



## Physical Environment Portal: Module 7, LS.02.01.35 Leadership

### Features of Fire Safety

This module is titled: Providing and maintaining systems for extinguishing fires.

#### 1. Leadership Orientation: Suppression Systems (LS.02.01.35)

Healthcare buildings have proven to be much safer since the requirement to add sprinkler protection when renovating, remodeling or new construction. However, the suppression system must be installed, inspected and maintained to properly protect the patients, staff and visitors.

Leadership must have a basic understanding of the **Suppression System**, generally referred to as the **Sprinkler System**. This system is a series of pipes running overhead in the interstitial space between the underside of the floor / room above and the lay-in ceiling tiles. Descending from these pipes through the ceiling tiles are sprinklers (also referred to as sprinkler heads or pendants). These sprinklers are activated by heat directly applied to the sprinkler, which causes the sprinkler to activate and allow the **suppressing agent (referred to as “water” going forward)** to descend and quench the fire. To help in spreading water are deflectors at the bottom of the typical sprinkler, creating an arcing pattern of coverage. Anything closer than 18 inches to the deflector will interrupt the calculated spread of the water and possibly interrupt putting out a fire.

Water is delivered to the sprinkler system from either city / municipal water; well water; water tank; or other source of water. For buildings greater than 3 stories a fire pump is used to aid in pulling water from the source and lifting it to the higher floors to put out a fire. These fire pumps are tested based on EC.02.03.05 (Module 4 of the JCPEP) and NFPA codes.

When the sprinkler piping is installed established installation practices are followed that accommodate the weight of the piping and connectors, the suppression agent (i.e. water) and an additional safety factor. Any additional loading of the piping system may cause the supporting system to fail, resulting in flooding and not placing the water where intended to fight the fire. Also, when the sprinkler system is activated in a fire condition the sudden release of pressure through the sprinklers causes the entire system to move, and, if additional weight were added, the system could collapse.

## **Leadership Role in Maintaining the Integrity of the Sprinkler System**

Occasionally funds are approved for telemetry units or other Information Technology projects, which may require pulling wire cables throughout the building. These cable runs may cause issues when penetrating walls (both fire and smoke barriers, see JCPEP Modules 5 and 6) when the penetration [hole] is not properly firestopped. Another risk is improperly hanging these cables on top of the sprinkler piping systems. The Joint Commission and CMS have zero tolerance that prohibits anything being supported by the sprinkler piping system, including incidental contact. This is a condition that must be corrected when discovered, and prevented in all future projects.

## **Other Issues Related to the Sprinkler System**

In addition to prohibiting anything other than components of the sprinkler system being supported by the sprinkler system, there are several other non-compliant conditions identified during survey activity. First, the sprinkler heads themselves. One condition is a large build-up of foreign material that could act as an insulator around the sprinkler, delaying activation. Paint is also not allowed for the same reason.

Using different types of sprinklers in the same space is not allowed. The distribution of the sprinklers is calculated based on spray pattern and density, and then the appropriate sprinkler is installed. Mixing the sprinkler types may create a false dynamic and cause the sprinklers to act in a manner inconsistent with the sprinkler design (which could be an issue in an insurance claim) and delay the suppression of the fire.

Missing escutcheon rings (or the trim rings) around the sprinklers or ceiling tiles not properly seated in their tracks creates problems. A major problem is possibly delaying the activation of the smoke detectors, which are also placed on the ceiling. The *Third Law of Thermodynamics* discusses heat transfer, essentially stating that a principle of heat is that it seeks a cooler location. If the escutcheon ring is missing or the ceiling tile not properly seated, the smoke in a fire condition may enter the gap and begin filling the interstitial space above the ceiling tile, possibly delaying the activation of the smoke detector, and then delaying occupant notification. It only takes a few minutes for a fire to escalate from a small fire to the entire room being involved. Even if the smoke detector delay were only 5 seconds, imagine what that 5 seconds could accomplish in the early stages of a fire. [Please take a look at your watch and see how long 5 seconds is.]

Related to extinguishment is the placement and accessibility of fire extinguishers. Parking equipment such as 'C' Arms (which may need to be started to move) or food carts during meal distribution may restrict either access to or visual identification of the location of the fire extinguishers, reducing response time. Occasionally a fire extinguisher is placed in a wall cabinet that is not obvious and may require signage.

