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Safety

DATA PROCESSING FACILITIES

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(SMSgt Pennie Hardesty)
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The criteria in this standard are the Air Force's minimum safety, occupational health, and fire prevention requirements. Major commands (MAJCOM), direct reporting units (DRU), and field operating agencies (FOA) may supplement this standard when additional or more stringent safety and health criteria are required. Refer to Air Force Instructions (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Programs*, for instructions on processing supplements or variances. Report conflicts in guidance between this standard, federal standards, or other Air Force directives through MAJCOM, DRU, or FOA ground safety offices to Headquarters Air Force Safety Center, Ground Safety Division, Safety Engineering and Standards Branch (HQ AFSC/SEG), 9700 Avenue G, SE Kirtland AFB, NM 87117-5670.

This standard applies to all US Data Processing Facilities, including all US Air Force Reserve personnel and when Air National Guard personnel are on federal service. It addresses the maintenance and house-keeping of data processing installations (DPI), excluding Embedded Computer System (ECS) support complexes. Remote terminals or keypunch facilities do not constitute a data processing installation. .

NOTE: AFOSH 127-series standards are being converted to 91-series standards and the 161-series standards will become 48-series standards. However, not all standards have been converted as of the effective date of this standard. To help you locate these documents, references to AFOSH standards are stated in the updated series and standard number, with the outgoing series and standard number stated as "formerly designated as" in the 'references' section of **Attachment 1**.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

Administrative changes have been made to update this standard to electronic format. Paragraphs have been renumbered and references updated. Minor change made to delete reference to key punch machines. A glossary of references, abbreviations, acronyms, and terms is provided at **Attachment 1**. Changes are annotated by a vertical bar (/).

1. Hazards and (or) Human Factors:

1.1. Good housekeeping is an important element of mishap prevention in computer facilities. Poor housekeeping may lead to fires, injuries to personnel, or unhealthful working conditions. Mishaps caused by dropping heavy cartons and other related computer room equipment and supplies could also be a source of serious injuries to personnel. Adequate normal and emergency lighting plays a large part in ensuring that hazardous conditions can be seen and avoided.

1.2. Mishaps caused by improper fire prevention practices could be a major source of injury and equipment damage. Damages and injuries result from the improper use of fire extinguishers, including using the wrong type of extinguisher agent. For example, water or foam on electrical fires may cause equipment damage or pose a shock hazard to people using the extinguisher. Carbon dioxide (CO₂) used on a cathode-ray tube (CRT) remote terminal could cause the tube to implode and injure personnel from the debris. Flammable cleaning fluids may release toxic gases when they burn and pose a greater hazard than nonflammable fluids. Ashes from cigars, cigarettes, and pipes could cause damage to equipment and data storage devices. Inadequately marked egress routes could inhibit or prohibit escape in the event of a fire.

1.3. Accidental contact with energized electrical circuits could result in serious injury or electrocution if quick emergency action is not taken.

1.4. Excessive noise is distracting and reduces production and efficiency in activities where oral communication is important. More intense noise can cause physical damage to the human ear.

1.5. Damage to equipment could result if water lines above the computer room were to break, or if the sprinkler system was to activate, and some means of equipment protection were not available.

2. Requirements:

2.1. Proper layout, spacing, and arrangement of equipment and machinery are essential. Good layout of a data processing installation can best be achieved in the planning stages by considering current and future uses of the facility. The ground safety manager, fire chief, bioenvironmental engineer, and civil engineer will coordinate on all plans.

2.2. All aisleways within a computer room will be clearly defined and kept free of obstructions.

2.3. Suitable non-combustible containers will be used for scraps and wastes as they accumulate. These containers will be emptied when full and (or) at the end of each shift. If not emptied, they will be moved to a location outside the computer room.

2.4. Following are requirements for proper maintenance of floors:

Building floors, especially raised floors in computer rooms, will be kept smooth, clean, and free of obstructions and slippery materials.

- Floor loading capacities will be identified and posted according to AFOSH Standard 91-22, Walking Surfaces, Guarding Floor and Wall Openings and Holes, Fixed Industrial Stairs, and Portable and Fixed Ladders. Capacities will not be exceeded.
- Floors will not be cleaned with flammable liquids or abrasive scrubbing powders. When toxic cleaning agents are used, adequate ventilation will be provided to remove vapors. Carpeted floors will be vacuumed once each day, except where high efficiency filters are installed in the ventilation system.

