Executive Analysis of Fire Service Operations in Emergency Management

Establishing Policy for the Restoration of Activated Automatic Fire Sprinkler Systems (AAFSS) in the Suffolk Department of Fire and Rescue's Community.

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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Abstract

After two calls for service involving activated automatic fire sprinkler systems (AAFSS) were resolved differently, the Suffolk Department of Fire and Rescue (SDFR) determined it needed policies to guide the restoration of fire suppression systems. This action research project sought to develop procedures for restoring such systems based on investigations into industry standards, case law and best practice. Data was collected from literature reviews, interviews and surveys to establish the AAFSS policies of other fire departments, and the legal and technical aspects of AAFSS restoration. Results of the research concluded that no industry standard exists for AAFS restoration. Recommendations were developed into four policies that delineated procedures for AAFSS events, including “red-tagging” activated systems, Fire Marshall notification and posting a fire watch until the system is professionally restored.
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Table of Contents

Certification Statement ........................................................................................................ 2
Abstract ............................................................................................................................... 5
Introduction ......................................................................................................................... 9
Background and Significance ............................................................................................ 10
Literature Review ............................................................................................................... 13
Procedures .......................................................................................................................... 15
Results ................................................................................................................................ 19
Discussion .......................................................................................................................... 27
Recommendations ............................................................................................................... 31
References ........................................................................................................................... 33
Appendix A Operations in Sprinklered Buildings Proposed Policy .................................. 37
Appendix B Red Tags Proposed Policy ............................................................................. 43
Appendix C Notification Proposed Policy ......................................................................... 47
Appendix D Fire Watch Notice Proposed Policy .............................................................. 51

List of Figures

Figure 1. Fire Watch Responsibility ................................................................................. 20
Figure 2. Rates of Sprinkler System Restoration .............................................................. 22
Figure 3. Department’s with Policies for Sprinkler Restoration .......................................... 23
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Introduction

Recently the Suffolk Department of Fire and Rescue (SDFR) provided service to two high occupancy facilities that had an activated automatic fire sprinkler system (AAFSS). One facility was a nursing home and the other was a hotel. In both situations the sprinklers were activated, resulting in a discharged sprinkler head. So, once the fire is out what should be done to restore protection in a sprinklered building (Nielsen, 1982)? Each call had a different Incident Commander (IC) who used his opinion, experience, and training to determine how the system should be left before returning it to the responsible party (RP). The problem is SDFR has no clearly defined operating standard that dictates how its members will return a fire protection system (FPS), particularly an automatic fire sprinkler system, back to service after it has been activated, or even if it should be restored by the department. The only outdated policy in effect addresses operations in sprinklered buildings and how companies will respond and react during the fire (SDFR, 1998). There is minimal guidance for a member to follow after an AAFSS.

The purpose of this action research is to limit any ambiguity by developing a standard operating procedure (SOP) for placing an AAFSS back in service as soon as possible after an activating incident, or ensure services is restored with thorough follow up. Data will be derived through review of various National, State, and local laws, codes, and standards as they relate to restoring AAFSS. In addition, a technical review of the various types of automatic fire sprinkler systems used in facilities of various occupancies will also be conducted. Interviews will identify legal ramifications and industry standards for restoring AAFSS. Furthermore, surveys will capture what other fire departments in the Commonwealth of Virginia are doing to mitigate an AAFSS. This body of data will be evaluated and applied to articulate a standard of practice that
SDFR members will use to restore an AAFSS based on legal authority, trade standard, and technical knowledge. This research seeks to answer the following questions:

1. What are the legal aspects of restoring Activated Automatic Fire Sprinkler Systems (AAFSS)?
2. What are other fire departments in the Commonwealth of Virginia doing to restore protection in a sprinklered building after the fire is out?
3. What fire codes are related to restoring activated automatic fire sprinkler systems?
4. What are the technical aspects related to restoring AAFSS?

Background and Significance

During the early months of 2007, SDFR responded to two incidents that involved an AAFSS. The first incident occurred on January 24 when a fire in one of the rooms of a nursing home caused one sprinkler head to activate. Once the fire was extinguished and no extension was found, the AAFSS was shut down at the sprinkler control valve (SCV) to limit further water damage (J. C. Knight, personal communication, April 15, 2007). Battalion Chief Knight, as the IC, made the decision to replace the activated sprinkler head and restore service to the AAFSS. He based his decision on the belief that this action would make the building safer for the occupants in case there was another incident (Knight, 2007). Knight said he felt comfortable restoring the system based on his experience and the fact that the system had just been inspected by a sprinkler company a week prior to the incident (Knight, 2007). Restoring the system included replacing the activated sprinkler head using a replacement head from the sprinkler cabinet (Knight, 2007). After replacing it, the pressure gauges were checked and measured against the recently dated inspection tags (Knight, 2007). Battalion Chief Knight took action to replace the sprinkler head because he was not confident that a fire watch could adequately
Establishing Policy for Restoration of AAFSS

protect a high occupancy structure. A fire watch failure would lead to a system failure, and ultimately had the potential for a large loss of life (Knight, 2007).

The second AAFSS incident occurred in a hotel on February 4. A fire had started in the stairwell causing the sprinkler to discharge (F. T. Adams, personal communication, July 1, 2007). Once again, after the fire was extinguished and no extension was found, the AAFSS was shut down at the SCV to limit further water damage (Adams, 2007). After salvage and overhaul operations were complete and the affected area was cleaned, Battalion Chief Adams, the IC, made a decision that differed from Knight’s (Adams, 2007). In this situation, the IC chose to leave the sprinkler systems out of service (OOS) and required the RP to have a fire watch in place until a certified fire protection specialist (CFPS) could restore the AAFSS to its original condition (Adams, 2007). Battalion Chief Adams, like Battalion Chief Knight, based his decision on his experience and training (Adam, 2007). By not replacing the sprinkler head, Adams knew that the wrong head could not be installed (Adams, 2007). If incorrectly installed, Adams reasoned, the sprinkler system would give rescuers and occupants a false sense of security, particularly if another incident occurred and the system did not work properly, such as discharging prematurely or too late because of the wrong temperature rating (Adams, 2007). Adams believed it was best to require a fire watch, which in turn put the responsibility back on the property owner to get the sprinkler system fixed (Adams, 2007).

The disparity between how these incidents were handled resulted in both IC’s attending the next bi-monthly staff meeting with hopes of obtaining direction from department leadership on the best course of action for handling future incidents. No consensus among the department’s leadership was found. It was determined that more information on the applicable policies of the surrounding jurisdictions was needed. Until a policy decision was made, procedure would be
determined on a case by case basis. The result of this approach is that each time an AAFSS occurs, the department demonstrates its lack of a system of continuity in operations with a common outcome.

