember this, if you stand in any corridor you should be able to see an exit sign in each direction. An exit directional sign (EXIT with arrow pointing direction) is required in every location where the direction of exit travel to reach the nearest exit is not immediately apparent. (NFPA 101, Sec 5-10.1.2, 5-10.4.1.1)

5-4. FIRE PREVENTION SIGNS. Fire prevention signs should be highly visible and easy to read. Fire alarm box instructions, kitchen hood extinguishing system instructions, No Smoking, Exit and other applicable messages should be bilingual, when appropriate.

5-5. FIRE DEPARTMENT VISITS. The installation fire department should be a frequent visitor to the hospital. Aside from their routine services such as checking fire extinguishing systems, many fire departments will conduct pre-fire planning surveys of the hospital. They plan hose lays and other procedures that would take place in the event of a fire in a specific location.

5-6. PROTECTING HAZARDOUS AREAS. In existing hospitals, any hazardous area must be protected by 1-hour fire-resistive construction (fire-resistive construction is defined as building materials or assemblies that have withstood a fire exposure for a designated period of time measured in hours or minutes) or an automatic fire extinguishing system (sprinklers). This includes trash collection and soiled linen rooms, occupational therapy

clinics, boiler rooms, repair and maintenance shops, and storage/supply rooms. Some of the laboratories in Army facilities are considered a severe fire hazard (depending on the fire load) and require both 1-hour fire-resistive construction and a sprinkler system. All sprinkler system flow alarms must be connected to the fire alarm system. Storage space in Army hospitals is at a premium and storage rooms are sometimes stocked to the ceiling. This interferes with the proper sprinkler operation. There must be 18 inches of vertical clearance between sprinkler deflectors and the top of storage. [NFPA 101, Sec 13-3.2.1 and 13-3.5.2; NFPA 99, Sec 7-3.4.1; NFPA 13, Sec 4-2.5.1; 29 CFR 1910.159(c)(10); JCAH Std PL.7.6.1]

5-7. FIRE AND SMOKE DOORS.

a. Fire doors, ordinary room doors (such as doors to a patients room), and smoke barrier doors must be side hinged and of the swinging type (there are some approved sliding/folding type doors available).

b. A rated door or fire door includes the doorway, frame, door, and hardware which is known as the door assembly. Fire doors and frames must be labeled with the door and frame rating. The label for the door is usually on the inside edge of the door (it may be on the top edge of the door). The label on the frame is usually located just below the top hinge.

c. Fire doors are found in stairway enclosures and enclosures to hazardous areas. They must be self-closing and equipped with a positive latching device. On all stairway doors there must be a sign which reads "FIRE EXIT Keep Door Closed." The sign must be placed on the side of the door from which egress is made.

d. Ordinary room doors must be 1-3/4 inch solid bonded core wood or rated to resist fire for at least 20 minutes. Ordinary room doors are not required to have a label and they are not required to be self-closing.

e. Smoke barrier doors must be rated at 20-minutes or be a 1-3/4 inch solid bonded wood core door. Smoke barrier doors do not require a label, but they must be self-closing. The meeting edges of smoke barrier doors must not be over 1/8 inch apart and without an undercut (maximum of 3/4 inch is permitted). (NFPA 101, Sec 5-2.1.1.1, 5-10.4.2.2, 13-3.6.3, 13-3.7.6)

5-8. VISION PANELS. Vision panels (windows) in corridor walls and doors must be fixed wired glass in steel or approved metal frames and limited in size to 1296 square inches. Vision panels in fire doors must be fixed wired glass in steel or approved metal frames and limited in size to 100 square inches. (NFPA 101, Sec 13-3.6.2, 13-3.6.3; NFPA 80, Sec 1-7.3)

5-9. LOUVERS, TRANSOMS, AND TRANSFER GRILLS. Louvers, transoms and transfer grills are not permitted in walls or doors in the hospital with one exception. Transfer grills may be used in doors to toilet rooms, bathrooms, shower rooms, and janitor (sink) closets.
(NFPA 101, Sec 13-3.6.5)

5-10. DUTCH DOORS. Dutch doors may be used when they meet the requirements of a 20-minute door or 1-3/4 inch solid bonded wood core door if--

a. both the upper leaf and lower leaf are equipped with a latching device, and

b. the meeting edges of the upper and lower leaves are equipped with an astragal, rabbet or bevel to prevent the passage of smoke through the door (a smoke barrier between the two halves of the door similar to weather stripping). (NFPA 101, Sec 13-3.6.4)

