

	PRINCETON PLASMA PHYSICS LABORATORY ES&H DIRECTIVES	
	<b>ES&amp;HD 5008 SECTION 5, CHAPTER 8</b> Egress and Fire Protection Equipment	
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## CHAPTER 8, EGRESS AND FIRE PROTECTION EQUIPMENT

### 8.1 Maintenance of “Means of Egress

8.1.1 Means of egress shall be maintained in accordance with NFPA 101, “Safety to Life from Fire in Buildings and Structures.” Compliance with OSHA 1910, Subpart E, “Means of Egress,” is considered satisfied when the requirements of NFPA 101 are met.

8.1.2 Management shall ensure that:

- A. Every means of egress to an exit is kept clear and unobstructed.
- B. Exit doors are not locked against egress and do not require more than one action to open.
- C. Exit doors are maintained in good operating condition.
- D. Material is not stored in exit stairwells or exit passageways.
- E. Emergency lights, exit signs, and other exit marking systems are maintained in good operating condition.
- F. Fire doors are not blocked open.
- G. Exit discharges including exterior building stairs are kept clean and unobstructed.
- H. Radiation barriers (e.g. roped areas, etc.) do not affect egress routes.
- I. Security features are in compliance with NFPA 101.

### 8.2 Emergency Lights

8.2.1 To provide assurances that battery-operated and emergency generator-operated, emergency-lighting systems will function, management shall ensure:

- A. Emergency light systems are installed, maintained, inspected, and tested in accordance with:
  1. NFPA 101, “Safety to Life from Fire in Buildings and Structures”
  2. NFPA 70, “National Electrical Code”
  3. NFPA 110, “Emergency and Standby Power Systems.”

- B. All emergency light tests are documented and written records maintained.
- C. Emergency lights which are found deficient are repaired within 24 hours, or portable emergency lights are provided at the affected area(s) until the permanent lights are restored to service.
- D. Emergency lights are inspected during emergency light tests to verify:
  - 1. Electrical cords are not damaged or frayed
  - 2. Lamps are not cracked or damaged
  - 3. Units are securely mounted
  - 4. Lamps illuminate within 10 seconds of switching to the backup power supply.
  - 5. Battery powered lights operate for at least 90 minutes.

### **8.3 Portable Fire Extinguishers**

8.3.1 To provide for incipient stage fire fighting, PPPL facilities shall be provided with portable fire extinguishers installed, tested, and maintained in accordance with NFPA 10, "Portable Fire Extinguishers."

- A. Extinguishers installed in facilities are for emergency use in the area where installed and shall not be removed except for use on actual fires. Extinguishers for Hot Work Permits shall be provided by the group requesting the Hot Work Permit.
- B. Wheeled Fire extinguishers are for use by the ESU or those individuals that have received appropriate training.

8.3.2 Management shall ensure that:

- A. The location and type of portable fire extinguisher are in accordance with the requirements of NFPA 10. The relocation or installation of any portable fire extinguisher must be approved by M&O FPE.
- B. New portable fire extinguishers are approved by the M&O FPE prior to purchase.
- C. Portable fire extinguishers are inspected, maintained and tested in accordance with M&O Maintenance Procedures.
  - 1. The inspection, testing, and maintenance of the fire extinguishers, discussed in this Section, Chapter 8, paragraph 8.3, shall be the responsibility of the ESU.
  - 2. The inspection, maintenance, testing of fire extinguishers on welding carts and others not covered in a) above shall be the responsibility of the actual owners/users.
  - 3. All fire extinguishers shall be on the M&O PM program.

- D. Portable fire extinguishers are conspicuously marked and identified.
  - 1. The markings shall include “Picture-Grams” as found in Appendix F of NFPA 10.
- E. Portable fire extinguishers are safely secured by one of the following methods:
  - 1. On hangers or in cabinets
  - 2. They are of the wheeled type
  - 3. Extinguishers associated with Hot Work Permits may be set on the floor.
  - 4. Portable fire extinguishers that are provided for vehicles are mounted or secured to prevent physical damage to the portable fire extinguisher and injury to passengers.
- F. Portable fire extinguishers are not obstructed or obscured from view, with clear access to the portable fire extinguisher maintained.
- G. Immediate corrective action is taken for portable fire extinguishers identified as having a deficiency (e.g., empty, not mounted or missing, broken seal, etc.).
- H. New employees will receive fire extinguisher training upon initial employment through the General Employee Training Program provided by Human Resources. This training shall permit them to recognize, identify and use a fire extinguisher. Thereafter, employees will be given a documented refresher annually.
- I. Employees who are expected to use a fire extinguisher, such as those who will act as a fire watch for Hot Work Permits, will receive additional training which includes live-fire extinguishment. Refresher training shall be conducted annually.