Therefore, the focus of this research is to give greater attention to the integration of risk management through incident management at all levels, including strategic, tactical, and planning responsibilities, and to develop and implement a department standard based on national trends (NFFF, 2004). This standard will be based on emergency response policies and procedures that should be developed and championed by its practitioners (NFFF, 2004). Advocacy must be strengthened for the enforcement of codes and the installation and maintenance of fire sprinklers and their systems before and after each fire (NFFF, 2004).

By establishing a department standard that identifies what is expected and required of personnel during emergencies (FEMA, 1999), SDFR would comply with the United States Fire Administration’s (USFA) operational objective of developing a comprehensive all-hazard risk reduction plan for restoring AAFSS (USAF, 2004). Such a plan would reduce the risk of citizen or firefighter fatalities due to operating at a structure fire with an improperly working AAFSS (USFA, 2004).

This research project is based on key concepts discussed in the Executive Analysis of Fire Service Operations in Emergency Management class. An IC’s responsibilities include ensuring the safety of all personnel at the scene of an incident, and post incident operations (FEMA, 2006). Whether responsibility extends beyond the incident is an issue for debate and tends to depend on the condition of the property and the resulting impact of the actions of the firefighters. The consequences of not properly restoring AAFSS could be injuries to both SDFR personnel and the citizens they serve should there be another fire prior to the system being fully
restored by a trained professional. Delayed restoration by a system professional is in direct conflict with the USFA’s operational objective to reduce loss of life from fire-related hazards should a subsequent fire occur without a safety mechanism in place to prevent it from happening or limit its ability to do harm (USFA, 2004).

How SDFR mitigates an AAFSS is really based on an assessment of the potential risk that is left behind should another incident occur. The decision of an IC should include an outcome that ensures that the most lives will be saved and the incident will be stabilized quickly, thus preventing any further damage from occurring. Risk assessment is holistic; most of the fire services budget and focus is on the post-event (FEMA, 2006). However, we must also focus on pre/post-event activities, such as determining what to do to ensure an AAFSS is restored. The intent of this research is to reduce inconsistency and provide each IC with a common standard to follow during the event of an AAFSS.

Literature Review

Sprinklers are one of the best weapons devised to combat fire, but they must be used correctly to get the best results. In order for sprinklers to function at their maximum effectiveness, they often need the help of a firefighting force (Clark, 1991). Sprinklers are an unsurpassable fire protection device when aided by firefighting efforts (IFSTA, 1998). However, just installing a sprinkler system is not the solution; it is a part of it (Coleman, 2003). The rest of the solution involves the performance of ongoing maintenance of the system, especially after any activation of a FPS.

After a fire has been suppressed and the prevailing FPS is OOS, a firefighter should remain posted on scene until the AAFSS has been restored, even if it means leaving him behind when all the other fire department equipment and vehicles have cleared and returned to quarters
(Clark, 1991). Most departments do not want to leave a scene unprotected, but the practice of leaving a firefighter behind to act as a fire watch puts a strain on staffing the equipment and it is not practical for many smaller departments (Nielsen, 1982).

**What is an Automated Fire Sprinkler System?**

An automatic fire sprinkler system is an approved system of devices and equipment that automatically detects a fire using a thermosensitive device that is designed to discharge a certain amount of water in a particular pattern over a specified floor area (IFCC, 2005). It is only activated when a fire generates a sufficient quantity of heat, and will control or suppress the fire once it has been activated (NFPA, 2003). This FPS shall be installed, repaired, operated, tested and maintained in accordance to the International Fire Code by a CFPS (IFCC, 2005).

There are four basic types of automatic fire protection systems: wet-pipe, dry pipe, deluge, and preaction (IFSTA, 1998). Each type presents its own installation problems that are addressed by the National Fire Protection Association (NFPA) (Sprinkler Age, 2003). The mechanics of installing the various types of heads involved in these systems after activation present unique problems (Nielsen, 1982). It is important to note that each type of system requires a different set of steps to reset the system.

This research focuses on the wet-pipe variety of AAFSS since this type of system was involved in the AAFSS incidents described in “Background and Significance” and it is the most reliable of all AAFS systems (IFSTA, 1998). A wet-pipe sprinkler system is a system that employs automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire (NFPA, 1992)
The Virginia Statewide Fire Prevention Code (VSFPC) states that an automatic fire sprinkler system provided and approved by the RP when constructed, shall be maintained in an operative condition at all times (VDHCD, 2005). The City Fire Marshal is authorized to enforce the VSFPC (City of Suffolk, 1998).

The ongoing maintenance and any repair work of an automatic FPS shall be in accordance with NFPA and the manufacturer’s instructions (NFPA, 1992). Such work shall be performed by trained and experienced personnel (NFPA). However, an improperly maintained, repaired, or restored sprinkler system will have direct costs and indirect costs to any fire department (USDHS, 2007). These costs will increase if the improperly restored sprinkler system was a direct result of the fire department’s actions. Direct costs include lives lost, injuries due to fire, and financial loss of property and its contents. Indirect costs include lawsuits arising from losses, environmental damage, psychosocial impact, lost business opportunities and jobs, public safety tax costs, medical and funeral costs, property insurance costs, and lost tax and business revenue (USDHS, 2007).

Procedures
Research was conducted through a review of current literature, personal interviews and surveys.

Books and Trade Journals
A review of the current literature provided little data. Text books and trade journals from the authors’ personal collection, local libraries, the NFA’s Learning Resource Center, and SDFR’s library were examined and indicated that information concerning what a fire department should do after a fire was minimal. There was little to no research available for the author to compare this study with. Most resources simply referred the reader to local codes and policies.
Moreover, very little research addressed a departments moral obligation of restoring an AAFSS to protect the citizens and firefighters.

**Personal interviews**

Interviews with authorities such as city and fire department leaders and sprinkler system experts were conducted either through electronic format or in person to determine the department’s role and responsibility in restoring AAFSS.

Battalion Chief Charles Knight was interviewed electronically and in person at the February staff meeting to capture the account of his actions and decisions as the IC of the nursing home facility AAFSS incident described in “Background and Significance”. Knight has been a Battalion Chief with SDFR for approximately 5 years, with approximately 18 years of experience. (Knight’s emailed interview responses were received April 15, 2007).

