FOCUS on FACILITIES
Diocese of Cleveland Facilities Services Corporation

Fire Protection & Life Safety Certification

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After reading this month's *Focus on Facilities – Facility Management* column on maintaining fire protection systems and life safety system compliance in our buildings, it's time to address these two topics from an asset management perspective. Our focus will be on existing building rather than new construction and building renovations.

Why not new construction and building renovations? Well, when it comes to those two design and construction activities there will be an architectural firm along with mechanical and electrical consultants skilled in establishing the design intent and then completing the construction documents based on fire safety and life safety design criteria. Those doing this work will be experienced in making sure the building program will meet all state and local requirements.

For this month's column it is the existing buildings that we want to touch on and raise awareness into existing fire protection and life safety systems, and the need to ensure these facilities keep current with the latest technology while maintaining the original design intent until the space use changes. To achieve this, the building manager and the maintenance person should be familiar with the National Fire Protection Association (NFPA) and NFPA's Life Safety Code 101 which have been embraced throughout the world as standards and/ or codes depending on the location. In the United States every state uses portions or an edition of NFPA 101: Life Safety Code.

Within a building there is both passive fire protection and active fire protection. Passive fire

protection exists in the form of building components controlling or limiting a fire. Existing walls, floors, and ceilings may have been designed and built to resist passage of fire, e.g., 1-hour, 2-hour, and 3-hour fire-rated walls along with walls that make up a smoke zone to resist smoke infiltrating into an adjacent smoke zone.

Active fire protection will be:

- Fire extinguishers
- Fire alarm panels
- Annunciators (component of the fire alarm system that displays the status of the fire alarm system using visible and audible indicators)
- Sprinkler systems
- Smoke alarms & pull stations
- Fire fighters/emergency services
- Automated fire doors
- Thermal (heat) detectors

Active fire protection requires action to be taken to detect and alert, stop or contain a fire. This may involve a person taking manual response, such as using a portable fire extinguisher. On the other hand, this may be a smoke detector that triggers an alarm or automatic sprinkler. A sprinkler head with its fusible link may also melt from the heat (typically 135F to 165F).

There are 5-types of fire suppression systems:

- Water-Based Fire Suppression Systems
- Chemical Foam Suppression Systems
- Pneumatic Heat Detection Tube
- Pressurized Gas System
- Foam Deluge Systems

While water-based (wet pipe) systems are the most common, the appropriate application will be design engineered to extinguish the specific type of fire (oxygen, heat, fuel, or chemical). Fire suppression systems are further defined as "engineered" or pre-engineered" with pre-engineered designed in accordance with NFPA standards and tested to stringent Underwriters Laboratories Inc. (UL) testing protocols. Pre-engineered fire suppression systems are pre-tested to effectively extinguish specific types of fires in special hazard situations.

The most common water-based sprinkler systems include:

- Traditional **wet pipe** sprinkler systems (pipes are constantly full)

- **Dry pipe** sprinkler systems (do not store water in the pipes, pipes fill with water when the system is activated. Since the pipes are dry, this system works well for unheated buildings, like warehouses, where full pipes might burst in cold temperatures.

- **Pre-action**-fire sprinkler systems (dry pipe system, activated by supplemental fire detection system)

- **Deluge** sprinkler systems (dry pipe system, sprinkler heads are always open and the pipes fill with water when activated.)

Life safety compliance within a building is outlined via the original design intent document to include protective systems, evacuation of occupants in an emergency, building services, and maintenance activities. It is recommended that architectural drawings be kept current to assist in providing an annual life safety assessment report should one be needed, and to be in sync with the recommendations noted in this month's *Facility Management* column.

If no original "design intent" document exists, it is recommended such a document be completed for those who may have an interest e.g., fire department, in life safety compliance for the occupants. This document would provide the following:

- Narrative of the building use, e.g., school describing the areas within the building, occupant load, etc.
- Fire suppression system description
- Fire alarm system description
- Evacuation plan with egress diagrams
- Operational features e.g., smoke evacuation description
- Attachment of the fire and life safety checklist (s) used by the facility person
- Other provisional safeguards depending on the building application

A consultant may be the most practical and cost-effective approach to having this initial document completed. In subsequent years building management could possibly keep this document up to date each year based on fire and safety enhancements made.

Aside from the life safety certification required by certain healthcare facilities, there are no mandatory certifications for all other buildings

regarding fire prevention and life safety compliance.

Summary:

Every building and its building system infrastructure requires regular inspection, testing, and maintenance to ensure it can do what its design intent was engineered and constructed to do. Fire and life safety systems are no different. When properly maintained and inspected, fire protection systems are among the most reliable means to ensure the safety of the building and everyone in it. Trusting that these systems will optimally perform in the event of an emergency depends upon the quality of the service and inspections performed on them. If done thoroughly and correctly, organizations can expect to see many benefits.

The benefits of regularly inspecting fire and life safety systems provide advantages for an organization that recognizes reduced maintenance costs, avoidance of fines and penalties from non-compliance, insurance discounts, and the opportunity to identify and address vulnerabilities. The number one reason, without hesitation, will always be the prevention of lost property and/or human life. Secondly, the business within the facility will be able to maintain a continuity resulting in consistent delivery of the services provided.

Building management should strive to:

- Update or complete a fire prevention and life safety design intent document
- Put in place and schedule appropriate fire protection and life safety measures documentation
- Have in place a documented plan for emergencies including an emergency call sheet
- Routinely provide information, safety instructions and training to staff

It is worth mentioning that PM inspections do not take the place of formal safety inspections that may be required by the local fire department so be sure to check with your local inspector. Time planned and well spent on facility management and asset management of fire prevention and life safety must be proactive and not reactive.

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