- To prevent buildup of trash and foreign objects, sub-floors under raised floors in computer rooms will be cleaned periodically, but not less than once each 60 days. Sub-floors will not be used for storage. Openings in raised floors for electrical cables or other uses will be protected to prevent the collection of debris. Sub-floors should be checked once each operational day to assure there is no flooding or leaking.

2.5. Electric buffing machines will be equipped with a three-wire grounding cord and three-prong plug. Operating procedures should include inspection and maintenance procedures and any cautions that must be taken when operating buffing machines.

2.6. Tools will not be left on equipment or lying in aiseways. Suitable racks or cabinets will be provided for storage.

2.7. To prevent electromagnetic interference, electrically-operated vending machines will not be installed in computer rooms or rooms containing remote terminal units.

2.8. Oil, cleaning fluids, water, and other substances spilled on computer room floors will not only cause slipping hazards, but may also short-circuit equipment. When spills do occur, they will be cleaned up immediately with approved cleaning materials.

2.9. Coat racks will not be allowed in a computer room, since they contribute to undesirable traffic, dust, and lint conditions.

2.10. Because food or drinks can damage electrical components, eating or drinking will not be allowed within a computer room or while operating remote equipment or keypunches. Signs prohibiting food or drinks will be posted at each entrance to a computer room and at each remote terminal and keypunch location.

2.11. Materials stored within data processing facility supply rooms will be neatly stacked and readily reached by adequate aiseways. Cross ties, separators, or dunnage will be used to guard against falling objects and care will be taken to stack materials so they will not topple over. Under no circumstances will materials be stacked within 18 inches of ceiling fire sprinkler heads or Halon nozzles. Materials will not be stored so they project into aisles or passageways in a manner that could cause persons to trip or could hinder fire fighters.

2.12. Emergency control switches will be installed in all data processing rooms. These controls will be readily accessible to the operator and unobstructed at all times. They will be located at designated exit doors. These controls will disconnect the ventilation system serving the room and selective power to all electrical equipment in the room except lighting. Specific power shutdown procedures must be tailored to the individual facility. Further, these controls will be plainly marked as to their function and covered to prevent accidental shut-off.

2.13. Only fire fighting equipment approved by the installation fire chief for use within a data processing installation will be used. See AFOSH standards for guidance in extinguishing systems.

2.14. Tapes and disk packs will be stored in separate rooms or vaults. All tape stands and storage racks will be of sound construction and will not exceed 7 feet in height. Tapes and disk packs will not be stored in aisles, corners, or on top of equipment. The installation fire chief will be notified of the location of all tape and (or) disk pack libraries so fire fighting personnel are aware of the possibility of toxic fumes from the burning plastic.

2.15. All non-metal furniture and furnishings used within computer rooms will be made of fire-resistant materials. Only metal or other fire-resistant containers will be used for the storage of card decks, operating manuals, and frequently-used forms, paper, and other supplies. Production outputs from production runs will be removed from the data processing room immediately upon completion of the run, unless preliminary checking is required. If preliminary checking is required, adequate work space will be provided. Only non-combustible wastebaskets equipped with self-closing lids or tight-fitting covers will be used. These wastebaskets will be strategically located to reduce traffic in the data processing room; for example, at the entrance, by the console, printers, and card readers.

2.16. Smoking will not be permitted in a computer room. Signs prohibiting smoking will be posted at each entrance to the computer room and ash receptacles placed outside each entrance.

2.17. When possible, only nonflammable and nontoxic cleaning fluids will be used for cleaning data processing equipment. If flammable or toxic cleaning fluid must be used, no more than a 1-day supply will be kept within the computer facility. At no time will flammable or toxic cleaning fluids be stored in open containers. Only lint-free or treated cloths recommended for this type cleaning will be used with cleaning fluids.

2.18. Bioenvironmental engineers will be advised of routine maintenance procedures that involve the use of cleaning chemicals. The bioenvironmental engineer will determine the degree of hazard associated with the operation and prescribe appropriate controls.

3. Safety Equipment:

3.1. Battery-operated emergency lighting units will be installed as part of the building's fixed wiring system. These units will provide illumination in work areas, hallways, and exits. Units will be inspected annually and immediately repaired or replaced when found to be defective or inoperative.

