REDUCING RISKS FROM FALSE FIRE ALARMS

Reducing Risk from False Fire Alarms
In Appleton, Wisconsin

Eugene R. Reece, Jr.

Appleton Fire Department, Appleton, Wisconsin

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.

Signed:_____

Abstract

The Executive Fire Officer Program (EFOP), of the National Fire Academy, incorporates a class on Leading Community Risk Reduction. This class instills the importance of community risk reduction for Executive Fire Officers.

In evaluating risk within the City of Appleton Fire Department, the response to false alarms was determined to be the highest number of calls for service excluding emergency medical calls. Fire service statistics have identified responding to and from calls for service as the second leading cause of firefighter fatalities. Under current budget constraints, the department has been tasked with reducing costs associated with services provided.

Strategies to reduce the risk to citizens and firefighters from false fire alarms have not been identified in Appleton, Wisconsin. The purpose of this research is to identify strategies to reduce the risk to citizens and firefighters from false fire alarms in Appleton, Wisconsin. Descriptive research methodology was used in answering the following questions. What percentage of false fire alarms is caused by system malfunction? What percentage of false alarms is caused by human error? What steps can be taken to reduce the number of false fire alarms? What department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms?

A literature review, survey, and interviews with departments and non-department members were used in the research. It was determined that improvements must be made in capturing data for the analysis of false alarms. Thorough investigation is critical in identifying causes and developing strategies for the reduction of false alarms.

Strategy development for the reduction of risk from false alarms was based on the concept of the three "E's": engineering, education, and enforcement. Once implemented, the recommendations identified will reduce the risks to citizens and firefighters from false alarms.

Table of Contents

Introduction

The fire service is continually being driven to do more work with fewer resources. As a result, departments must continually evaluate services and adjust programs to meet fiscal and time constraints. With the reduction of funding, increased requests for service, and available time to complete tasks, departments must prioritize tasks and objectives to accomplish. The highest priority when evaluating department services is evaluating means to reduce risk to both the community and firefighting staff.

As a result of evaluating potential funding reductions, workloads and time constraints, Chief Neil Cameron of the Appleton Fire Department questioned the resources required for responding to false alarms. In a memo dated July 10, 2008, (Appendix A), Chief Cameron identified that in fiscal year 2007, the Appleton Fire Department responded to 423 activated fire alarms, which turned out to be false alarms. Of these 423 false alarms, 53 were related to carbon monoxide detectors. False alarm incidents accounted for approximately thirteen and one half percent of the total calls for service in 2007. Additionally, 370 false alarms were identified, which accounted for 11.7% of the total calls for service. Removing emergency medical calls from the 2007 total, the false alarms including carbon monoxide detectors accounted for 33.84% of the total calls for service in 2007 excluding medical responses.

In addition to concerns over the high percentage of false alarms that the department responds to, concerns have been identified relating to the risks exposed to the citizens and firefighters as a result of the response to false alarms. Historically, statistics have identified that responding to and returning from calls for service is one of the leading causes of deaths among firefighters.

The issue of false alarms is not a new issue for the Appleton Fire Department. In the late 1980's, the department enacted a billing process for false fire alarms. The intent of the billing process was to discourage business owners from failing to properly maintain their fire alarms systems resulting in the generation of false alarms. The fee structure was based on a rotating twelve-month period in which business owners are charged for the number of false alarms within the preceding twelve months. This process has generated revenue for the City of Appleton. Based on perception, the billing process has helped reduce the number of false alarms based on the enforcement aspect of paying fees. Property owners with trouble systems are more likely to address system problems then continue to pay increasing fees. In addressing false alarms, the billing process alone is not a successful strategy. This can be demonstrated by the continued high percentage of false alarms that the fire department has identified over the last ten years.

In many cases, it has been identified that reducing provided services could provide both a fiscal and time savings for departments. As the highest percentage of calls for service excluding emergency medical calls, reductions of false alarms can generate a cost savings to the department as well as increasing time for other valuable fire department programs.

In evaluating concerns over the high percentage of false alarms, the problem is that strategies to reduce the risk to citizens and firefighters from false alarms have not been identified in Appleton, Wisconsin. The purpose of this study is to identify strategies to reduce the risk to citizens and firefighters from false alarms in Appleton, Wisconsin.

Using the descriptive method for research, the following questions will be answered to address the identified problem. What percentage of false fire alarms is

caused by system malfunction? What percentage of false fire alarms is caused by human error? What steps can be taken to reduce the number of false fire alarms? What department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms?

By answering the above questions, strategies can be identified and implemented by the department to reduce the overall resources necessary in providing response to this high percentage of calls for service. By reducing false alarm incidents, the department will also reduce the risk to citizens and firefighters as a result of responding to false alarms.

<div align="center">Background and Significance</div>

The City of Appleton is located in Outagamie County in northeast Wisconsin. Appleton is the heart of an area called the Fox Valley where eighteen communities call their home. In 2000, the Fox Valley's population was estimated to be approximately 222,000 (Fox Cities of Wisconsin Visitors and Convention Bureau 2008). Appleton is the largest municipality located within the Fox Valley area. In 2008, the city had over 72,000 citizens living within its borders.

Fire protection for the city is provided by an all career fire department consisting of 101 career employees. The department operates six stations strategically placed throughout the city. Each station provides a home for a single engine company, typically staffed with three persons. The largest station, Station One, serving, as the department headquarters and is the home of an engine and ladder company task force. In addition, the station houses the shift commander who responds as an incident commander during emergency incidents. The station is typically staffed with seven people. In addition to fire

suppression activities, the department also provides a regional hazardous materials and technical rescue response. The department provides first responder level emergency medical response supporting Gold Cross Ambulance, a private ambulance service overseen by the area hospitals. Outagamie County Public Safety Answering Point (PSAP) provides alarm receipt and dispatching for the department. Appleton's Fire Department responded to 3,145 calls for service in 2007. The majority of these calls for service were emergency medical calls accounting for 1,852 or 59% of the total calls for service. Of the remaining calls for service, false alarms made up the largest segment for a total of 423 calls. Of these 423 calls, 370 were for activated fire alarms. Fifty-three of the fire alarm calls were for activated carbon monoxide alarms. This research will not be addressing these types of calls, as they typically require a single engine company response in a non-emergency mode.