#### **8.4 Non Emergency Use of Fire Hydrants**

8.4.1 To provide assurances that the water supply and fire hydrants are available in an emergency, management shall ensure the following:

- A. Prior permission is obtained from the ESU, the M&ES Environmental Compliance Manager and the M&O FPE prior to non-emergency use of fire hydrants.
- B. The hydrant user installs one valve on each of the ports on the fire hydrant being used. The steamer port is reserved for use by the ESU.
- C. The user provides and uses only approved fire hydrant wrenches when opening or closing a fire hydrant (i.e., no pipe wrenches are to be used).
- D. The user keeps the fire hydrant in a fully opened or fully closed configuration.
- E. An approved portable backflow device or air gap is used to protect the potable water system from potential backflow conditions, where water for purposes such as flushing drains, filling tankers, etc., is drawn from a fire hydrant that is connected to a potable water system.

- F. Special precautions are taken during freezing weather conditions to prevent fire hydrant damage. The fire hydrant and any attached hoses are not left pressurized in a non-flowing condition for an extended length of time.

## **8.5 Fire Protection System Impairment**

- 8.5.1 To ensure that facilities are operated within their design parameters and to minimize the duration and impact of modifications or unplanned impairments to fire protection systems, management shall ensure that:
- A. Fire protection system modifications are reviewed and approved by the M&O FPE.
  - B. Fire protection system operation is not hindered by storage practices, temporary construction activities, or enclosures.
  - C. Corrective actions are implemented for all fire protection system impairments.
  - D. The craft personnel, the ESU, and the necessary engineering support are coordinated to properly and expeditiously restore the fire protection system to service.
  - E. The ESU and M&O are immediately notified of all fire protection system impairments.
  - F. Compensatory measures are implemented as required by the M&O FPE until the system is restored.
  - G. When a fire protection system impairment is identified, the M&O Division, Maintenance Engineering Branch shall initiate corrective actions as soon as possible. Compensatory actions may include, as appropriate, but are not be limited to, the following.
    - 1. Notify the occupants of the building affected by the impairment.
    - 2. Determine when any unsatisfactory housekeeping, storage, or special hazardous conditions need to be corrected.
    - 3. Terminate hazardous operation or maintenance operations and impose “no smoking” regulations until appropriate protection/detection is restored. Cutting, welding, or other “hot work” shall be prohibited until adequate protection is assured.
    - 4. With M&O FPE consultation, determine when the ESU should be present at the facility and/or provide alternate water supplies to the impaired system.
    - 5. As much of the fire protection system shall be maintained in an operable status as possible.
    - 6. Establish a fire watch throughout the area that is affected by the impairment of the fire protection system as required by the M&O FPE.

## **8.6 Fire Protection System Winterization**

- 8.6.1 To minimize the impact of cold-weather conditions on fire protection systems/components (sprinkler, deluge, foam systems, smoke detectors, standpipes, etc.) management shall ensure that:
- A. A written winterization program is in place for each facility. The program shall require that each facility be inspected annually during the month of October to ensure all areas are adequately winterized. The inspection shall include the following items as a minimum:
    - 1. Condition/operation and adequacy of heating systems, e.g. forced air, radiant heaters, portable heaters, etc.
    - 2. Condition/operation of thermostats and filters.
    - 3. Condition/operation/installation of heat tape systems.
    - 4. Draining of sprinkler system drip lines and fire pump hose headers.
  - B. Inspection results shall be maintained for two years in a form that is capable of being audited.
  - C. All areas where fire protection systems are present are provided with sufficient heat and/or noncombustible insulation to prevent freezing and/or equipment damage.
  - D. Heat tape and portable heaters are used only when no other preventive measures are immediately available. If used, these items must be listed or approved for their intended use.
  - E. Heat tape and portable heaters are not used as a permanent means of preventing system freezes, and an engineered solution is provided for deficient areas, e.g. forced hot air, fixed radiant heaters, insulation, etc.

## **8.7 FIRE PROTECTION SYSTEMS TESTING/INSPECTION/MAINTENANCE**

- 8.7.1 The fire protection systems shall be inspected/tested/maintained in accordance with the applicable NFPA Standards, ENG-026, and M&O Procedures

## **8.8 MAINTENANCE PRIORITY**

- 8.8.1 The head of the M&O Division is responsible for assigning appropriate priority to the maintenance of fire systems.
- 8.8.2 The M&O Fire Protection Engineer is responsible to keep the M&O Division Head apprised of the status of fire systems and of any needs for priority maintenance.