3.2. Where voltages over 600 volts are present, each data processing facility will be provided with emergency equipment. The type of emergency equipment required will be determined by the functional manager in coordination with the base ground safety manager. The equipment will be situated in a conspicuous and prominent location at each site, well marked, and readily accessible to personnel. This does not preclude commanders from requiring safety boards at lower voltages. Suggested items include:

Ground stick (shorting stick).

- Resuscitation and closed chest heart massage instructions.
- Emergency phone numbers.
- First-aid kit at remote facilities.
- Hook with hardwood handle. The hook should not part from the handle with a 300-pound pull. Instead of this, a wooden cane may be used.
- Rope.
- Insulated fuse puller. (For DPIs not equipped with circuit breaker panels.)
- Flashlight, non-metallic case, in operating condition, marked with luminescent tape. (Cyalume high intensity light sticks may be an alternative.)

3.3. Illuminated exit signs will be provided for each exit and passageway. National Fire Protection Association (NFPA) 101, *Life Safety Code*, may be referenced for guidance.

3.4. To preclude water damage:

3.4.1. Computer rooms located below floors equipped with water sprinkler systems are susceptible to water damage if the sprinkler systems are actuated. Managers will provide means of protecting computer equipment in the event of a water leak or sprinkler activation. This may be accomplished by strategically locating pre-cut pieces of plastic sheeting within the computer room. In the event of a water spill, equipment will be shut down before it is covered with the plastic sheeting to prevent overheating and possible fire. (Plastic sheeting will be removed before restarting equipment.)

3.4.2. Each DPI should request a survey by the civil engineer to determine if a water hazard exists. The completed survey will be kept on file and will be used during initial safety orientation of incoming personnel.

4. Personnel Protection:

4.1. When sound levels are suspected to be abnormally high, base bioenvironmental engineers will be contacted and a sound level survey requested.

4.2. If the survey indicates that employees will be exposed to hazardous levels of noise, the functional manager will initiate required engineering and administrative controls, as determined by the bioenvironmental engineers according to AFOSH Standard 48-19, *Hazardous Noise Program*.

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Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Programs*.

Air Force Occupational Safety and Health (AFOSH) Standard 48-19, *Hazardous Noise Program*.

AFOSH Standard 91-22, *Walking Surfaces, Guarding Floor and Wall Openings and Holes, Fixed Industrial Stairs, and Portable and Fixed Ladders*.

National Fire Protection Association (NFPA) 101, *Life Safety Code*.

Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) Subpart D, *Walking - Working Surfaces, 1910.22, General Requirements*.

OSHA 29 CFR 1910.37, *Means of Egress, General*.

OSHA 29 CFR 1910.95, *Occupational Noise Exposure*.

OSHA 29 CFR 1910.106, *Flammable and Combustible Liquids*.

OSHA 29 CFR 1910.157, *Portable Fire Extinguishers*.

Abbreviations and Acronyms

AFI—Air Force Instruction

AFOSH—Air Force Occupational Safety and Health

AFSC—Air Force Safety Center

CO₂—Carbon Dioxide

CRT—Cathode-Ray Tube

DPI—Data Processing Installations

DRU—Direct Reporting Unit

ECS—Embedded Computer System

FOA—Field Operating Agency

HQ—Headquarters

MAJCOM—Major Command

NFPA—National Fire Protection Association

OSHA—Occupational Safety and Health Administration

PDO—Publishing Distribution Office

Terms

Battery-Operated Emergency Lighting Units—Any battery-operated lighting unit which

automatically switches on when a power failure occurs.

Cleaning Fluids—Any fluid used to clean tape heads, tapes, pens, or any equipment related to data processing.

Emergency Controls— Manual electrical switches controlling air conditioning, power to equipment, and lights in a computer room.

Grounding Stick—A device used to ground electronic circuits and bleed off voltage or static electricity.

Hook with Hardwood Handle or Cane—A non-conductive device used to pull an individual away from an energized circuit.

Insulated Fuse Puller—A non-conductive device used to remove fuses from circuit boxes.

May—Indicates an acceptable or satisfactory method of accomplishment.

Shall—Indicates a mandatory requirement.