Battalion Chief Theodore Adams was interviewed electronically and in person at the February staff meeting to capture the account of his actions and decisions as IC of the hotel AAFSS incident as described in “Background and Significance”. Adams has been a Battalion Chief with SDFR for approximately 5 years, with approximately 20 years of experience. (Adams’ emailed interview responses were received July 1, 2007).

Jimmy Dickens is a Lieutenant with SDFR and the Fire Marshal in charge of SDFR’s Fire Prevention Bureau. He was chosen to be interviewed because of his knowledge of the fire code for the city and the Commonwealth of Virginia. Dickens was interviewed in his office, 400 Market St. on June 15, 2007. The interview questions posed to Dickens focused primarily on the fire code and its application to AAFSS.

David Dodge of Coastal Fire Protection Company is a Technical Advisor and Safety Administrator who has been with the company for 18 years. As a licensed sprinkler installer and
CFPS he was interviewed because his company has installed and maintains the FPS for SDFR. He was interviewed at 3901 Bridge Rd., Suffolk, Va., on November 1, 2007. The interview questions posed to Dodge revealed his thoughts on the best course of action for SFDR when responding to AAFSS and post-incident operations.

Lina Kennedy is the newly appointed Risk Manager for the City of Suffolk. She is considered a resource as counsel when determining a course of action that involves risk either to an employee, or a citizen as result of an employee’s action. Kennedy was interviewed on November 9, 2007 in her office at 107 North St, Suffolk, Va. The interview questions posed to Kennedy indicated her opinion of whether or not SDFR should restore AAFSS and delineated SDFR’s responsibility and obligation to the citizens.

The City of Suffolk’s City Attorney’s Office was asked to assist in researching any case law that pertained to AAFSS. The interview questions investigated whether there were any known cases that involved a public safety agency being sued because of their actions or inactions in restoring an AAFSS. Additional interview questions were designed to determine what the city interpreted as SDFR’s legal responsibility for restoring or not restoring AAFSS, and any responsibility or obligation to the citizens. Unfortunately, despite several attempts to obtain an interview response, the City Attorney failed to give any data.

Survey

A short survey was submitted to Virginia fire departments using an electronic format, Surveymonkey.com, a free online research tool that researchers use to design, distribute, collect, and analyze surveys and their results. The purpose of the survey was to learn what other fire departments around the Commonwealth are doing to restore protection in a sprinklered building after an AAFSS. The survey was limited to Virginia because all localities would abide by the
same Virginia Statewide Fire Prevention Code (SFPC) (personal contact, Jimmy Dickens, June 15, 2007). An exception to this rule applies when a locality adopts any fire prevention regulations that are more restrictive or extensive in scope than the SFPC (VDHCDDBFR, 2005). It was assumed that each department had had experience with a sprinkler system in their area on which to base their survey responses, although there are some departments that primarily serve a small rural bedroom community that may not have a sprinkler system.

According to the Virginia Department of Fire Programs, Virginia has 615 fire departments split among 131 localities (VDFP, 2007). Because of time constraints and resources, rather than send out 615 surveys, the goal was to electronically send the survey to the 131 localities, thus limiting the sample population to locality instead of department. Various search engines such as Google and Yahoo were used to find contact information for each locality. Other means of contact included the 2007 Membership Directory of the Virginia Fire Chiefs Association and the Virginia Professional Firefighters. A limitation to the survey sample size was that all 131 localities did not have a website or other means of retrieving contact information electronically. Consequently, the survey size was reduced to 122 possible respondents. Of the 122 surveys sent, 30 were returned as “non-deliverable” leaving a sample population of 92. The assumption was that all 92 were successfully sent. However, only 71 responded. This is a 77% return of the total surveys successfully sent out.

The survey was designed to ask three close-ended questions. The close-ended questions allowed the author to collect uniform results for easy analysis (NFA, 2004). The first two questions addressed the actions of most Virginia fire departments after responding to an AAFSS. The first question asked if the department placed sprinkler systems OOS and required the RP to post a fire watch until it was returned to service. The second question asked if the department
replaced any activated sprinkler heads and returned the system back to service. Neither question was meant to be answered with opposing answers; a department only made one answer choice. It was assumed that some jurisdictions exercised one or the other option, or a combination of both. The third question asked if those options were policy driven: was there a written policy or procedure that the IC had to follow? The survey was conducted over a two month period from August to October to give ample time for survey responses to be received.

Throughout the research, the greatest limitation encountered stemmed from lack of information. The mention of AAFSS in the literature was limited and interviews revealed how little the issue has been considered by city and fire department leaders. The limitations of conducting data collection through surveys rest with the quantity of the sample. It is very difficult to get a high return of survey responses, particularly when a personal connection to the respondent is lacking.

Results

Research questions are presented in italics and followed with a discussion of the results obtained through literature review, interviews and surveys.

*Question 1: What are the legal aspects to restoring activated automatic fire sprinkler systems?*

According to Dodge, from a practical standpoint, it would be great to leave the scene of an incident with an AAFSS restored to service (personal interview, 2007). However, in such a litigious society, it is not the best course of action. When SDFR does restore such a system, it takes on the liability of doing it correctly (Dodge, 2007). It is assumed that if any fire department restores a privately owned FPS, they assume some or all of the liability for the condition and operation of that system and any subsequent actions until it is certified by a CFPS. However with municipal protections, the SDFR can still be sued for any ensuing malfunction if the firefighters
are not fully qualified, trained, and licensed to check a system out and return it to its original operating condition. Fortunately, the City of Suffolk has had no lawsuits due to such actions or inactions of the SDFR to date (Lina Kennedy, personal communication, November 9, 2007). As it stands, SDFR has no legal authority to restore an AAFSS; it is the RP’s responsibility to do so (Kennedy, 2007).

**Question 2: What are other fire departments in the Commonwealth of Virginia doing to restore protection in a sprinklered building after the fire is out?**

Based on the survey results sent to Virginia departments throughout the Commonwealth, a majority of departments (84%) place an AAFSS OOS and require the RP to have a fire watch until it is returned to its original operating condition.

![Pie chart showing the percentage of departments that place AAFSS out of service and require a fire watch]

**Figure 1. Fire Watch Responsibility**
Some survey respondents added that they do not place the AAFSS OOS, but once the fire loss has been stopped and everything is under control, they turn the system over to the RP who determines when to place the system OOS. Until it is restored, the RP is required to post a dedicated fire watch until it is fully restored by a CFPS. Some respondents would also notify their Fire Marshal to ensure follow up is done. Some respondents based their decision on whether the building was occupied or not. Some departments also used this information as a basis for the decision of resetting fire alarms and any other FPS. Some respondents did not reset a fire alarm. Just as with an AAFSS, they had the RP restore an activated fire alarm, and if it was a faulty alarm, the RP was responsible for placing it OOS and required a posted fire watch. (Refer to Appendix A for the proposed Operations in Sprinklered Buildings policy, under the Post Fire Operations section.)