As fire service professionals, we are tasked with providing a vital service at a fiscally responsible cost. Each year budgets become tighter with the continued expectation of increased levels of service. Departments must continually analyze methods of providing service with reduced resources. In addition to providing services, departments are tasked to enhance the safety of the citizens they protect as well as the firefighters that serve those citizens.

As a community, the City of Appleton is continually being challenged by the reduction of funding sources. Over the last five years, city services have been eliminated or reduced to address budget shortfalls and tax increasing limitations imposed on local government through state legislation. As a result, each city department in the City of Appleton has been directed by the Mayor to develop contingency plans for the reduction

of individual budgets by as much as twenty percent. Departments must evaluate all
provided services to determine the impact of reduction or elimination of those services on
the quality of life within our community. Fire service reductions also must be evaluated
for the impact of risk to the community and firefighters as well. Reduction of provided
service by the fire department is an emerging issue within our community. As response to
false alarms accounts for over twenty-five percent of our non-medical calls for service,
influencing a reduction of these types of response can provide a means for cost savings to
the community.

During the initial 2009 budget discussions, Chief Neil Cameron (Appleton,
Wisconsin) discussed service reduction potentials as it related to the twenty percent
contingency plan. He identified within this discussion the potential for cost savings
related to the reduction of false alarms. Responding to false alarms requires significant
staff time and can negatively influence the overall safety of the community by diverting
fire department resources from actual emergencies. Additionally, responding to false
alarms increases the risk to firefighters and civilians by exposing them to the risks
associated with responding to and returning from calls for service. Although it is difficult
to measure the full cost of responding to false fire alarms, associated costs would include
loss of staff time, overtime generated from incident responses, dispatching costs, vehicle
fuel costs, wear and tear on the apparatus and equipment, etc. At a time of tight budget
constraints, reduction in any costs can benefit the department and community.

False fire alarm response is a significant problem nationally for all fire
departments. National Fire Protection Association (NFPA) (2008) statistics have
identified that over the ten-year period from 1997-2006, false fire alarms account for

twenty-five to twenty nine percent of the calls for service that fire departments respond to nationally excluding emergency medical calls. In evaluating statistics of the Appleton Fire Department over the same period of time, 1997-2006, false fire alarms accounted for twenty to twenty-seven percent of the calls for service excluding emergency medical calls.

In looking specifically at 2007 national statistics, fire departments respond to over 2,200,000 false alarms, which accounted for twenty-six percent of the calls for service excluding emergency medical calls. During the same time period, the Appleton Fire Department responded to 3,145 calls for service. Three hundred and seventy of the above calls for service were false alarms. Eliminating emergency medical calls, false alarms accounted for twenty nine percent of the calls for service in 2007.

By addressing the reduction of false fire alarms, the department could see a savings in the overall costs for these services as well as an enhancement for the safety of both the firefighters and citizens by reducing the risk of injury during the response to these calls. In addition, reduction of false fire alarms will provide for unit availability to respond to other more emergent issues.

In addressing any issue within the fire service, the evaluation needs to include components measuring not only the value and cost of the service, but also the risk reduction to the community as a result of the service being provided. When evaluating community risk, utilizing the components found in the Community Risk Reduction Model (Department of Homeland Security 2007) will assist in the evaluation process. This model was presented as part of the curriculum in the Leading Community Risk Reduction (LCRR) class presented at the National Fire Academy in Emmitsburg,

Maryland. The components of the community risk reduction model provide direction in the process for assessing community risk, intervention strategies, taking action, building support, and evaluating outcomes. Using this model will assist in analyzing local fire service issues by providing direction on covering important community risk components. In addition, as a component of the LRCC class, each student was required to read and participate in a project relating to the "Solution 2000" (FEMA, 1999) report. The report identified three important components for reducing risk; these were called the three "E's", Engineering, Education and Enforcement. Using these components would assist in addressing the false alarm problem.

In analyzing the issues discussed within this research paper, the following United States Fire Administration operational objectives were considered. Reducing the loss of life from fire of firefighters and responding appropriately in a timely manner to emerging issues. Any reduction of service must be assessed not only for the fiscal savings but also the life safety impact. In addition to looking at the fiscal value of service reduction, the department is challenged to provide the safest working conditions possible for our employees. All methods in reducing life loss of firefighters must be evaluated and implemented if possible. When addressing service reductions, the department needs to analyze the effects on firefighter safety. According to NFPA, the second leading cause of fire fighter fatalities is from incidents relating to the response or return from calls for service. (NFPA, 2007, p.26) Reducing the number of responses to false alarms will reduce the risk associated with responding to and returning from incidents not only for firefighters but for the citizens as well. Both of these would impact the overall reduction of risk within our community. Budget constraints and service reductions clearly is an

emerging issue for all fire departments as we seek to provide adequate levels of service in weak economical times.

In looking at the false alarm problem, an analysis must be conducted to determine the root causes of false fire alarms. Analyzing locally collected data and comparing it to national trends may help identify strategies influencing the reduction of false fire alarms. In addition, evaluating the programs of other departments in false alarm reduction may influence the reduction of false alarms in the City of Appleton.

The first analysis of false fire alarm reduction is to determine the root cause of the activation of false alarms. Analyzing local data will help answer the following questions. What percentage of false fire alarms is caused by system malfunction? What percentage of false alarms is caused by human error? By identifying information within these two questions, the department can then answer the question, what steps can be taken to reduce the number of false fire alarms?