Should—Indicates a preferred method of accomplishment.

Tape and (or) Disk Library—A room, vault, or cabinet used for the storage of magnetic tapes or disks.

Waterproof Protective Covering—Any waterproof material used to protect computer equipment from water damage.

Will—Is also used to indicate a mandatory requirement and to express a declaration of intent, probability, or determination.

Attachment 2

DATA PROCESSING FACILITIES CHECKLIST

This is not an all-inclusive checklist. It simply highlights some critical items in this chapter. Other requirements exist in the chapter that are not included in the checklist. Where appropriate, MAJCOMs, DRUs, FOAs, local ground safety offices, and supervisors will add to this checklist to include command or individual shop-unique requirements or situations.

A1.1. Are proper facility layout plans coordinated with the Ground Safety Manager, Fire Chief, Bioenvironmental Engineer and Civil Engineer? (Reference paragraph 2.1)

A1.2. Are aisleways within the computer room clearly defined and kept free of obstructions? (Reference paragraph 2.2)

A1.3. Are noncombustible containers used for scraps and wastes? (Reference paragraph 2.3)

4. Are noncombustible containers emptied when full or at the end of each shift? (Reference paragraph 2.3)

5. Are floors, especially raised floors in computer rooms, kept smooth, clean, and free of obstructions and slippery materials? (Reference paragraph 2.4)

6. Are floor loading capacities identified and posted? (Reference paragraph 2.4)

7. Do supervisors ensure floors are not cleaned with flammable liquids or abrasive scrubbing powders? (Reference paragraph 2.4)

8. If toxic cleaning agents are used, is adequate ventilation provided to remove vapors? (Reference paragraph 2.4)

9. Are carpeted floors vacuumed each day, except where high efficiency filters are installed in the ventilation system? (Reference paragraph 2.4)

10. Are sub-floors under raised floors in computer rooms cleaned periodically, but not less than once each 60 days, to prevent buildup of trash and foreign objects? (Reference paragraph 2.4)

11. Are openings in raised floors for electrical cables or other uses protected to preclude the collection of debris? (Reference paragraph 2.4)

12. Are sub-floors checked once each operational day to assure there is no flooding or leaking? (Reference paragraph 2.4)

13. Are electric buffing machines equipped with a three-wire grounding cord and three-prong plug? (Reference paragraph 2.5)

14. Are tools stored in suitable racks or cabinets rather than left on equipment or lying in aisleways? (Reference paragraph 2.6)

15. Are electrically operated vending machines installed outside computer rooms or rooms containing remote terminal units to prevent electromagnetic interference? (Reference paragraph 2.7)

16. Are oil, cleaning fluids, water or other substances spilled on computer room floors cleaned up immediately with approved cleaning materials? (Reference paragraph 2.8)

17. Are coat racks not allowed in a computer room? (Reference paragraph 2.9)
18. Is eating or drinking prohibited within a computer room or while operating remote terminal equipment? (Reference paragraph 2.10)
19. Are signs prohibiting food or drink posted at each entrance to the computer room? (Reference paragraph 2.10)
20. Are materials stored within data processing installation supply rooms neatly stacked and readily reached by adequate aiseways? (Reference paragraph 2.11)
21. Are cross ties, separators, or dunnage used to guard against falling objects? (Reference paragraph 2.11)
22. Is care taken to stack materials so they will not topple over? (Reference paragraph 2.11)
23. Do workers ensure materials are not stacked within 18 inches of ceiling fire sprinkler heads or Halon nozzles? (Reference paragraph 2.11)
24. Are materials stored so they do not project into aisles or passageways? (Reference paragraph 2.11)
25. Are emergency control switches installed in all data processing rooms? (Reference paragraph 2.12)
26. Are emergency control switches readily accessible to the operator and unobstructed at all times? (Reference paragraph 2.12)
27. Are emergency control switches located at designated exit doors? (Reference paragraph 2.12)
28. Do emergency control switches disconnect the ventilation system serving the room? (Reference paragraph 2.12)
29. Do emergency control switches disconnect selective power to all electrical equipment in the room except lighting? (Reference paragraph 2.12)
30. Are emergency control switches plainly marked as to their function and covered to prevent accidental shutoff? (Reference paragraph 2.12)
31. Are only fire fighting equipment approved by the installation fire chief used within a data processing installation? (Reference paragraph 2.13)
32. Are tapes and disk packs stored in separate rooms or vaults? (Reference paragraph 2.14)
33. Are all tape stands and storage racks of sound construction and do not exceed 7 feet in height? (Reference paragraph 2.14)
34. Are there prohibitions about storing tapes and disks in aisles, corners, or on top of equipment? (Reference paragraph 2.14)
35. Is the installation fire chief notified of the location of all tape and (or) disk pack libraries? (Reference paragraph 2.14)
36. Are all non-metal furniture and furnishings within computer rooms made of fire-resistant materials? (Reference paragraph 2.15)
37. Are only metal or other fire-resistant containers used for the storage of card decks, operating manuals, frequently used forms, paper, and other supplies? (Reference paragraph 2.15)