5-11. POWER-OPERATED DOORS. Power-operated doors are used at emergency room entrances, in operating rooms, and sometimes at other entrances of the hospital. These doors are usually on emergency power and they are permitted if they have what is called a "breakaway feature." In the event of a power failure, the doors must be designed to be opened manually to permit exit travel or closed where necessary to safeguard the means of egress. If a power-operated door is used as a required exit, it must also swing with the exit travel by manual means. (NFPA 101, Sec 5-2.1.9.1 and 5-2.1.9.2)

5-12. DOORS NORMALLY KEPT CLOSED. A door designed to be normally kept closed (such as a stairway door or a smoke door, or a door to a required enclosure of a hazardous area), must be a self-closing door and must not be secured in the open position at any time. A door may be held open with an electromagnetic device that is connected to the fire alarm system. Note: Personnel are known to prop doors open with anything handy and will disconnect or remove the door closer. (NFPA 101, Sec 5-2.1.8 and 13-2.11.5)

5-13. STAIRWAYS. Stairways are to be used for their intended purpose only. They are not to be used for storage, vending machines, or waiting areas. (NFPA 101, Sec 5-1.3.2 and 5-2.2.3.4)

5-14. PENETRATIONS IN WALLS AND FLOORS. The penetration of pipes, conduits, cables, wires, air ducts, pneumatic ducts, and similar building service equipment through floors, smoke barriers, and fire barriers are often not completely sealed to prevent the passage of smoke or flame. All penetrations and openings in floors, smoke barriers, and fire barriers must be sealed with a material capable of maintaining the smoke resistance or fire resistance of the floor or barrier. The safety manager should make periodic spot checks above acoustical tile ceilings for penetrations in corridor walls and especially above openings for corridor doors. This is an important item to check after a renovation project and before acceptance of new construction. (NFPA 101, Sec 6-2.2.8, 6-3.5.1 and 6-3.5.2)

5-15. FIRE ALARM PULL STATIONS. A manual fire alarm pull station will be provided in the natural path of escape near each required exit from an area. Each manual fire alarm station must be accessible, unobstructed, visible, and of the same general type. The fire alarm system will be of the type that automatically transmits an alarm to the installation fire

department. There is a requirement for a preventive maintenance program and quarterly inspection of all fire alarm systems. The inspection and testing of fire alarm systems must be documented. When time and conditions permit during fire exit drills, personnel should be encouraged to actually activate the fire alarm pull box. (NFPA 101, Sec 7-6.2.3 and 7-6.2.5; JCAH Std PL.7.5 and 15.7.5.1)

5-16. WAITING AREAS. In older Army hospitals, waiting areas are sometimes crowded and this leads to patients and visitors sitting in corridors (means of egress). Waiting areas--

a. may be open to the corridor provided each area does not exceed 600 square feet,

b. must be located to permit direct staff supervision,

c. must be equipped with automatic smoke detectors connected to the fire alarm system, and

d. must be arranged not to obstruct any access to required exits. [NFPA 101, Sec 13-3.6.1 (Exception 3)]

5-17. INCINERATOR ROOMS. Incinerator rooms located in a hospital must have approved self-closing or automatic-closing 1 1/2-hour, B-labeled fire doors. An automatic fire extinguishing system (sprinklers) must be installed in all incinerator rooms. Furthermore, each incinerator room will have a water source (faucet), a hose that can be attached to the faucet, and a floor drain. A vacuum breaker should be installed on the faucet to prevent a cross connection. (NFPA 82, Sec 2-3.6.2 and 2-3.6.3)

5-18. PORTABLE FIRE EXTINGUISHERS. Portable fire extinguishers are placed throughout the hospital at locations determined by the installation fire department. Fire department personnel select extinguishers based on the classification of the hazard *and* the classification and rating of the extinguisher. Additional extinguishers can be obtained from the fire department when the need can be justified. Fire extinguishers should be inspected monthly and a written record maintained. They should be installed on hangers or on brackets *or* placed on shelves or in cabinets. Fire extinguisher locations should be well marked, clearly visible, and free of any obstructions that might prevent easy access in the event of a fire. Hospital personnel should be provided annual fire prevention training to include handling and discharging a fire extinguisher. (NFPA 10, Sec 1-6.3, 1-6.6, and 1-6.9; 29 CFR 1910.157 and Appendix A to Subpart L)