Using the "Solution 2000" concept of the three "E's", the department could put in place strategies to reduce false alarm incidents as well as reducing the risks to firefighters and citizens as a result of the response to false fire alarms.

The Appleton Fire Department has made numerous attempts to reduce false fire alarms over the years through enforcement and engineering; however, the use of education has been very limited. The engineering components have been tied to requiring that alarm systems be installed in accordance with national standards and alarm monitoring be conducted by approved monitoring agencies. The enforcement has been focused on the development and management of a false alarm billing component. This component provides direct billing ability to the property owner when a false fire alarm is

generated. The false fire alarm ordinance (Appendix B) was designed to encourage the maintenance of fire alarm systems in a manner to reduce false fire alarms. Although this has been seen as a revenue generation program, over the last ten years false alarm reduction has not been its focus or direct result statistically. This is evident by the continued responses to false fire alarms in excess of twenty-five percent of non-medical calls for service. To potentially reduce this service level other strategies must be analyzed and programs initiated to enhance engineering and education efforts.

In 2006, the Appleton, Wisconsin Police Department also identified concerns with false alarms. In a memo sent to the Appleton Safety and Licensing Committee (Appendix C), Captain Julie Bahr discussed strategies relating to the reduction of false alarms. These strategies included requirements for permitting alarm companies, enhanced call verification, alarm and monitoring companies meeting industry standards, increased emphasis on the false alarm fees, and provided for provisions to suspend response for users with excessive false alarms. Although these strategies may be successful for security type alarms, not all will work with fire alarms. In a follow-up memo to the Appleton Common Council (Appendix D), Captain Bahr identified that with the adoption of the above procedures, false alarms were reduced by 18.5% during the first quarter in 2007.

The final question to be answered is what department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms? In 1996, the department implemented a response protocol calling for the reduction of response levels when responding to activate fire alarms. In the current incident response standard operating guideline for the Appleton Fire Department (Appendix E), a fire alarm is

defined as any automatic detection system, suppression system or manual pull box that

produces an audible warning locally and/or is received by a monitoring agency. The

correct response consists of two engines, one ladder truck, and a shift commander. All

calls received as an alarm sounding without any additional information, whether it is

from a monitoring agency or the facility itself, are considered as an emergency response

for the first-in unit or units, and a non-emergency response for the second-in or

subsequent units. While en route to the incident should the first-in unit or units obtain

additional information from the dispatch center which confirms that the alarm is a false

alarm, (i.e.: young child pulled alarm, contractor on-scene caused alarm, which has been

verified by a building representative with proper identification), during normal business

hours, Monday – Friday 0800-1630, the first-in unit will downgrade the response to non-

emergency and all other responding units will go available. The person making the initial

size-up will determine if additional units are needed and have them respond in the

appropriate response manner. After normal business hours and on weekends, all

responding units will downgrade to a non-emergency response. The person making the

initial size-up determines if the response shall continue as is, be stepped up to full

emergency response, or if other responding units can go available. In task force response,

the truck and engine will respond in the emergency mode when responding together as

first in units. If during normal business hours, Monday – Friday 0800-1630, the first-in

task force unit downgrades the response to non-emergency, the second-in task force

responding unit will go available. Additional information may cause the initial response

to be stepped up at the discretion of the Incident Commander, Shift Commander, or the

Officer-In-Charge. This decision would be an exception rather that the norm. The Shift

Commander may elect to respond in either mode.

Looking at other options for responses to fire alarms, such as a reduction in

responding equipment may be a means for reducing the risk to citizens and firefighters as

a result of responding to and returning from alarms by reducing the number of apparatus

exposed to the this hazard. In addition, reducing the number of pieces of equipment

responding to alarms would make that equipment available to respond to other more

emergent calls for service.

<div align="center">Literature Review</div>

A review of the causes of false fire alarms begins with the evaluation of statistical

information submitted to the United States Fire Administration through the National Fire

Incident Reporting System (NFIRS) (FEMA, 2008). The NFIRS reporting system

categorizes false fire alarms based on the situation found upon arrival of the fire

department. This system categorizes false alarms and false calls as malicious or

mischievous, system or detector malfunction and unintentional system or detector

operation. This reporting system is utilized by fire departments throughout the country

and data collected is used to identify specific fire trends.

Micheal J. Karter Jr., of the Fire Analysis and Research Division of the National

Fire Protection Association identified in "Fire Loss in the United States 2007" (2008) that

10.1% of false alarms were malicious or mischievous in nature. Thirty-three and a half

percent were identified as system malfunction, 43.1% were identified as unintentional

false alarms, and 13.3% were identified as other false alarms. This information was based

on the analysis of returned questionnaires that he sent out to 3,000 fire departments

across the nation.

Kenneth W. Dugan, PE., FSFPE, writes in his article "Reliability of Fire Alarm

Systems" in Fire Protection Engineering (Winter 2007, p.34-48) that system malfunction

relating to components can be described in a bathtub curve. Failure rates are highest in a

system or with components when just manufactured, when defects or damage manifest

themselves. These failures are sometimes referred to as burn-in failures. Then the failure

rates become much lower and stable for the useful life of the system components.

Failures during this timeframe would be identified as chance failures. The failure rate will

then increase as components reach the end of their useful life when wear out failures

begin to occur. He continues stating that reduction of the above-described failures can be

reduced through the proper maintenance, care, and inspection related to the

manufacturers standards and recommendations. In a well-maintained system, reliability

of an alarm system in terms of response during emergencies is very high.