An alternative to placing an AAFSS OOS is to restore it to its original operating condition by replacing the activated heads from the sprinkler cabinet supply, however very few Virginia fire departments do this. There was a greater number of departments that did not replace an activated sprinkler head than those who put the system OOS. Over two-thirds of the respondents (93%) did not restore an AAFSS. Instead, they required the RP to have a CFPS do the work within a reasonable amount of time. In most privately owned businesses, the fire department has no authority for replacing damaged equipment (Lina Kennedy, personal communication, November 9, 2007). Instead, it is left to the RP to get this done within a minimum amount of time.
Does your department replace any activated automatic fire sprinkler heads and return the system to service?

Yes, 7%
No, 93%

Figure 2. Rates of Sprinkler System Restoration

The survey responses indicated that due to liability issues, an activated sprinkler head would only be replaced as a last resort. Without proper and frequent training, the wrong temperature or style sprinkler head could easily be installed. Also, depending on the material of the pipe, the person who re-installed the head could run the risk of damaging the pipe with cross-threading or breakage. Survey responses related that AAFSS operations included either using a sprinkler clamp or chokes to keep the system in service, or closing the SCV at the smallest zone to keep the remaining system operational. Overwhelmingly, respondents believed that only a “sprinkler company”, “contractor”, “technician”, “plumber”, “fire system installer”, or some other “trained”, “certified”, “licensed”, “specialist” should do any system repair and maintenance. In addition to not restoring the system, respondent specified that the Fire Prevention Bureau or any other code enforcement for that locality would be notified for follow-
up. In some cases, when damaged equipment is left unchecked, some businesses would take a very long time to restore the system, unless they felt some pressure from a code official (Kennedy, 2007). However, under some extreme cases, such as the RP losing revenue due to the business closing down, it is in the best interest of everyone to have repairs completed in a timely manner (Kennedy, 2007) at minimum cost (Dodge 2007).

Whether a department restores the system or places it OOS, it is equally important to know of existing policies that give the IC guidance to base his decision on. Over four-fifths of the survey respondents (82%) stated that they do not have a policy in place that outlines a procedure for handling an AAFSS.

Does your department have a policy to determine whether to restore an activated sprinkler system or not?

Figure 3. Department’s with Policies for Sprinkler Restoration

Several survey respondents stated that like SDFR, their locality did have a policy in place that covered operations in sprinklered buildings, but it did not cover the restoration of an AAFSS, or what to do after the fire.
Survey responses indicated that it is much safer for any fire department to shut down the sprinkler system and require a fire watch be put into place. Only a CFPS should restore and certify the automatic fire suppression system. Until then, the fire department should notify the insurer of the facility that the system is not in working order. This can be accomplished through the local Fire Official or RP.

Question 3: What fire codes are related to restoring activated automatic fire sprinkler systems in the City of Suffolk and who is responsible for its enforcement?

The Fire Marshall is authorized to administer and enforce the Fire Code according to the Code of the City of Suffolk (City of Suffolk, 1998). As the Fire Marshal, Lieutenant Dickens stated that the City of Suffolk and SDFR adopted the VSFP as their code for enforcement. The VSFP may use some elements of a NFPA standard, according to Dickens (2007), however, these standards are minimum requirements and are applied voluntarily (SA, 2003). A jurisdiction may adopt and enforce them locally (SA, 2003), however, the City of Suffolk has not (Dickens, 2007).

Any FPS shall be installed, repaired, operated, tested, and maintained by the RP according to the IFC (IFCC, 2005). According to the VSFPD, section 901.6, fire protection systems that were provided and approved by the RP when constructed, shall be maintained in an operative condition at all times. When such systems are found not to be in an operative condition, SDFR and its Fire Marshal shall be notified immediately (IFCC, 2005). (Refer to Appendix C for the proposed policy on Notifying the Fire Marshal.) The fire official shall order all such equipment be rendered safe in accordance with the Uniform Statewide Building Code (VDHCD, 2005). Once the system is determined OOS and properly tagged (IFCC, 2005), the Statewide Fire Prevention Code in Virginia requires that licensed or qualified personnel repair
any fire suppression systems (VDHCD, 2005). The Statewide Fire Prevention Code in Virginia prohibits unlicensed or unqualified personnel from altering or repairing fire suppression systems (VDHCD, 2005).

When a Red Tag is used, it shall be posted at each fire department connection, SCV, fire alarm control unit, fire alarm annunciator, and fire command center indicating what is OOS (IFCC, 2005). (Refer to Appendix B for the proposed policy on Red Tags.) Until such time that the system is restored, the unprotected building shall be evacuated, or an approved fire watch shall be posted. When utilized, the fire watch shall have no less than one means of notifying the SDFR in case of an emergency, and their only duty shall be to perform constant patrols of the unprotected property to keep watch for fires until such time as the system is fully restored and/or vacant (IFCC, 2005). (Refer to Appendix D for the proposed Fire Watch policy.)

**Question 4: What national fire standards exist that relate to restoring activated automatic fire sprinkler systems?**

The NFPA facilitates the development of over 300 different safety codes and standards (SA, 2003). They use a code-making consensus process that is accredited by the American National Standards Institute (SA).

NFPA 25 is the standard for the inspection, testing, and maintenance of water based fire protection systems (NFPA, 1992). According to the NFPA, the responsibility for properly maintaining a water-based FPS shall be that of the owner of the property (NFPA, 1992). Where the owner is not the occupant, the authority for inspecting, testing, and maintaining such a system shall be passed to another RP through specific provisions in a lease, written use agreement, or management contract (NFPA, 1992). If a FPS has been placed OOS by some other means besides a fire, the RP shall notify the fire department (NFPA, 1992). Corrections and
repairs to the OOS system shall be performed by qualified maintenance personnel or a qualified CFPS (NFPA, 1992).

In case of fire, a post-fire inspection should be made of all sprinklers within the fire area and placed OOS, preferably by an RP. When placed OOS for a prolonged period, it is recommended that a responsible and experienced CFPS be retained to perform all repairs, inspections, and tests before restoring the system to its original condition (NFPA, 1992).

Question 5: What are the technical aspects related to restoring activated automatic fire sprinkler systems?