## **What are the common issues found during survey?**

Survey analysis indicate three common deficiencies:

- A. NON-COMPLIANCE: Wires being supported by the sprinkler piping system (EP 4)
- B. NON-COMPLIANCE: Escutcheon plates missing or ceiling tiles askew (EP 14)
- C. NON-COMPLIANCE: Blocked access to fire extinguishers (EP 14)

## **Compliance**

### **A. Establish a policy of zero tolerance for anything on the sprinkler system.**

It must be made clear in all projects that nothing is to be suspended from or contacting the sprinkler piping system.

- a. Begin to remove all non-compliant conditions.

A schedule of mitigation should be developed to remove all material that is in contact with the sprinkler piping system. If discovered during survey, the organization would have 60 days to mitigate.

### **B. Ensure all sprinklers are free of dust, corrosion and paint.**

Pendent sprinklers are obvious as we walk around, and can be visually inspected for obvious signs of dust, corrosion or paint.

### **C. Ensure ceiling tiles and sprinkler escutcheon plates are in place.**

When walking around, check to make sure ceiling tiles are seated in the support track system. At the same time, watch for missing escutcheon (trim) rings around sprinklers.

### **D. Educate all staff regarding maintaining access to all fire safety features and equipment.**

Ensuring carts and other equipment is not in front of fire extinguisher or other equipment, devices or systems begins with leadership.

## **Aging Infrastructure issues:**

Imagine we were having a cup of coffee and you asked me, "George, what are your greatest concerns in healthcare today?" My response would be something like this, "My first concern is for the Healthcare Acquired Infections (HAI) that are affecting approximately 770,000 patients every year, with approximately 70,000 – 80,000 dying. Those patients that come to the hospital for a surgery and die of pneumonia." Next I would share that my "second concern is for our aging infrastructure. Many of our hospitals were built more than 50 years ago, and are still operating with the original equipment in the power plant and throughout our buildings. Many of these systems have been tasked to support the original building design and then required to support later expansions. Over the years many systems have penetrated barriers. Specific to LS.02.01.35, sprinkler piping used to support wiring or other systems over the years must be corrected. Also, those sprinklers that are accumulating dirt or have been painted may not be reliable, and should be mitigated."

### **Survey Scoring:**

Survey findings at LS.02.01.35 EP 4, 5, and 14 are associated with Conditions of Participation (COP) §482.41(b)(1), A-0710; and §485.623(d)(1), C-0231 for EP 25. Non-compliance may lead to a condition level deficiency, depending on “manner and degree” (CMS phrase). Manner and degree consider how often non-compliance is occurring (i.e. trending) and the criticality of the non-compliance. Often findings in the Life Safety Chapter have corresponding findings in the Environment of Care chapter or Infection Control chapters, which aggregate to the Condition Level Deficiency (CLD). The CLD requires a Medicare Deficiency Follow-up Survey within 45 calendar days of the last day of survey. This follow up survey will focus on these survey issues, but may also address any other non-compliant conditions identified at this time.

### **Survey Finding:**

#### **1. Evaluation of Compliance with LS.02.01.35 EP 4**

Surveyors look above the ceiling tiles in the interstitial spaces to evaluate the integrity of barriers and sprinkler piping, as well as other conditions. When sprinkler piping is supporting anything other than the sprinkler system, an observation is written, requiring a Requirement for Improvement (RFI). The RFI must be corrected within 60 days from the end of survey.

Leadership can begin compliance assessment by asking the following:

- a. Asking facilities if they have evaluated the integrity of the sprinkler system in regards to supporting wires or other materials.
  - a. An acceptable response would be that the organization has an inventory of areas with high-traffic wire runs and those areas are targeted for mitigation first. The inventory should also identify second or third phased of mitigation.
  - b. Corrective actions should begin and be on-going.
  - c. Ensure all future projects have a zero tolerance of sprinkler piping being free of all other materials being supported.

#### **2. Evaluation of Compliance with LS.02.01.35 EP 5**

Maintaining a reliable sprinkler system is important as we defend in place and do not evacuate patients, staff or visitors. This includes the physical conditions of the sprinklers, being free from dust, corrosion or paint. Also, missing trim rings (escutcheon rings) or ceiling tiles not in their track may compromise the smoke detection system, delaying occupant notification.

All of these are easily identified by visual inspection.

### **3. Evaluation of Compliance with LS.02.01.35 EP 14**

Blocking access to fire extinguishers, or other features of fire protection may delay or prevent rapid response in an emergency condition.

Leadership can assist in enforcement by supporting education activities for staff identifying the importance of clear access. Managing by walking around provides an opportunity to ask staff where the nearest fire extinguisher is. This is often perceived by staff as an endorsement of the importance of these devices.