Glen Kitteringham, M.S.C., CPP wrote in his article "Nuisance Alarms"

(March/April 2008) that fire crews run the risk of injury or death as they respond to

alarms. In addition he reminds readers that they are taken away from legitimate alarms,

create wear and tear on their vehicles and have their valuable time wasted. He identified

that false fire alarms were a legitimate concern for business and property owners as they

contribute to the loss of productivity and revenue. He also stated that false alarms impacts

the safety of workers and residents as they ignore fire alarms as a result of continued false

alarms. Serving as the facilities management director for Brookfield Properties, he shared

the experiences of an approach the management group took to reduce false alarms within

their properties. Beginning their program in 2003, they conducted an analysis of false alarm events. To analyze false alarms, they went back to January 2002 as a start date for reviewing false alarm incidents, which occurred within their buildings. They identified the importance of thoroughly investigating the causes for every false alarm. In addition they created a system to categorized alarm causes as legitimate, false, and unknown.

By thoroughly investigating their alarms, Brookfield Properties was able to clearly understand the situations causing the alarms and was able to specifically address individual issues. Although they spent most of their efforts eliminating false alarms, they experienced a reduction in the area of legitimate alarms as well. False alarms accounted for seventy percent of their total alarms. After investigating the alarms, they were categorized as user error, system malfunction, work done without notification, and damage to the system. Further investigation identified user error as a training issue, system malfunction as a maintenance issue, work done without notification as a lack of communications and damage to the system as either accidental or deliberate. Unknown alarms were an initially high percentage, however, Brookfield Properties felt the biggest reason for a reduction in unknown false alarms was that every alarm was thoroughly investigated as part of their procedures and the actual cause for the alarm was determined and properly categorized instead of simply being identified as unknown.

Brookfield Properties identified multiple reasons for false alarms and in order to address these alarms, they would need to use multiple strategies. They identified the important need for alarm system training for their staff. They identified the training needs for their tenants as well. They identified the need to improve system maintenance and the importance of monitoring and managing workers in the building as a means to prevent

false alarms as a result of work being done without notification. Having a permit process in place when contractors worked in the building helped reduce the overall lack of communications causing a large number of their false fire alarms. When their staff identified contractors who did not have a permit in place, they immediately stopped the work and made the contractor obtain the proper permits. Finally, they passed on city false alarms fines to workers and tenants who caused false fire alarms, enhancing their understanding of the importance of false alarm reduction.

Kitteringham concluded that by breaking the issue of false alarms into smaller components, the false alarm reduction becomes more manageable. Within their properties, they identified a ten percent drop in false alarms in 2004 and 2005 and a further forty percent drop in 2006. Realizing a total fifty percent drop from 2003 to 2006.

Wayne D. Moore, PE, FSPE in his article "Living with a Fire Alarm System" (January/February 2002), evaluated the causes of false fire alarms as it relates to smoke detectors as a component of alarm systems. Moore identified that it is everyone's responsibility for the reduction and prevention of false alarms. He identified the importance of the system designer in using the installation standards and detector sensitivity when placing detectors that are subject to abnormal environments such as extreme temperatures and moisture. He recognized that installers must clean detectors after work is performed within an area of devices. He confirmed that when hot work is completed such as cutting, welding or refurbishing, that detector protection and cleaning is vital to prevent false alarms. He identified the importance of training as a way to help reduce false alarms.

Moore (2007), in his article "Become Part of the Solution, Not Part of the Problem," identified that as the quality of installations of fire alarms increases, false alarms will decrease saving the department and city valuable resources. In addition he identified that these savings could then be placed back into fire prevention efforts further impacting the reduction of false alarms. He identified the importance of trained alarm technicians, who would enhance the installation and maintenance of systems ultimately leading to the reduction of false alarms. Moore (2008) continued identifying the importance of training in his article "The Impact of Training on Fire Alarm System Operational Reliability" in which he identifies the lack of maintenance as a leading cause of fire alarms and that properly trained alarm technicians can significantly reduce the potential of false alarms. Proper fire alarm maintenance relies upon the qualifications of the technician performing the maintenance. A properly trained technician improves the maintenance of the alarm system and a properly maintained alarm system will greatly impact the overall performance of the system.

The City of Roanoke, Virginia, (Alarm Registration Program) instituted an alarm registration program in 2004. They identified that false alarms were a significant drain on law enforcement, fire and EMS service delivery. They found that most false alarms were caused by human error. They identified the importance of instructing everyone on the operation of the alarm and the process for canceling an alarm. The importance of inspecting alarm components, scheduling routine maintenance to ensure proper operation, and the importance of notification to police, fire, and emergency medical services when maintenance is being completed were also seen as strategies in the reduction of false alarms.

The Minneapolis Fire Department (2008, p.19) "Result Minneapolis" identified that during 2007, their department responded to 4,822 false fire alarms, 14.2% of the totals calls for service for the year. In their report, they listed the top ten causes for fire alarms in 2007. Their records identify alarm system activation being caused by maintenance personnel working on the system, construction work and dust as the leading causes. Second was smoke detector activation as a result of proper system response to environmental stimuli. Alarm malfunction is the third leading cause and was identified as improper performance. The forth-leading cause was smoke detector activations due to malfunction where no reason was found causing the malfunction. Local alarm malicious false alarms were identified as the fifth-leading cause and these were identified as manual pull stations being activated. The sixth-leading cause was heat detector activation with no heat conditions. The seventh identified cause was malicious false telephone calls not tied to an alarm system. Sprinkler system activation caused by testing or broken pipes was identified as the eighth-leading cause. Carbon monoxide alarms and central station malicious false alarms with no explanation were identified as the ninth and tenth respectfully.

They identified a two-tiered strategy for the reduction of false alarms, education and enforcement. They identified that the education approach would be directed at occupants beginning with the ten buildings, which generated the most false alarms. They determined that educating occupants on strategies could reduce false alarms. Their second approach through enforcement was considering the implementation of the Underwriters Laboratory (UL) Fire Alarm Certification Program. The UL Fire Alarm

program requires owners to meet standards in regards to installation, maintenance, and

response (Appendix F)

Paul L. Dove (2008, p.6-8) "What are Fire Department Responsibilities?