It may seem easy to simply replace an activated sprinkler head after the water has stopped flowing, but the question is, is it the best course of action? Survey responses indicate that restoration of sprinkler systems gets increasingly more complicated depending on the type, size, and design of the system involved. In addition, replacing a sprinkler head may not be all that is required to restore the system, and a fully-functional test should be performed according to design. For example, installing a sprinkler in a cold storage dry system that has gone wet and subsequently freezes may be a liability exposure, whereas doing the same thing in a motel residential system only makes good sense (Robert A. Neale, personal communication, March 6, 2007). In each situation, the area must be considered and how many heads are affected. In most commercial structures there will be an average of 12 heads in the sprinkler supply cabinet, but they could be made up of different styles and temperature sensitivities (Dodge, 2007). If you have activation in one area, the number of heads activated could exceed the number available to be replaced (Dodge, 2007). Another consideration is if the fire only activated one head and it is restored from the supply cabinet, the cabinet’s inventory must be replaced (Dodge, 2007). It is imperative that any replacement sprinkler have the same characteristics as the original sprinkler...
being replaced (NFPA, 1992). Dodge reports that in an effort to cut restoration costs, some building owners will choose the cheapest route and accept substandard repair work (2007). If SDFR were to replace a head, there is no means of enforcing a requirement to have a CFPS certify its repair, or purchase a replacement for the used sprinkler head.

One survey respondent recommended using the spare head and a wrench to replace the activated head. After replacement, the RP should be advised to have the system checked by his CFPS and replace the used items as required by code. The Fire Marshal's Office should be notified and an inspector could follow-up the next business day. Placing a sprinkler system OOS should be a last resort option. The national standard specifies that it is imperative that any replacement sprinkler have the same characteristics as the sprinkler being replaced. If the same temperature range, response characteristics, spacing requirements, flow rates, and factors cannot be obtained, a sprinkler with similar characteristics should be used, and the system should be evaluated to verify the sprinkler is appropriate for the intended use evaluated by a CFPS (NFPA, 1992). An untrained person will not know the difference; therefore it is best to leave system repairs to the specialists.

Discussion

There is plenty of research data describing what to do before a fire at a sprinklered building, such as preplanning. There is also a plethora of information describing what SDFR should do while operating at the scene of a fire inside a sprinklered building, such as the IC planning for accountability, safety, post-fire operations, etc. But there is very little data to guide SDFR in what to do after a fire in a sprinklered building and how to restore the AAFSS. Survey results and the National Fire Academy indicate that some fire departments do not allow ICs to reset alarm or sprinkler systems due to legal considerations (USDHS, 2007). Instead, the IC is
allowed to contact a maintenance person or technical expert from the occupancy to reset the system due to its unique operations. Until such time as the system is restored, a fire watch made up of either fire department personnel or onsite workers as suggested by the IFC would be established anytime the system is OOS (IFCC, 2005). The issue however, is whether this is the correct procedure to ensure the best protection of the occupants if there is another fire. Most departments do not want to leave a scene unprotected, or what is perceived as being unprotected (Nielsen, 1982). But the practice of leaving a firefighter behind to act as a fire watch puts a strain on staffing the equipment and it is not practical for many smaller departments (Nielsen, 1982). SDFR does not want to assume the responsibility for restoring technically unique systems as indicated by our Risk Manager (Kennedy, 2007) and agreed upon by Mr. Nielson (Nielsen, 1982).

Clark differentiates between two main types of activity involving an AAFSS: operations at the fire and preparation before the fire (Clark, 1991). A third division of activity could be added: those actions following a fire and restoration of the AAFSS to its original operating condition before the next fire. Since the majority of devastating fires in buildings with AAFSS can be attributed to some type of human error, the system’s ability to work prior to and after every fire must be assured (NFPA, 2003). There is a moral obligation to restore any FPS to its original condition prior to releasing the property to the RP. However, it is difficult to leave the system OOS and wait for a CFPS to respond before restoring the system to its original operating condition. Most CFPS want to do this because it is their livelihood and they want the financial benefits (Dodge, 2007). But what do fire service members on scene until the CFPS arrives? Most fire agencies are very divided on the question of the moral obligation and legal responsibility of maintaining sprinkler systems (Coleman, 2003).
It is apparent that SDFR has a moral obligation of making sure our citizens have the best protection against fires, even if this means we should have strict fire codes that include a residential sprinkler ordinance. However, the research suggests that SDFR is not a morally-driven service. Morality can be vague and ambiguous, depending on who is enforcing it. Rather, SDFR is a customer service-driven agency based on city policies, codes, and law. As a fire department, it has to meet a minimum standard, but nothing is preventing it from exceeding that standard. However, if it is the goal of SDFR to properly train its members in restoring any FPS after activation, it must consider the cost involved, both in time and money. The alternative of incurring the cost of a lawsuit due to improperly restoring a sprinkler head would certainly be greater (USDHS, 2007). It should be the goal of SDFR to reduce these costs. Since SDFR has no legal authority to restore an AAFSS, according to our Risk Manager (Kennedy, 2007), a kind of checks and balances must be implemented to ensure that the RP takes responsible action, such as having a CFPS restore the system within a minimum amount of time that is followed with a “Red Tag”. This can be achieved by setting term limits when a FPS is repaired and returned to service as determined at the time any FPS is red-tagged (Kennedy, 2007). If the term limits expire without the RP having the system properly restored, the next course of action would be to notify their insurance provider as suggested in a survey response.

Fire departments and ICs can ensure that the FPS is functional, even if it cannot be reset. Sometimes it is possible to isolate a part of the sprinkler system and allow the rest of the system to operate (USDHS, 2007). This can be accomplished with the use of sprinkler chocks and clamps or isolating the activated heads at the SCV. During the time that a FPS is placed OOS, a fire watch should remain on scene (USDHS, 2007). A certified property maintenance person or CFPS should be notified of the OOS FPS immediately. Generally this can be done by the RP. In
some instances, the CFPS that installed the system has an emergency phone number, usually located on the riser above the alarm valve (Dodge, 2007). In case an RP or building maintenance person is unavailable, fire department personnel could make this call and maintain the fire watch if staffing levels allow until the RP is present at the scene or the system is restored by a CFPS.
Recommendations

To prevent any further inconsistency during situations of an AAFSS, Suffolk Department of Fire and Rescue should adopt the following:

- **The revised SOP 3-IV-3**, Operations in Sprinklered Buildings that includes the extended section on Post Fire Operations. In this section, the standard for handling AAFSS after the fire is delineated, including “Red Tagging” any fire protection system; contacting the Fire Marshal or designee; explaining the consequences to a responsible party of having such a system out of service; explaining the consequences of not returning the system to service within the set term limit; and posting a fire watch until the system is returned to service.

