

## **How to Maintain Fire Systems in Old Buildings.**

Most everyone will agree that fire systems installed in a building are essential to ensuring the safety and well-being of the occupants and contents. One of the ways to ensure that these systems are in proper working order is to have an established preventive maintenance program. The National Fire Protection Association (NFPA) has published a number of standards on the maintenance of fire systems, the most notable of which is NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems." This standard covers the requirements for the majority of fire suppression systems installed in older buildings today, those that are water based suppression systems. However, there are other types of systems that require inspection, testing and maintenance. These include fire alarm systems, passage features (walls, doors, etc.), passive fire protection (firestop), and other special hazard systems (clean agent extinguishing, CO<sub>2</sub>, etc.). Each of these types of systems can have its own article written discussing how to maintain, test and inspect the respective system. However, given time constraints, this article will only briefly describe some of the primary concerns in maintaining all fire systems in older buildings, as well as address some of the safety precautions that need to be taken in the maintenance of these systems.

Older building present unique challenges, and not just in the maintenance of fire systems. Fire alarm systems tend to suffer from product support and part replacement over time as new technologies make older system hardware obsolete. In many cases, specialty parts would need to be made, or entire systems would need to be replaced. Sprinkler heads that have been in service for 50 years (depending on the sprinkler type this time frame could be as low as 5 years for extra high, or greater, temperature rated sprinklers and 10 years for dry sprinklers, to as high as 75 years) need to have a random sampling tested by a recognized testing laboratory. This testing needs to be completed on 10 year intervals.

Older buildings present other challenges, and not just in the age of the fire system equipment. The building itself presents unique challenges in the maintenance and care of the fire systems. Many buildings constructed prior to 1980 contain asbestos and maintenance may require abatement. Structural integrity of older buildings is affected by a number of factors – wind and snow loading, and seismic forces in particular – on a daily basis. These forces tend to weaken or shift the building framework over time. Passage features such as doors, which are an integral part of the egress considerations, can become stuck and unusable. Low clearances due to heavy beams and timbers make passage difficult and may require appropriate head protection.

In order to properly maintain fire systems, it is important to understand what is installed. One of the most popular ways to determine this is to have a fire protection audit, or assessment, completed by a competent fire protection engineer. This audit can address installed systems (suppression, alarm and/or passive systems), as well as structural/building features that are critical to fire protection (doors and walls, smoke management systems, etc.). A properly performed assessment will identify all areas in need of maintenance, specifically, critical areas requiring immediate attention, as well as those that can incorporate newer technologies to minimize the impact of maintenance costs. The findings from an

audit can be prioritized for ease in determining what maintenance work needs to be completed and when. This will allow for accurate budgeting for future maintenance projects.

One type of older building is the historic building, which adds additional challenges. Historic buildings require that preservation be considered in addition to any maintenance work that is being considered. In many cases, the contents of an historic building also have an intrinsic value to the structure and maintenance issues must take these into account. Some shortcomings in the provision of fire systems are acceptable in these types of structures given the historic value of the facility. Alternative levels of fire protection may be (or have been) incorporated to minimize the impact of installing protection on the structure. Again, having an assessment completed by a competent fire protection engineer can aid greatly in identifying areas of concern, and establishing a plan of action for maintenance of the systems.

Once a plan of action is determined, it is necessary to introduce repair personnel into the area to address the identified maintenance issues. As stated previously, in some older structures, the maintenance areas may first require some form of abatement (asbestos, lead, etc). Afterwards, any personnel entering the area should be appropriately protected depending on the hazard. An old warehouse may require steel-toed boots and hard hats, whereas an historic library building may require that the repair technician wear gloves and boot covers. The fire protection audit/assessment report can assist the owner in determining what levels of protection should be required for maintenance personnel to provide protection for the technician, as well as what is being protected by the fire system. However, when in doubt, it is always advisable to follow Occupational Safety and Health Administration (OSHA) guidelines on the appropriate personal protective equipment (PPE) for the given situation.

Maintenance is always a sensitive subject. It is a cost burden to the owner. It has an impact on the current occupant, not just in the repair work of the systems, but also because of the age of the structure. Maintaining fire systems in older facilities does not have to be a burden. A combination of a properly implemented inspection and testing program, combined with a valid fire protection system assessment can make maintenance and repairs cost efficient.