38. Are production outputs from production runs removed from the data processing room immediately upon completion of runs, unless preliminary checking is required? (Reference paragraph 2.15)
39. If preliminary checking is required, is adequate work space provided? (Reference paragraph 2.15)
40. Are only non-combustible wastebaskets equipped with self-closing lids or tight fitting covers used? (Reference paragraph 2.15)
41. Are these wastebaskets strategically located to reduce traffic in the data processing room? (Reference paragraph 2.15)
42. Is smoking not permitted in the computer processing room? (Reference paragraph 2.16)
43. Are signs prohibiting smoking posted at each entrance to the computer processing room? (Reference paragraph 2.16)
44. Are ash receptacles placed outside each entrance to the computer processing room? (Reference paragraph 2.16)
45. When possible, are only non-flammable and non-toxic cleaning fluids used for cleaning data processing equipment? (Reference paragraph 2.17)
46. If flammable or toxic cleaning fluid must be used, is no more than a 1-day supply kept in the computer facility? (Reference paragraph 2.17)
47. Are flammable or toxic cleaning fluids stored in closed containers? (Reference paragraph 2.17)
48. Are only lint-free or treated cloths recommended for this type cleaning used? (Reference paragraph 2.17)
49. Are bioenvironmental engineers advised of routine maintenance procedures that involve the use of cleaning chemicals? (Reference paragraph 2.18)
50. Are battery-operated emergency lighting units installed as a part of the building's fixed wiring system? (Reference paragraph 3)
51. Do these units provide illumination in work areas, hallways, and exits? (Reference paragraph 3)
52. Are these units inspected annually? (Reference paragraph 3)
53. Are these units immediately repaired or replaced when found to be defective or inoperative? (Reference paragraph 3)
54. Is each data processing facility with voltages over 600 volts provided with emergency equipment? (Reference paragraph 3.2)
55. Is emergency equipment situated in a conspicuous and prominent location at each site, well marked, and readily accessible to personnel? (Reference paragraph 3.2)
56. Are the following suggested items included with emergency equipment? (Reference paragraph 3.2)
 - Ground stick (shorting stick).
 - Resuscitation and closed chest heart massage instructions.
 - Emergency phone numbers.
 - First-aid kit at remote facilities.

Hook with hardwood handle.

Rope.

Insulated fuse puller.

Flashlight, non-metallic case, in operating condition, marked with luminescent tape.

57. Are illuminated exit signs provided for each exit and passageway? (Reference paragraph 3.3)

58. Are means of protecting computer equipment available in the event of a water leak or sprinkler activation provided? (Reference paragraph 3.4.1)

59. Is pre-cut plastic sheeting used as a protective covering? (Reference paragraph 3.4.1)

60. In the event of a water spill, will equipment be shut down before it is covered with the plastic sheeting to prevent overheating and possible fire? (Reference paragraph 3.4.1)

61. Has a survey been requested from the civil engineers to determine if a water hazard exists? (Reference paragraph 3.4.2)

62. Is the completed survey kept on file and used during initial briefing of incoming personnel? (Reference paragraph 3.4.2)

63. Are base bioenvironmental engineers contacted and a sound level survey requested when sound levels are suspected to be abnormally high? (Reference paragraph 4.1)

64. Are engineering and administrative controls initiated if sound level survey indicates employees will be exposed to hazardous levels of noise, as determined by bioenvironmental engineers in accordance with AFOOSH Standard 48-19? (Reference paragraph 4.2)