

Implementing a Fire Protection Inspection, Testing, & Maintenance Program for Water-Based Fire Protection Equipment

History has shown that some of the largest industrial fires have occurred when systems were out of service, or impaired.

By Walter S. Beattie



Many corporations require that all of their facilities be provided with automatic sprinkler protection to protect their employees and preserve corporate assets. Municipalities may also require facilities within their jurisdiction to be provided fire protection systems, such as sprinklers, alarms, and various special protection systems to protect the community and emergency responders. Fire protection systems are a significant part of the building systems as a whole, and as such, require maintenance and care so that they perform to their expectation in the event of a fire.

As the safety professional in your fa-

city, you, your fellow managers, and co-workers are counting on these systems to protect your facilities, processes, and people. As with any emergency system, the time to test its readiness is not during a fire. Do not allow the presence of the sprinkler heads to lull you into a false sense of security. The best way to know that your systems are ready is through a documented inspection, testing, and maintenance (ITM) program. The primary standard in use in most companies and municipalities is NFPA® 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*. NFPA 25 establishes the minimum requirements for the periodic inspection,

testing, and maintenance of water-based fire protection systems. It is not an optimum standard. Rather, it specifies the minimum care required to maintain the system in an operable condition, and we should recognize that the level of action required by NFPA 25 is the base from which we should start and improve upon it to meet the needs of our facility.

The three main areas of a comprehensive program include:

- **Inspection:** A visual examination of a system to verify that it appears to be in operating condition and is free of physical damage.
- **Test:** A physical trying or operation of a system, or part of a system, to ensure or prove that it is functioning properly, as intended, or to an acceptable standard of operation.
- **Maintenance:** The work performed to repair and/or maintain equipment in operable condition.

NFPA 25 states that the property owner or designated representative is responsible for properly maintaining a water-based fire protection system. The designated representatives may be the building occupant, management firm, or other person specified in a lease or contract. The building owner may elect to outsource the ITM services to a sprinkler contractor or other inspection, testing, and maintenance service. When the service is contracted to others, the building owner is typically the responsible party who should be overseeing the work, reviewing reports, and authorizing repairs when needed.

There are many advantages of having a good fire protection ITM program. You will verify that all fire protection valves are open and the systems are in service. The operation of the equipment is verified by actually operating and testing each device on the system. Alarms will be verified from the devices to the alarm control

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panel and from the panel to the alarm receiving company. In setting up the program, you must decide if it is in your best interest to perform this work with in-house employees or with the use of contractors, usually established fire protection companies who install, inspect, test, and maintain systems on a daily basis.

Qualifications of People Performing Tasks

NFPA 25 states that a qualified person or company must perform ITM tasks. A qualified person or company is competent and capable and has met the requirements and training in a given field acceptable to the authority having jurisdiction (AHJ). A qualified person is not required to be an engineer or hold a degree or certification. A qualified person should be competent, trustworthy, intelligent, and reliable. They should have training on the hazards, fire protection systems, and specific equipment they will be inspecting, testing, and/or repairing.

NFPA defines the AHJ as an organization, office, or individual responsible for enforcing the requirements of a code or standard or for approving equipment, materials, an installation, or a procedure. So, who is the AHJ? That depends upon your location or situation. If you live in a municipality that has an organized structure for safety, it may be the fire chief, fire marshal, building inspector, or other official. Your insurance carrier may act as the AHJ. In some companies, a risk manager or other management head may set policy and procedure, and that person acts as the AHJ. Many facilities will need to respond to multiple AHJs, and the most stringent requirements generally prevail.

In-house ITM Program

Many companies utilize their own employees to perform ITM on their fire protection systems. Using in-house employees has advantages. The employees take ownership in the care of the systems. They will be familiar with the location of each component of the system and will be confident in the understanding of its operation. Providing training for an in-house program can especially pay off when an emergency situation arises—there will be expertise available to respond immediately. Your facility emergency response program will be strengthened with this in-house expertise. They will be able to take prompt action to mitigate losses and work with the emergency responders, such as the fire department or hazardous materials teams.

Outsourced ITM Program

Management has many financial challenges in today's market. To meet these financial challenges, many companies have reduced their employee payroll and outsourced many tasks. One of the tasks outsourced is the inspection, maintenance, and testing of the fire protection and alarm systems. Outsourcing services can offer budget flexibility and control and allow management to purchase only the services they need, when they need them. It also reduces the need to hire and train staff in the completion of specialized tasks. In the end, outsourcing fire protection tasks

may reduce immediate capital and operating expenses.

Using contractors to perform ITM services has advantages. Contractor may be more familiar with details of fire protection equipment because they work on them daily and have experience in the care required for the system. Selecting a competent contractor that employs well-trained and quality people is important. The people servicing your equipment should be well trained and certified by an industry-recognized organization. If your state or municipality has minimum licensing qualifications, ask for the documentation certifying the employees. People holding NICET Certification offered by the National Institute for Certification in Engineering Technologies have demonstrated mastery of key skills. NFPA offers training and certifications in various competencies. Also, you must develop a relationship with your contractor and trust their people who are assigned to service your systems.

There are disadvantages in depending on contractors to fully service your fire protection systems. Contractors are trying to be profitable, just like your company. They are going to perform their work as efficiently as possible in the least amount of time as possible. They may not be familiar with your company philosophies and culture. Their focus is solely on your fire protection system and ensuring they are maintained to the minimum criteria, or as negotiated in the servicing contract.