Combination Residential Security and Fire Alarm Systems", identifies that the fire

service should take a proactive role in the reduction of false fire alarms within any

occupancy type. He identifies that we should thoroughly investigate the events and figure

out what caused the false alarm, what or who was responsible, and how can it be

rectified. He feels this promotes greater customer service leading to the reduction of false

alarms. He stresses the importance of alarm education and that proper devices are

installed, inspected, tested, and maintained in accordance with the National Fire Alarm

Code. Public education, customer service and using the National Fire Alarm Code may

prove successful in lowering household false alarms and assuring the proper installation

of equipment.

Fire Protection Handbook, (NFPA, 2003, p.7-180) identified the importance of

proper training for building staff as it relates to response to an active alarm. The concern

related to the potential delay in fire department notification, staff conducting

investigations leading to potential injury and building staff silencing or resetting the

alarm before it has been transmitted. All of these could be serious in nature and can

prevent the actual cause of the alarm from being determined. In addition, it cautions on

the use of false alarm fees, fearing that these types of fees should be closely monitored so

as to not create an atmosphere of non-transmission of alarms.

United States Fire Administration (July, 2006, p.14) identified that responding to

and returning from fire calls is the third leading cause for firefighter fatality based on

type of duty being performed. On March 3, 2005, Thomas Logan Mower, Fire Police

Officer for the Goodwill Fire Company, Glenolden, Pennsylvania and members of his

department were dispatched to an automatic fire alarm in a residence. As he proceeded to

his vehicle, he suffered a heart attack. He was pronounced dead a short time later. On

April 20, 2005, David Wayne O'Conner, a Driver/Operator for the Memphis Tennessee

Fire Department, and his engine crew responded to a fire alarm in a building. The alarm

pull was determined to be false, and the engine was headed back to quarters.

Driver/Operator O'Conner lost consciousness as the engine proceeded down the street.

The engine's company officer was able to reach over the engine enclosure and activate

the vehicle's parking brake. The apparatus came to a stop on the sidewalk. Firefighters

immediately removed Driver/Operator O'Conner from the driver's seat and initiated

treatment. An ambulance was summoned. Driver/Operator O'Conner was transported to

the hospital, where he was pronounced dead as a result of a stroke. On July 10, 2005,

Firefighter Joseph Harold Evans, of the Bridgeville Volunteer Fire Company, Delaware

and members of his fire department responded to a report of a fire alarm activation.

Firefighter Evans was the driver of an engine company that responded to the incident.

After his arrival on the scene, Firefighter Evans collapsed from a heart attack and he was

transported to a hospital, where he was pronounced dead.

United States Fire Administration (June, 2008) identified that responding to and

returning from fire calls is the second leading cause for firefighter fatality based on type

of duty being performed in 2007. This cause is second to fire ground operations as the

leading cause for firefighter fatalities. In addition to the hazards associated with

responding to and returning from alarms, the report identified two firefighter deaths

related to the response to false alarms, one of which was specifically related to a vehicle accident while responding to an alarm. On August 11, 2007, Todd Whitney Hage a Firefighter with the Wesley Chapel Volunteer Fire Department, North Carolina was the driver and sole occupant of a commercial chassis pumper that was responding to an automatic fire alarm at a school. As Firefighter Hage responded, he swerved to avoid an oncoming vehicle. The pumper he was driving went off the roadway, then rolled and slid into a tree. The vehicle sustained major damage, and Firefighter Hage was killed in the crash. On January 19, 2007, Daryl W. Mutton, a Captain of the North Pulaski Fire Protection District #5, Arkansas died as a result of the response to a false fire alarm. Captain Mutton and the members of his fire department responded to a fire alarm in a residence. The alarm was unintentional, and firefighters cleared the scene at approximately 1825 hours. At approximately 1900 hours, Captain Mutton's family members called the fire department looking for Captain Mutton. He had not been seen since responding to the alarm. He was found dead alongside the roadway as a result of cardiac arrest.

National Fire Protection Association (July, 2008) identified that responding to and returning from alarms was the second leading cause of deaths to firefighters. The document identified that over the past ten years 1998 through 2007, thirty-three firefighters have died as a result of responding to false calls including malicious false alarms and alarm malfunctions.

Jon Nisja (2006, p.3, 13) identified that the fire service has drastically reduced the number of civilian deaths in this country; however, over the last twenty-five years, the number of firefighter deaths has averaged around 100 each year. He stated that the

International Fire Marshal's Association is concerned about the large number of false alarms. He continued that a large number of firefighter casualties occur responding to and returning from calls for service, a high percentage of which are false alarms.

In evaluating the response levels for fire alarm activation, NFPA Fire Protection Handbook (2003, p.7-180) identified that resources dispatched to calls should have the capability of assuming interior attack and operations command in a typical initial attack function. The Handbook uses a guideline for establishing minimum suggested response resources based on the hazard classification of the building. The handbook identifies these classifications as high-hazard consisting of schools, hospitals, nursing homes, high-rise buildings and other high life hazard or large fire potential occupancies. Medium-hazard occupancies consist of apartments, office buildings, and industrial occupancies not requiring extensive rescue or firefighting forces and low-hazard occupancies as one to three family residential occupancies, small businesses, and industrial occupancies. Based on the hazard identification, the handbook identifies the need for a minimum of sixteen firefighters on the scene of a low hazard to a minimum of 26 firefighters on a high hazard. The handbook does not identify a response recommendation for activated alarms specifically.

NFPA 1710 (2001, p.1710-8) identifies an initial full alarm assignment based on tasks being performed. Again this recommendation is based on interior structural firefighting but would include a minimum of fourteen firefighters on the scene for interior structural firefighting. The NFPA document does not distinguish between occupancy types as it relates to a first alarm assignment; however, it does suggest that

additional personnel be available based on tactical or high hazard occupancy as identified by the authority having jurisdiction within the local fire department.