5-19. PROTECTING MEDICAL AND DENTAL RECORDS. Medical and dental records must be protected against fire and water damage. This includes records at troop medical clinics and outlying dental clinics. When records are stored on open shelving, an automatic fire sprinkler system must be installed throughout the records room. On-off type sprinklers should be installed. A practical alternative for improving the security of records is to store records in enclosed metal cabinets. (NFPA 232, Sec 3-13.2; JCAH Std MR.3.2.1)

5-20. KITCHEN EXHAUST HOODS. Kitchen exhaust hoods must be equipped with approved fire extinguishing equipment. The equipment must protect the duct systems, grease removal devices, and hoods. The system must also be designed to protect the cooking surfaces of stoves or grills. The system is required to have a manual release installed at a safe distance from the hoods in a path of exit or egress. This release (usually in the form of a pull box) must be clearly marked with easy to read posted instructions on how to activate the system. (NFPA 96, Sec 7-1.1, 7-1.2 and 7-3.1.1; JCAH Std PL.7.8)

CHAPTER 6
LABORATORY SAFETY

6-1. LABORATORY SAFETY OFFICER. A laboratory safety officer will be appointed on orders. He/she should work in the laboratory, however, the individual could be the hospital safety manager. The laboratory safety officer is responsible for writing the laboratory safety SOP which includes the fire evacuation plan, procedures for controlling chemical spills, and procedures for extinguishing clothing fires. The laboratory safety officer's other duties include--

a. orienting newly assigned civilian employees and military personnel

b. conducting safety inspections

c. ensuring that the emergency shower(s) and eye lavage(s) are flushed on a regular schedule and that the flushing is documented

d. enforcing the use of personal protective equipment

e. ensuring that personnel receive training in the use of the self-contained breathing apparatus (when provided)

f. ensuring that compressed gas cylinders, flammable liquids and acids are properly stored.

[29 CFR 1910.134(e); NFPA 99, Sec 7-2.2.3.2, 7-2.2.3.3, 7-3.4 and 7-6.1.2; ANSI Z358.1, para 4.7.1 and 5.5.1] (Additional requirements have been proposed in 29 CFR 1910.1450 and may impact on the safety officer's responsibilities.)

6-2. FIRE REPORTING PROCEDURES. Fire reporting procedures for the laboratory should parallel the plan for the hospital with some additional considerations. Special attention should be given to emergencies that may occur after normal duty hours. Furthermore, in the event of a fire, the fire department needs to know what type of fire has occurred (e.g., ordinary combustibles, electrical, flammable liquids, compressed gas cylinder, natural gas line), its location within the laboratory, and whether chemicals are stored in the fire area. The laboratory should conduct periodic practice fire and chemical spill drills. The drills should be documented. (NFPA 99, Sec 7-2.2.3.1)

6-3. SELF-CONTAINED BREATHING APPARATUS. All laboratory personnel will be trained in the care and use of self-contained breathing apparatus if provided in the laboratory. There will be written procedures prepared on the safe use of the apparatus. The apparatus must be inspected monthly. Installation fire department personnel should provide the necessary training. [29 CFR 1910.134(e)(5); NFPA 99, Sec 7-3.4]

6-4. PROHIBITING EATING, DRINKING, AND SMOKING. Eating, drinking, and smoking is prohibited in the laboratory. A lounge or break room should be provided for coffee breaks and lunch. The break room may be designated a smoking area if permitted by the hospital smoking policy. [29 CFR 1910.141(g)(2)(4); College of American Pathologists Guidelines for Lab Safety, Chapter II]

6-5. LABELING REFRIGERATORS. Every laboratory refrigerator must be clearly labeled to indicate whether it is safe for storing flammable liquids. A good safety practice is to label all refrigerators to prohibit the storage of food. (NFPA 99, Sec 7-4.2.5)

6-6. MOUTH PIPETTING. Mouth pipetting is prohibited in hospital laboratories. (College of American Pathologists Guidelines for Lab Safety, Chapter IX)

6-7. STORING FLAMMABLE LIQUIDS AND ACIDS.

a. NFPA 99 limits the amount of flammable liquids stored outside an approved flammable liquids cabinet to not more than 10 gallons. The total capacity of approved flammable liquid storage cabinets in a laboratory will not exceed 60 gallons. Flammable liquids will not be stored in any exit corridor or passageway leading to an exit. (NFPA 99, Sec 7-4.2.2)

b. Laboratories using/storing acids should have an acid storage cabinet specifically designed for storing acids. Otherwise, acids must be stored in a sand box on the floor of a cabinet. The acid storage cabinet should be clearly labeled to indicate its contents. A deluge shower and fixed eye lavage must be located in the immediate vicinity of the acid storage cabinet. [29 CFR 1910.151(c); NFPA 99, Sec 7-3.5]