Speaking of contracts, if you have contracted service, what does it include? Is it providing only quarterly or annual servicing? Like most companies, fire protection contractors offer various levels of service. You may purchase any amount of servicing and testing, whether it meets the minimum requirements of NFPA or not. The ITM program is the responsibility of the building owner and/or occupant. Gaps between purchased services and required minimum service are your responsibility.

Combining In-house and Outsourced ITM

A good compromise for many companies is to develop a program relying on both in-house and outsourced resources. The cost to have a completely outsourced ITM program that also meets NFPA and some of the daily and weekly requirements can be very high. The lack of in-house knowledge can result in serious mishandling of the systems during an emergency situation when they are most needed.

Using employees to perform daily and weekly visual inspections and checks of the fire protection system should not be a great burden upon your labor resources. It takes very little time to perform visual checks of items, such as confirming that a riser valve is open, that the temperature is adequate in a dry pipe valve house or fire pump house, that there are no unexplained system leakages at risers, that equipment is clear of obstructions, and that gauges indicate appropriate readings.

Many companies have ITM programs that handle inspections and some testing in house. Testing of inspector's test water-flow alarms and main drains might be performed by employees, while more involved testing is performed by contractors. Some companies have an in-house program and have sprinkler contractors perform annual and five-year ITM. This incorporates

in-house expertise that is immediately available for questions or handling routine issues. In the event of an emergency situation during working hours, there are knowledgeable people on site to quickly respond to the situation. Contractors provide additional expertise to ensure equipment is operating properly. Dry pipe valve trip tests, deluge valve trip tests, fire pump annual flow tests, standpipe flow tests, and backflow preventer tests may be performed by a contractor who will provide expert evaluations of the internal condition and functionality of the equipment. Contractors have the equipment needed to perform testing, saving the expense of purchasing hoses, fittings, nozzles, calibrated gauges, and other testing equipment.

Documentation

Regardless of the ITM program you implement, documentation is required to ensure the inspections and tests are being performed in an appropriate and timely fashion. The method of documentation may be designed to meet your system parameters. Weekly and monthly inspections performed by a single person who visits each valve may be on a single sheet and initialed for each device and signed and dated before filing. If your program incorporates many people performing inspections by department, checklists posted at riser locations may be dated and initialed to verify inspections. The documentation system may be a paper system or an electronic system that uses electronic readers. Maintaining good ITM records will provide you with a historical record of the equipment. You will be able to compare current test data with historical data to track any deterioration in the equipment's operational performance.

Impairments

History has shown that some of the largest industrial fires have occurred when systems were out of service, or impaired. An impairment occurs when any alarm, fire, or explosion suppression system is shut off or otherwise taken out of service, completely or in part. While it is recognized that impairments are necessary during testing, maintenance,

renovation, new construction, or because of equipment failure, you must understand that your facility is in greater jeopardy of major loss during an impairment. When an impairment is planned or occurs accidentally, precautions must be taken to provide temporary protection, reduce hazards, and ensure prompt restoration.

Your facility's human element safety program should include a comprehensive written fire protection impairment handling program. The impairment program outlines the measures to be taken before, during, and after any impairment to ensure that increased risks are minimized and the duration of the impairment is limited. There should be an impairment coordinator designated to oversee your impairment program, with this person having designated individuals to oversee the program implementation during his/her absence. Fewer impairments, especially hidden or unplanned impairments, are found in properly inspected and well-maintained systems. NFPA 25 devotes an entire chapter to the handling fire system impairments.

Additional Considerations

NFPA 25 addresses water-based fire protection systems such as sprinkler, standpipe and hose, fixed water spray, private fire hydrants, water mist, and foam water systems. The standard does not address ITM of all components, such as electrical tripping systems or alarm devices. Other standards and codes will also apply, such as NFPA 72, *National Fire Alarm and Signaling Code*, as well as numerous other NFPA standards.

Another very important consideration to be aware of is *change*. The property owner or designated representative is responsible for the evaluation of the fire protection system when occupancy or process changes are made. When the occupancies or the processes change, new materials are introduced into the building or process, or when storage conditions change or other significant changes are made, an evaluation should be performed to ensure the fire system is capable of protecting against the hazards.

This evaluation is not considered part of the normal ITM program identified in NFPA 25. ITM performed in accordance with NFPA 25 does not address the adequacy of design criteria or the capability of the fire protection system to protect the building or its contents. It is not the role of a sprinkler contractor to determine the adequacy of the sprinkler system or water supply. That is the role of the building owner or his designated representative.

Conclusion

Whether your management opts to maintain your fire protection systems using in-house employees, out-sourced contract services, or a mixture of both, it is important that management and employees are trained in the system operation and valve locations. Your staff should be aware of how the fire protection systems work, the location of fire control valves, and other key components of the systems. In the event of a fire or other emergency at your facility, your emergency plans should be implemented immediately. **OHS**

Walter S. Beattie, CSP, CFPS, CSHM, is President of Beattie Fire Protection & Risk Consulting, LLC. He has worked in the highly protected risk (HPR) insurance field since 1979 in various technical capacities and has extensive manufacturing process fire protection experience in many industries. He was active in the volunteer fire service for fire, hazardous materials response team, and ambulance for more than 30 years, holding line officer and training positions; served as a principal member of several NFPA committees; and is an active member of American Society of Safety Engineers Council on Professional Development and ASSE Fire Protection Practice Specialty Advisory Committee. His website is <http://waltbeattie.com/>.

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