Bernard J. Klaene and Russell E. Sanders (2000, p.238-239) identified that false fire alarms are common. In some areas they are so frequent that special responses are sent to alarm activations. They identify that a high number of alarms causes apathy and lulls firefighters into complacency. They stated that treating automatic fire alarms as false alarms can have disastrous outcomes.

John (Skip) Coleman (1997, p.353-354) identified that a large percentage of calls for service made by departments are a result of alarm systems. Within his community, as a result of the large number of alarms, response was downsized to a single engine company. The incident was managed under an informal command with the company officer conducting the investigation with his unit. He did identify that most cities respond with a minimum of one engine and one truck to these types of calls.

A review of the literature supports the methodology identified within the Solution 2000 report studied in the Leading Community Risk Reduction (LCRR) class at the National Fire Academy. Utilizing the three "E" Engineering, Education and Enforcement as a strategy can significantly reduce false alarms.

 In reviewing the literature, it was discovered that false alarm data is collected in different manners. The most common for collection is the use of the National Fire Incident Reporting System (NFIRS). The information gathered within this system is valuable: however, it does not provide the specifics necessary to answer the question if the cause of false alarms is human error or system malfunction. A more detailed review will need to be conducted locally to identify the root cause of false alarms. By identifying

the root causes, the department can target education, engineering and enforcement programs addressing those root causes. Clearly, the literature identified the need to thoroughly investigate all alarms so a cause can be identified and addressed in the reduction efforts.

The literature supported that education was a leading strategy in addressing the reduction of false alarms. Education efforts need to be targeted to all levels of involved people in the false alarm problem. This includes property owners, occupants, construction workers, alarm technicians as well as responding firefighters. The implementation of education efforts will significantly impact alarms caused by human error. The literature also reiterated that engineering is an important component in false alarm reduction. An alarm system that is properly engineered, inspected, tested and maintained will function as designed and will reduce the number of system malfunction type false alarms. Enforcement should also be used as a tool in reducing false alarms: however, caution should be used with this component and a continued evaluation program needs to be in place to prevent the potential for alarms not being properly transmitted.

The literature supported the concern that responding to and returning from calls for service is a significant risk to firefighters. As the second highest cause of firefighter fatalities, the reduction of responses to any type of call can reduce the exposure to risk of responding to and returning from alarms.

Literature relating to the amount of equipment that a department utilizes when responding to fire alarms was not very specific. Most of the literature related to the response to fire situations requiring interior structural firefighting. If you assumed that the response to every fire alarm would require interior fire fighting, the literature

identified a minimum of fourteen 14 to twenty-six responding personnel based on the type of occupancy.

In summary, the literature reviewed provides information relative to the research questions relating to the problem of identifying strategies to reduce the risk to citizens from false fire alarms. Utilizing this information should assist in addressing the purpose of identifying strategies to reduce risks to citizens and firefighters from false alarms.

Procedures

Research started with a review of literature from information at the Learning Resource Center of the National Fire Academy. Additionally, an Internet and periodical search was conducted looking for available information. The purpose of this research was to obtain information to answer the following research questions. What percentage of false fire alarms is caused by human error? What percentage of false fire alarms is caused by system malfunction? What steps can be taken to reduce the number of false fire alarms? What department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms?

In attempting to answer the first two questions, it was quickly identified that numerous methods are used to document the causes of false alarms. Although many departments utilize the National Fire Incident Reporting System (NFIRS), the specific NFIRS gathered information does not answer the question clearly as to the percentages of false alarms based on human error and system malfunction.

To properly answer these questions as it related to Appleton, Wisconsin, it was vital to conduct a review of the root cause of alarms beyond that listed using the NFIRS situation found codes (Appendix G). Although these codes are used to identify general

causes of malicious or mischievous false alarms, system or detector malfunction, unintentional operation and other false alarms, they do not specifically identify human error versus system malfunction. In evaluating and making recommendations to reduce false alarms, it is necessary to identify the root causes of the alarms.

Using information gathered from submitted incident reports; a review of 370 incidents was conducted for reports identified within the records management system of the Appleton Fire Department as false alarms. By conducting the analysis of the narrative of the individual reports, a clearer picture could be identified as to the root cause of the false alarm as being human error or system malfunction. Based on a review of the incident type and narrative of the 370 false alarms in 2007, 128 could be identified as system related and 184 identified as human error related. Fifty-eight alarms were listed as unknown. A lack of information within the narrative of the report made it impossible to identify the cause of unknown alarms.

In classifying the types of alarms, human error alarms were those that were identified as 710, 711, 712, 713, 714, 715, and 740 from the NFIRS situation found classification. System malfunction alarms were those identified as 730, 731, 732, 733, 734, 735, 736, 741, and 742 from the NFIRS situation found codes. Alarm types 700, 743, 744 and 745 were reviewed individually to determine which category the alarm would meet as it related to human error and system malfunction. These codes are general in nature and accounted for the 58 unknown alarms were reviewed. An individual review of the narrative was conducted on each unknown classified alarm. Based on this review, adequate information as to the exact cause for determining human or system cause was not available.

Further analysis of the human error alarms identified that the most common cause for false alarms as a result of human error is burnt food. These types of calls accounted for 40 alarms of 184 or 21% of the total human error alarms. The second leading cause for human error alarms were activated pull stations, which accounted for 30 alarms or 16% of the total for human error alarms. A concerning factor was the number of alarms caused by a lack of notification. Most of these alarms were found within a non-specific unintentional area and were identified by the narrative. Contractors in the building conducting maintenance causing the alarm accounted for twenty-three alarms or 12.5% of the human error alarms.