6-8. WATER FOR EMERGENCY USE.

a. Where the eyes or body of a person may be exposed to injurious corrosive materials, a deluge shower and fixed eye lavage will be provided to supply copious quantities of water for emergency use.

b. Deluge shower(s) and fixed eye lavage(s) must be installed in the laboratory. There will be an OS and Y (outside stem and yoke) valve installed in the branch line to the deluge shower to service the unit. This valve will be sealed in the open position. The number of units and locations will depend on the hazards involved.

c. Deluge showers and fixed eye lavages must be flushed weekly to ensure proper operation. Additionally, fixed eye lavages must be flushed once a month for 3 minutes to minimize the opportunities for the build-up of bacterial, viral, or protozoal organisms. A written record of these procedures will be maintained. Portable eye wash units are not permitted when a potable plumbed water source is available.

d. Access to the deluge shower(s) and eye lavage(s) must be kept clear at all times and highly visible signs must be posted to indicate the locations of this equipment. [29 CFR 1910.151(c); HSC Suppl 1 to AR 385-10, para 5-2a(4); NFPA 99, Sec 7-3.5; ANSI Z358.1, para 4.7.1 and 5.5.1]

APPENDIX A

REFERENCES

1. AR 40-5, Preventive Medicine.

2. AR 700-68, Storage and Handling of Compressed Gases and Compressed Gas Cylinders.

3. HSC Supplment 1 to AR 385-10, The Army Safety Program.

4. TB MED 6, Occupational Safety and Health in Dental Clinics (to be republished as TB MED 511).

5. TB MED 245, Warning Tag for Medical Oxygen Equipment (DD Form 1191).

6. TB MED 501, Hearing Conservation.

7. TM 5-838-2, Army Health Facility Design.

8. Accreditation Manual for Hospitals, JCAH, 1987 Edition, Chicago, Illinois.

9. Title 29, CFR, Part 1910, Occupational Safety and Health Standards.

10. National Fire Codes, National Fire Protection Association (NFPA), Qunicy, Massachusetts.

a. NFPA 10, Portable Fire Extinguishers.

b. NFPA 13, Installation of Sprinkler Systems.

c. NFPA 56F, Nonflammable Medical Gas Systems.

d. NFPA 70, National Electrical Code.

e. NFPA 80, Fire Doors and Windows.

f. NFPA 82, Incinerators, Waste and Linen Handling Systems and Equipment.

g. NFPA 96, Cooking Equipment, Vapor Removal.

h. NFPA 99, Health Care Facilities.

i. NFPA 101, The Life Safety Code.

j. NFPA 232, Protection of Records.

11. American National Standards Institute Standard Z358.1, Emergency Eyewash and Shower Equipment.

12. Letter, HQ, HSC, HSCL-C, 9 July 1986, subject: Storage and Administration of Oxygen for Medical Use.

13. Message 2179, HQDA, DAPE-ZA, 062350Z June 1986, subject: Policy on Controlling Smoking.

14. Message 4235, HQDA, DAPE-HH, 272019Z June 1986, subject: Policy on Controlling Smoking.

15. Message 2894, CINCUSAREUR, AEAGA-HF, 301705Z June 1986, subject: USAREUR Implementation of the Policy on Controlling Smoking.

16. Guidelines for Laboratory Safety, College of American Pathologists, Skokie, Illinois, 1985.

17. National Sanitation Foundation Standard, Number 7, Food Service Refrigerators and Storage Freezers.

APPENDIX B

ABBREVIATIONS

ANSI	American National Standards Institute
DEH	Director of Engineering and Housing
DENTAC	U.S. Army Dental Activity
ESPL	electrically susceptible patient locations
GFCI	ground-fault circuit interrupter
IVP	intravenous pyelogram
JCAH	Joint Commission on Accreditation of Hospitals
MEDCEN	U.S. Army Medical Center
MEDDAC	U.S. Army Medical Department Activity
NFPA	National Fire Protection Association
OR	operating room
OS&Y	outside stem and yoke
OSHA	Occupational Safety and Health Administration
SOP	standing operating procedure
Std	Standard

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