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Sources of Help for Improving Fire Safety

Identifying and selecting the best fire safety solution can be unfamiliar ground. Fortunately, there are several organizations and approaches that can help congregations identify risks and implement appropriate fire safety solutions for historic buildings.

For any congregation, undertaking the installation of a fire safety system can be daunting. Among the first places to start are the local fire and building departments. These agencies are often trained to spot problems, and can offer very useful experience in recommending improvement solutions. Where a local authority doesn't exist, such as in a rural area, the state fire marshall or code administration office can be very helpful. These are often based in the respective state's capital, with regional offices throughout the state.

The main advantage of these agencies is that they are generally most familiar with the appropriate standards, and have a knowledge of the capabilities of local emergency responseorganizations. They will often provide these services without charge.

The potential downside to this approach is that, depending on the level of staff experience, they may or may not have the technical expertise to identify all possible solutions. As such, they may not always be aware of some of the latest, cost-saving technical devices. Another point is that they may not be concerned with the financial aspects of fire safety improvements. As such, cost factors may not be an issue to them. None-the-less, they should be viewed as allies who can offer a very helpful starting point.

Insurance carriers are another readily available source of information. A key advantage offered by these groups is that they frequently have access to large technical staffs who are often used to dealing with more complex problems. They may be up to date on various technologies, as well as possess knowledge about different improvement choices. Since insurance groups have a specific interest in minimizing financial losses and subsequent outlays, they will often provide these services to their clients at no cost beyond normal premium expenses. One other advantage to obtaining insurance group help is that they may be able to identify those improvements which could serve to aid with premium reductions.

The building, fire, or insurance organization may suggest specific improvements to fire walls, fire detection and suppression systems, or other components of the building. When this happens, the key is to find an equipment supplier and installation contractor who can provide the proper level of service. Often, a local contractor represents the preferred avenue for improvement implementation. The main advantage is that these individuals are frequently versed in local requirements, as well as able to provide immediate service. The down side is that they may not always carry a full range of products to solve every problem in the most appropriate, cost-effective manner.

It is therefore important to make sure that the local contractor is able to supply equipment from a manufacturer who has a wide compliment of products. As such they are usually able to supply the best device for a given problem which can result in installation, performance, and maintenance cost savings. Companies such as these are also experienced in historic properties, which can be especially useful where architectural sensitivity is an issue.

One important note is to make sure that the equipment which a supplier proposes to use is in fact designed primarily for fire protection service. A common problem found is the installation of a security alarm panel which can monitor a smoke detector, but is not designed to the same standards as a proper fire alarm panel. To find an equipment supplier, the National Fire Protection Association (NFPA) publishes an annual equipment suppliers and directory which can be very useful. These manufacturers can provide information regarding their distributors and contractors in a given area.

The most common way to find a fire equipment contractor is often through the telephone directory. While this is one approach, it does not guarantee success since there is no assurance that the contractor with the flashiest or largest advertisement is the one who is best suited to solve the problem.

A preferred way to obtain a contractor is through references. The local fire or building department can once again be helpful providing information regarding those contractors with good reputations, and those who may have previously worked on similar projects. A local insurance carrier can also be a source for this information, as can other local heritage organizations such as museums, historic facilities, and religious properties.

When selecting a contractor, always insist on references and then follow through with contacts to the organizations provided. References should be with similar properties, that have experience with the contractor over some period of time. This will help ensure that the contractor understands the type of building and its needs, as well as showing a long term commitment toward responding to any problems which may arise.

When multiple fire safety issues must be addressed, as is common when a number of deficiencies exist or during extensive renovations, there is an advantage to retaining a reputable fire protection expert. These individuals are professionals who are trained in the science and solution of fire, and may work for a variety of organizations including fire engineering firms, and larger cultural property organizations.

The main advantage is that can provide a comprehensive solution package that is technically appropriate while cost effective. They can offer unbiased solutions since they do not work for any one equipment supplier, and are therefore not limited by the supplier's product line. They will generally look at the widest variety of solutions so that improvement funds can be spent in the best manner.