Smoke detector activation was the leading cause for system malfunction alarms. Thirty-seven alarms were identified as smoke detector malfunction equaling 28% of the total system malfunction false alarm types. The second leading cause, 26 alarms, was identified as general alarm system malfunctions equaling 20%.

Using data gathered from the NFIRS records of the Appleton Fire Department, a comparison was made with national statistics obtained from the National Fire Protection Association. Table 1 identifies a comparison between local and national statistics. As noted earlier, general NFIRS situation found false alarm identification practices makes it hard to compare human and system malfunction as many of the human factors are captured within the unintentional category.

In addition to evaluating the root cause of the false alarm, an evaluation was conducted on the number of times that units were tied up on alarms when subsequent calls for service were received. The intent of this evaluation was to determine the impact to citizens as a result of crew's unavailability as a result of false alarms. This research

would identify the impacts to citizens as a result of units being unable to respond to

additional calls leading to information that could be utilized in answering the research

question of what changes could be made to reduce the risk to citizens and firefighters as a

result of false fire alarms. Reviewing the false alarm information of the 370 false alarms,

on 53 occasions, when units were on a false alarm, a second, subsequent call for service

was received. This figure identifies that 14% of the time in 2007, the department was

dispatched to additional calls while investigating false alarms. As multiple units respond

to alarms, the subsequent calls would require resources to be pulled from other areas of

the community. It should be noted that a more in-depth review would need to be

conducted identifying the exact number of times that the primary unit on a false alarm

was not available for the additional call for service.

Table 1. Estimates of False Alarms by Type, 2007

	Estimate	Percent Change From 2006	Percent of All False Alarms
Malicious, Mischievous False Call	222,500	+15.0	10.1
System Malfunction	740,500	+2.7	33.5
Unintentional Call	951,000	+11.9	43.1
Other False Alarms (Bomb Scares, etc.)	294,500	-17.0	13.3
Total	2,208,500	+4.2	

Source: NFPA's Survey of Fire Departments for 2007 U.S. Fire Experience

Malicious, Mischievous False Call	25	*	6.8
System Malfunction	91	*	24.6
Unintentional Call	235	*	63.5
Other False Alarms (Bomb Scares, etc.)	19	*	5.1
Total	370		

Source: Appleton Fire Department NFIRS5 Incidents by Type for 2007
* Data not gathered in 2006

A review of information was conducted for the purpose of answering the question what steps can be taken to reduce the number of false fire alarms? Numerous articles and periodical information outlined steps that other communities have taken to reduce false alarms. In addition, information was obtained as to the steps that the Appleton, Wisconsin Police Department has taken to reduce false alarms that may be beneficial when addressing the problem with false fire alarms.

In addition to researching literature, a survey (Appendix H) was developed for the purpose of gathering information from other departments as it related to the false alarm problem. The survey consisted of eight questions used to identify community demographics, percentage of false alarms, the manner and equipment used to respond to false alarms, methods used by departments to reduce false alarms and a question identifying common causes for false alarms. The survey was randomly emailed with a cover letter to 100 fire departments located in Wisconsin. Twenty-four departments, 24% of those surveyed completed and returned the survey. The departments were randomly selected from an alphabetical listing of departments in the 2008 membership directory of the Wisconsin State Fire Chiefs Association.

The first question identified department demographics. Using the department demographic criteria as Career (100% Career), Mostly Career (51-99% Career), Mostly Volunteer (1-50% Career) and Volunteer (0% Career). Thirteen career departments, five mostly career departments, and six mostly volunteer departments responded to the survey. No volunteer departments responded.

The second question identified community size. Eleven departments identified their community population as less than 25,000. Five departments identified their

population between 25,000 and 49,999. Seven departments responded that their

community population was between 50,000 and 74, 999, and one department responded

that their population was in excess of 150,000.

Question three and four in combination were designed to identify what percentage

of the total non-medical calls for service were classified as false alarms. The purpose for

this question was to determine if the problem identified in Appleton was consistent with

other surveyed departments. Of the six mostly volunteer departments responding to the

survey, the following percentages of false alarms were identified; 4%, 14%, 15%, 17%,

28% and 37%. Of the five mostly career departments, percentages identified were; 16%,

24%, 24%, 26% and 29%. The remaining thirteen career departments identified a low of

3% to a high of 45%. Specific identified percentages were 3%, 7%, 10%, 14%, 23%,

24%, 30%, 32%, 32%, 37%, 38%, 44% and 45%. This compared to twenty-nine percent

false alarms for the Appleton Fire Department.

Question five was designed to determine the method in which departments

responded to false alarms. The question provided for three responses using emergency

response meaning lights and sirens and non-emergency response equaling no lights and

sirens as the qualifiers for the question. Eleven departments identified that they respond

to activated fire alarms with all responding apparatus in the emergency mode. Eleven

departments identified that the primary unit responds in an emergency mode with other

units responding in a non-emergency mode. One department identified that units respond

in a non-emergency mode and one department did not respond to this question. The

purpose for this question was to gather information as it related to response practices and

the research question relating to making department changes to reduce the risk to citizens and firefighters.

Question six was written to identify the resources used to respond to activated fire alarms. Again, to use the information to gather information as it related to response practices and the research question relating to making department changes to reduce the risk to citizens and firefighters. Two departments identified that they send a single piece of equipment to an activated alarm. Four departments identified that they send two pieces to an activated alarm. Four departments identified that they send three pieces of equipment to alarms. Five departments identified that they send four pieces of equipment to alarms. Three departments identified that they send five pieces of equipment to alarms and six departments identified that they send in excess of five pieces of equipment to alarms. This compares to the current practice of the Appleton Fire Department sending four pieces of equipment to activated alarms.