- **The newly proposed SOP for Red Tags**. This policy outlines the purpose of the policy for “red tagging” appliances and systems that are deemed unsafe and placed out of service. It includes who has the responsibility of “red-tagging” and what safety concerns are incurred while “red tagging”. This SOP also sets the procedures for implementing the policy, including why something would be “red tagged”, what information to obtain for the tag and report, where to post the tag, what tag to retain and pass on to the Fire Prevention Bureau; notifying the responsible party of any safety implications if said appliance or system is used prior to being replaced or repaired; and what the responsible party would do once the appliance or system is replaced or restored to service.

- **The newly proposed SOP for Notification and Response of Personnel Assigned to the Fire Marshal’s Office**. This SOP directs that the Fire Marshall be notified of any fire suppression system being activated due to a fire, any fire suppression system tampering, multiple fire protection system malfunctions, and any time a fire protection system is placed out of service either by fire department personnel, building official, or property owner.
The newly proposed SOP for Fire Watch. This SOP outlines the purpose and intent of the policy that directs that in the event any fire protection system is placed out of service, either by the property owner of fire department personnel, a fire watch will be required until such time that the system is returned to service. The procedures include who can place the system out of service for a term limit not to exceed 30 days; who will be notified of the system being out of service and having been restored; and mandates that a “Fire Watch Notice” will be filled out that includes the expectations of the person(s) who conducts the fire watch. There is also an attached copy of the “Fire Watch Notice” to go along with the policy.

In addition to these policy recommendations, the results of this research indicate that the SDFR should also change how it responds to activated fire alarms. SDFR has experienced service calls in which fire companies arrive on scene of a fire alarm to find it unfounded, or deemed a false alarm. Most companies will reset the alarm, when in fact it should be the RP’s responsibility for doing so.
References


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Appendix A
Operations in Sprinklered Buildings Policy
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3.01 PURPOSE

To establish a standard procedure for operations in sprinklered buildings and what to do to restore any automatic fire sprinkler systems back to its original operating condition as soon as possible.

3.02 POLICY

In the event that a structure equipped with an automatic fire sprinkler system is reported to be on fire (either by verbal or alarm system notification) the following operations have been established.

3.03 SCOPE

This policy covers the initial emergency or routine operations in sprinklered buildings. It will also address what to do in the event that any automatic fire sprinkler system is deemed out of service by the responsible party.

3.04 SAFETY

In the event of a fire, all personnel shall:

A. Utilize full protective clothing. See SOP I-IV-2, Protective Clothing.
B. Maintain tight control over accountability during interior operations.
C. Utilize hose lines and/or life lines during interior search operations.
D. In the event any fire protection system is shut down, close communications must be maintained at all times between the Incident Commander (IC), the Operations Section Chief (if assigned), and the firefighter responsible for shutting off any such systems.

3.05 INITIAL PROCEDURES

A. The first engine to arrive at the scene will give a conditions report, establish Incident Command (IC), and continue size-up.
B. Determine exact location of the fire by:
   1. Checking with the occupants.
2. Checking the annunciation panel (if available).
3. Checking for alarm bells ringing, this may indicate the involved zone.
4. Checking for water flowing from exterior drains, this may indicate the general area.
C. Insure that evacuation, search and other life safety measures are promptly completed at fires in sprinklered buildings.
D. The second engine to arrive at the scene of a building equipped with a sprinkler system shall position the apparatus at the Fire Department Connection (FDC); however, if the first arriving engine has the FDC at their location that engine should supply the system. The pump operator shall automatically connect to the FDC and await orders from the IC to provide water supply.
E. The minimum fire department hook up to the FDC should not be less than two 2 1/2" hose lines.
F. If a fire is in progress and sprinkler heads have opened, one hundred fifty (150) pounds of pressure should be provided to the FDC. If longer hose lines are required (over 100 feet) between the pumper and FDC, the friction loss in the hose must be considered in hydraulic calculations.
G. Unless it is known for sure that private mains provide an adequate supply, pumpers should be connected to city hydrants, if available. A general rule is not to take suction from hydrants on a private system unless it is known that the system is adequate for the purpose.
H. Send a fire fighter, equipped with a hand radio, to inspect the sprinkler control valve (SCV) to:
   1. Determine if the sprinklers are operating properly.
   2. Open the SCV if it is closed.
   3. Shut off the SCV promptly when the IC decides that sprinkler operations may be discontinued.
   4. Reopen the SCV in the event that the fire rekindles and cannot be controlled by those hand lines which are already in place.
I. Normally, 1 1/2" or 1 3/4" hand lines may be used for fire streams in sprinklered buildings. However, when fires involve unusual hazards, high piled stock or large areas, 2 1/2" hand lines should be considered.
J. Observe the affect of the activated automatic fire sprinkler system on the fire to determine:
   1. If the system is operating properly.
   2. The size and number of hose lines which may be needed to effect complete control and extinguishment.

3.06 VENTILATION PROCEDURES
A. Effective control of fires in sprinklered buildings requires proper ventilation. Whether such ventilation is accomplished by conventional means or by utilizing on site built-in automatic systems, the following steps must be accomplished:
   1. A fire fighter equipped with a hand radio must be sent to the SCV to stand by.
   2. Hose lines must be ready, charged, and in position for confinement and control before the sprinklers are shut off.
   3. Truck Company personnel must be in position and should have affected the necessary conventional opening(s) or be prepared to initiate available on site automatic systems before the sprinklers are shut off.
   4. The IC, the Operations Section Chief (if assigned), and both interior and exterior crews must insure proper communications and coordination.
   5. When all of the previous steps have been accomplished, the sprinkler system should be shut down (slowly) to allow proper ventilation to occur and for those members manning hand lines to move in and fully extinguish the fire.
   6. In the event that the hand lines are unable to affect control, the system should be turned on again until additional streams can be brought into position.
B. Initiate prompt salvage and water removal operations to protect records, machinery, storage, stock and furnishings from water damage.
3.07 POST FIRE OPERATIONS

Once the incident has been deemed “under control” and prior to turning the property over to the responsible party:

A. “Red-Tag” the automatic fire sprinkler system, per Red Tags SOP, and place notices at the fire department connection, SCV, fire alarm control unit, fire alarm annunciator, and fire command center.
B. Contact the Fire Marshall, see Notification and Response of Personnel Assigned to the Fire Marshal’s Office SOP, that such a system has been placed out of service.
C. Notify the responsible party that the automatic fire sprinkler system has been disabled and that they should contact a sprinkler system service contactor to put the system back in operation as soon as possible. A term limit as set by the company officer at the time the Red Tag is written.
D. In the event that the term limit expires before the system is restored, explain to the responsible party that their insurance provider may be notified.
E. Until such a time that the automatic fire sprinkler system is restored to its original operating condition, the responsible party shall have a “Fire Watch”.
F. With a fire watch is posted, issue a “Fire Watch Notice”, see Fire Watch Notice SOP, and provide a copy to the responsible party and forward a copy to the Fire Marshal’s office with the accompanying “Red Tag.”
G. Explain to the responsible party that the property will not be protected or if connected to a central signaling station an alarm will not be transmitted.
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Appendix B
Red Tags Policy
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3.08 PURPOSE

To establish a standard procedure for to establish guidelines for Fire Department personnel when it has been determined that a Red Tag is to be either issued or removed.

The City of Suffolk’s Fire Prevention Code (as amended) requires that any device or appliance that is deemed to be unsafe, be placed out of service until such time as the hazard is corrected. According to the International Fire Code, 901.7, a “Red Tag” may also be used to identify that an automatic fire protection system, or portion thereof, has been removed from service, until such a time that the system is restored to its' original operating condition. The vehicle used to ensure that such action is taken, is a two-part form hereafter referred to as a “Red Tag”.

3.09 RESPONSIBILITY

It shall be the responsibility of the Company Officer-in-Charge to determine whether a piece of equipment, appliance, machine, electrical panel, automatic fire protection system, etc. is unfit for operation (i.e. “unsafe”).

It shall be the responsibility of the property owner or responsible party to have any such equipment, appliance, or system be repaired by a certified/licensed repair contractor.

3.10 SAFETY

Company officers are expected to use their experience and best judgment when determining an item needs a “Red Tag”. Personnel are not expected to be experts in electricity, fuel distribution systems, mechanical processes, etc. The purpose of the Red tag is to draw attention to an actual or potential problem that, in the opinion of the company officer, warrants the inconvenience of taking the item out of service.

Fire department personnel are not to attempt to repair or correct any discrepancies with malfunctioning equipment, appliances, or systems. Any repairs or alterations required to correct the problem are the responsibility of the property owner and responsible party.
3.11 PROCEDURES

A. The company officer shall conduct a visual inspection of the item in question to determine whether continued use of the item would constitute an actual or potential danger and a hazard to the occupants of the building or area. If the officer determines that an item is “unsafe”, the item should be rendered safe by disconnecting power, turning off a supply valve, etc., and ensure that a “Red Tag” is attached to the item to warn the occupant that it may be unsafe to operate.

B. Prior to hanging a “Red Tag”, the incident address, incident number, and a brief description of the item will be written on the tag. The “Repaired by” and “Date” sections are to be left blank. This information is to be entered by the technician making repairs, not by members of the fire department.

C. Attach the YELLOW copy of the tag to the defective item, and forward the WHITE COPY to the Fire Prevention Bureau. Since there is an incident number on the “Red Tag”, there is no need to forward a printed copy of the fire report. Fire Department suppression personnel are not authorized to remove a “Red Tag” once it has been issued without notifying the Fire Marshal first.

D. The Company Officer should speak with the owner or responsible party to advise them of the circumstances that have required the tag and that the appliance/device cannot be used until the defect has been repaired/replaced.

E. In the event it is a fire protection system that is “Red Tagged”, an established Fire Watch shall be posted, see Fire Watch Notice SOP. In such a case there may be a term limits set to expedite the quick restoration of said fire protection system. In the event the term limits expire before the system is restored, the responsible party should know that their insurance provider may notified.

F. Upon returning to the Station, the Company Officer, or designee, will complete the FireHouse report, including in the “User Fields” section, of the “Other” tab that a “Red Tag” was used at the incident. Data input into FireHouse should provide the same information as it appears on the “Red Tag”. (See SOP 1-IV-1, Incident Report.) Also include contact information for the property owners insurance provider in case term limits expire.

G. Once repairs are made or the item is replaced, then the “Red Tag” shall be removed and either delivered or mailed to the Fire Prevention Bureau. The Fire Marshal or his designee will match the YELLOW copy to the WHITE copy and indicate in the FireHouse report that the Red Tag was returned to service.
Appendix C
Notification and Response of Personnel Assigned to the Fire Marshal’s Office
3.12 PURPOSE

The purpose of this policy is to establish standard procedures for notifying the “On-Call” Fire Marshall from the Fire Marshal’s Office for a response.

3.13 POLICY

It shall be the responsibility of the Company Officer-in-Charge to determine the cause and origin of all fire incidents in the City of Suffolk. After all reasonable attempts by the Company Officer-in-Charge have been exhausted to determine the cause and origin, then the Fire Marshal’s office shall be notified.

A. If the Company Officer-in-Charge needs assistance from the Fire Marshal’s Office, a request shall be made through the Battalion Chief. The Battalion Chief will then instruct the Emergency Communications Center to contact the “On-Call” Fire Marshall.

B. All requests for the “On-Call” Fire Marshall shall be made prior to the Company Officer-in-Charge leaving the scene. The Company Officer-in-Charge will also remain on-scene until contact has been made with the “On-Call” Fire Marshall.

C. If a Company Officer-in-Charge or Battalion Chief is working a case with a specific Fire Marshal and has information regarding it, that specific Fire Marshal should be notified directly.

C.01 PROCEDURES

A. The Emergency Communications Center shall notify the Fire Marshal utilizing the following procedure:

1. If the Fire Marshall is “on duty” then they will be contacted by radio and/or the city paging system.

2. If the Fire Marshall is “not on duty”, call the “On-Call” Fire Marshall’s home phone number first. If there is no response, then page him/her using the city paging system. The page should include a brief summary of the call.

3. If the Fire Marshal has been paged and no response has been obtained within “five (5) minutes”, page him/her again.

4. If the Fire Marshal has not contacted the Dispatcher within “fifteen (15) minutes” (1 page every 5 minutes), contact the requesting Battalion Chief for further instructions.
B. The Fire Marshal shall be notified and may respond at his/her discretion to the following incidents:

1. Arson of an unoccupied building, or other arson/fire not specifically listed.

2. Vehicle fire if the following conditions exist:
   a) If the vehicle fire is suspicious or incendiary in nature.
   b) There is no evidence, suspect, witness, or owner on the scene.