The prime disadvantage is that there will be a cost associated with hiring an expert. If, however, the proper expert is selected, they can save substantial overall costs by presenting appropriate fire safety solutions.

When selecting a fire protection expert it is always important to make sure that fire safety is their main discipline. There are many firms who will claim to be fire experts, but in fact do these services as a side function. Consequently, they may not be well versed in fire behavior and solutions. These experts should also be familiar with the needs and concerns of historic properties, and should have demonstrated experience in these types of facilities. As with contractor selection, the fire protection expert should provide credible references, which should then be checked.

There are two types of organizations where information can be obtained. The first is through historic preservation organizations such as the New York Landmarks Conservancy. The second is through fire protection associations of which the National Fire Protection Association (NFPA) is the most widely recognized. Of particular benefit is NFPA's Cultural Resources Committee which writes NFPA documents #909, Standard of the Protection of Cultural Resources, and #914, Protection of Historic Structures. Each document provides a committee membership list, of which any individual on the list can be contacted for guidance. To obtain information about the committee, contact NFPA at One Batterymarch Park, Quincy, MA, 02269, or at (617) 770-3000.

It is important to make sure that any experts who are hired are in fact knowledgeable in fire safety, and have experience working in historic properties. Preservation and fire safety associations can be good sources of information for identifying technical assistance.

In summary, local fire and building authorities can provide some good information for basic hazard analysis and solution options. Many times, single issue solutions can be provided by local contractors and suppliers, provided they use appropriate equipment. More complex scenarios will often require assistance from a trained fire safety professional.

Fire Growth and Spread

Fires continue to be one of the major threats to historic religious buildings. While the risk of fire can never be 100% prevented, efforts to reduce this threat must focus on three basic issues: controlling fuels, controlling ignition sources, and limiting paths of fire spread.

To properly address fire prevention, it is beneficial to have an understanding of how a fire develops and behaves in a building. Fire is essentially a chemical reaction in which a carbon based material (known as fuel), mixes with oxygen (usually as a component of air), and is then heated by some device or action (ignition source) to a point where flammable vapors are produced.

Historic buildings frequently contain numerous fuels. These may include combustible building materials such as wood and plastic, furnishings, books and manuscripts, records, artifacts and other collections materials, and wood, fabric or paper interior finishes. Flammable liquids such as cleaning solvents, motor fuels, and painting materials may also contribute to a building's fuel load.

Common ignition sources include: electrical lighting and power systems, heating and air conditioning equipment, heat producing conservation and maintenance activities, and electric office appliances. Arson is unfortunately one of the most common threats to historic buildings and must always be considered in fire safety planning.

When an ignition source comes in contact with a fuel, the combustion process starts. The typical accidental fire begins as a slow growth, smoldering process which may last from a few minutes to several hours. The duration of this "incipient" period is dependent on a variety of factors including fuel type, its physical arrangement, and quantity of available oxygen. During this period, heat generation increases, and light to moderate volumes of smoke start to show. The characteristic smell of smoke is usually the first indication that an incipient fire is underway.

As the fire reaches the end of its incipient period, there is usually enough heat to permit the onset of open, visible flames. Once this happens, the fire dynamic changes from a relatively minor situation to a very serious event. Rapid flame and heat growth will follow, with ceiling and upper room temperatures exceeding 1,800° Fahrenheit. Flames can ignite adjacent to combustible contents, while the safety of occupants in the space become seriously threatened. Within 3 to 5 minutes, room temperatures may be sufficiently high to cause room "flash." At this point, most combustible contents in the space will ignite and be destroyed, and human survivability becomes impossible. Smoke generation in excess of several thousand cubic feet per minute will occur, obscuring visibility and impacting contents remote from the fire.

If the building is structurally sound, heat and flames will consume all remaining combustibles and then self extinguish. However, if wall and/or ceiling fire resistance is inadequate (i.e. open doors, wall/ceiling breaches), the fire can spread into adjacent spaces, and start the process over. If the fire remains uncontrolled, the complete destruction or "burn out" of the entire building and contents may ultimately result. In large religious buildings, fires commonly spread through door openings and wall cavities, so that the entire building falls victim.