   *Note: The investigator will request a Suffolk Police Officer to respond and have the vehicle towed to the closest wrecker service compound. The responding Police Officer should complete an Incident Based Report (IBR) and the Engine Company Officer should document on the Fire Report the location where the vehicle was towed.

3. Any fire with monetary loss greater than 25% of a structure which total value is $250,000+.

4. Any commercial structure damaged by fire.

5. Any fire that activates an automatic fire suppression system and “Red Tagged”, per Red Tags SOP.

6. Any suspicious or undetermined fire.

7. Any incident resulting in a personal injury involving a burn or HAZ-MAT.

8. Any incident resulting in a fatality involving a burn or HAZ-MAT.

9. Any incident involving a malicious false call where follow-up information may lead to suspects or a responsible party.

10. Any incident involving life safety Fire Code Violations (i.e., locked exit doors, fire suppression system tampering, etc…).

11. Any questions involving fire code violations that the Engine Company Officer is unable to answer.

12. Any incident involving illegal burning for land clearing with no permit, the burning of insulation off copper wire, or controlled burning which escapes and requires fire equipment response.

13. Any incident involving three (3) or more fire alarm malfunctions in the same fire alarm system within twenty-four (24) hours, involving commercial property.

14. The Fire Marshal shall be notified before assistance is requested from another agency (i.e., Building Inspector, Electrical Inspector, Health Inspector, State Police or Coast Guard, etc…).

15. Any fire incident involving any marine craft or aircraft.

16. Any environmental crime (i.e. illegally disposed tires, paint, chemicals, etc…).

17. Any incident that requires a fire protection system to be put out of service, either by fire department personnel or the property owner, per Fire Watch Notice SOP.

18. Any other reasonable incident/event that requires a Fire Marshall.
Appendix D

Fire Watch Notice
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3.14 PURPOSE

To establish a standard procedure for establishing a fire watch in businesses that have had their fire protection system(s) put out of service (i.e. due to a fire, maintenance, accidental activation, etc…) and before it is restored to its original operating condition.

3.15 POLICY

The intent of this policy is if in the event it is necessary to leave a fire protection system out of service and “Red Tagged”, see Red Tags SOP, because it cannot be repaired or restored in a timely fashion. In those cases, the property owner should establish a fire watch while the system is out of service. Onsite security persons, or members of the department, may be assigned to this duty while the system is out of service. Onsite workers may be used for the same purpose, but it is necessary to be sure that someone is aware of the situation and on guard against any other incident.

3.16 SCOPE

In any incident that any such automatic fire protection system, or a portion thereof, such as an alarm system, standpipes, fire pump, fire sprinklers, or any other specialty system that detects fires or other hazardous materials has been placed out of service, a “Fire Watch” shall be established by the property owner. Suffolk Department of Fire and Rescue will set the expectations of the established “Fire Watch” by issuing a Fire Watch Notice.

3.17 PROCEDURES

1. Once it is deemed necessary to place a fire protection system out of service, the Incident Commander shall require the property owner to establish a fire watch until such a time that the system is restored to its original operating condition, no later than 30 days after the incident.
2. The Fire Marshal shall be notified that a fire protection has been placed out of service, the business type and location, and the expected duration that the system will be down, per Notification and Response of Personnel Assigned to the Fire Marshal’s Office SOP.
3. Once it is determined to establish a fire watch a Fire Watch Notice will be issued to the property owner that lists specific expectations of the fire watch. A copy will be left with the responsible party and an additional copy
will be forwarded to the Fire Prevention Bureau for follow up.

4. The person(s) detailed to the fire watch shall:
   
   a. Have no duties other than patrolling the premises as a fire watch.
   b. Make rounds of the premises no less than the minimum number of minutes determined by the Incident Commander, and in such a fashion as to cover all portions of the premises, including outdoor yards and storage areas.
   c. Maintain a written log of the rounds indicating beginning and end times, and any deficiencies discovered.
   d. Make sure all exits are free of obstructions, and functional fire protection equipment is accessible.
   e. In the event of a fire:
   f. Report the incident without delay to the fire department using a telephone (dial 9-1-1), radio, or any other means necessary.
   g. Take steps to notify occupants of the premises of any emergency conditions using public address systems, fire alarm systems, or any other means necessary.

5. Once the fire protection system has been fully restored to its original operating condition, the property owner or responsible party shall notify the fire department of such action, the Fire Watch shall be disbanded, and the Fire Marshal notified.
FIRE WATCH NOTICE

Date:  
Time:  
Address:  
Issued to:  
Title:  

Type of system out of service:  
[ ] Fire alarm  
[ ] Standpipes  
[ ] Smoke management  
[ ] Other (Describe)  
[ ] Fire sprinklers  
[ ] Fire pump  
[ ] Specialty system:  

Due to the inoperability of the required fire protection system, you are hereby notified that you must provide a fire watch guard service to patrol the premises until such time as the fire protection system is restored to its normal operating condition.

WHERE REQUIRED

24-hour-a-day fire watch guard service is required in the following occupancies (check one that applies):

[ ] Residential or institutional locations such as apartments, hospitals, nursing homes, dormitories, alcohol or drug treatment facilities, assisted living facilities, board and care facilities.
[ ] Places of public assembly that are open and in operation.
[ ] Facilities where employees are engaged in 24-hour production or operations.
[ ] Facilities where there may be risk of vandalism, mischief, sabotage, or arson.

Fire watch guard service shall be provided in one of the following ways:

- Contract with fire department-approved security firm.
- Arrange with _________________ Fire Department to hire off-duty firefighters.
- Provide a responsible employee whose sole responsibility is fire watch guard service as specified below.
FIRE WATCH GUARD SERVICE

The role of the fire watch is to patrol the premises on a regularly scheduled basis, and in the event of a fire or other emergency, notify emergency personnel and occupants.

The fire watch shall:
- Have no duties other than patrolling the premises as a fire watch.
- Make rounds of the premises no less than ______ minutes apart, and in such a fashion as to cover all portions of the premises, including outdoor yards and storage areas.
- Maintain a written log of the rounds indicating beginning and end times, and any deficiencies discovered.
- Make sure all exits are free of obstructions, and functional fire protection equipment is accessible.
- In the event of a fire,
  - Report the incident without delay to the fire department using a telephone (dial 9-1-1), radio, or fire alarm box.
  - Take steps to notify occupants of the premises of any emergency conditions using public address systems, fire alarm systems, or other means.

Received by ___________________________        Witness ___________________________

Distribution: Original: occupant         Copy: NFIRS Incident Report