Question Seven was written to ascertain methods being used to reduce false alarms by departments. The question asked if departments used billing, registration or education as programs to reduce false fire alarms. Fifteen departments identified that they use billing as a means to reduce false alarms. Fourteen bill the owner and one bills the occupant. Three departments identified that they have an alarm company registration program. Two departments registered the alarm and monitoring agency and one department registers alarm installers. Three departments identified that they utilize education as a means for reducing false alarms. Three identified that they educate occupants, and two identified that they educate owners.

Question eight was used to identify perceptions on the causes of false alarms. Five examples were provided for the purpose of rating what caused the most false alarms within their community. The five were 1. Pull station activation, 2. Burnt food, 3. Construction work, 4. Alarm technician failed to notify alarm company of work, 5. Owner occupant failed to notify alarm company during testing. Burnt food was chosen as the number one cause of false alarms by eleven responding departments. The second highest cause was alarm technicians failing to notify the alarm company of their work. The third highest was owners failing to notify the alarm company of their testing. The forth highest was during construction and the fifth was activated pull stations. This information was gathered to assist in the answering of research questions relating to the cause of alarms.

A number of shortcomings were identified with the survey tool. The 24% return of the survey tool was too low to provide a complete picture as it related to the questions asked. In addition, the survey should have been sent out to a greater number of participating departments to provide a more significant number of surveys to use for gathering information for the research. One hundred responses would have been more appropriate to use in a survey tool. Additionally, it would have been more beneficial to utilize the USFA Fire Department census to identify departments of equal size and makeup. By surveying these departments of equal size, the survey tool should be more accurate. Question eight would have been more useful if it was asked in a manner that more accurately identified types of alarms in relation to the NFIRS codes and specifically comparing human versus system in nature. This would have provided a clearer picture as to the root causes of alarms. As asked, it was more directed at gathering opinion versus

facts and as a result could not be compared with actual data identified in the review of the 370 false alarms incidents in 2007.

In attempting to answer the question relating to changes the department could make to reduce the risk to citizens and firefighters, the topic of false alarms was discussed at the July 16, 2008 and August 20, 2008 department chief officer staff meeting. During this meeting Chief Cameron's July 10, 2008 memo (Appendix A) was discussed with chief officers in attendance. During this discussion Battalion Chief William Breager raised a concern relating to any reduction in response to alarms by the department. His concern generated around the risk of exposing department personnel to an actual fire with limited resources. He communicated that he understood the statistical data that a large portion of activated alarms were false; however, he stated that he could not support the reduction of resources.

Battalion Chief Darrel Baker stated that he could see a need to adjust the current department practice relating to fire alarm response based on the information provided by the chief as it related to the number of fire alarms that were false. In addition, Baker identified that his recollection was that on every occasion that he was dispatched to an activated fire alarm, which turned out to be an actual fire, notification or confirmation of the actual fire was received by the communication center prior to fire department arrival. This led him to believe that activated alarms, which were actual fires would generate additional calls allowing for the upgrade in response to a full structure fire response in a timely fashion. He stated that this is a risk/benefit decision and understood the accepted risk based on department data relating to the number of alarms that turned out to be false.

Deputy Chief Bruce Hannigan cautioned the members of staff that a reduction in response to activated alarms could create a atmosphere of complacency as it relates to these types of incidents, and that this complacency could lead to an increase potential of delayed response to incidents in buildings with alarm systems potentially increasing the risk to occupants as well as firefighters.

As a result of the discussions at the staff meeting, a decision was made to develop a draft proposal relating to altering the response to activated alarms for the purpose of gathering additional information on the topic. Based on information gathered as part of this research, a draft standard operating guideline was presented to company and acting officers within the department for input (Appendix I). The draft standard operating guideline created different response parameters for normal and high hazard occupancies. The response for normal hazard occupancies was changed from the traditional two engine companies, one ladder company and an incident commander with the primary unit responding emergency, to a single engine company and an incident commander responding non-emergency. The response to high hazard occupancies remained the same with two engine companies, one ladder company and an incident commander responding, the primary unit responding emergency and the other units responding non-emergency.

The draft guideline was emailed to all company and acting officers seeking their input into making changes to the response parameters for false alarms. Along with the draft guideline, background materials were provided identifying the history of false fire alarm response for the department, and that the staff was contemplating altering these responses based on historical data relating to activated alarm systems and false alarms.

The company officers were asked to provide information into the proposal as it related to the following items:

1. Hazard Definitions. What are your thoughts on the proposed Normal and High Hazard occupancies types? Do they capture the right kinds of buildings, do they address response issues?

2. Specific Building Concerns: Do you have ideas regarding specific building types or specific buildings that you feel would fall into one of the above definitions? Once identified, these buildings would be programmed into the computer aided dispatching (CAD) system for specific unit response based on type of building.

3. Input on the proposed response parameters: What are your thoughts on apparatus assignments and response methods?

4. Specific questions relating to the overall proposal or false fire alarm reduction initiative: Is there something we are missing?

This request for information was sent out to thirty-one officers or acting officers. They were given two weeks to submit their response for review. Nine officers or twenty-nine percent of those questioned responded to the request for information. The majority of the officers who responded did not direct their response specifically to the questions but in general provided input into the overall concept of changing the response concept.

Captain.. Shannon Young suggested that any apartment building over eight units be considered a high hazard, due to evacuation concerns. She suggested that specifically identified problem buildings and buildings with high occupant load be categorized as high hazard even though they met some of the built-in fire protection standards that would classify them as a normal hazard occupancy. Her overall concern is that our

firefighters would become complacent in responding to active fire alarms under the proposed change.

Lieutenant Mike Woodzicka, president of the firefighters union, stated we should keep the current response plan. Most of the time, the second and third-in units are cleared from the scene either en route or shortly after arriving on scene, but at least they are there in case they are needed. The rig that usually spends the most amount of time on scene is the first in unit and the new policy does nothing to address the problem of waiting an hour for a key holder to respond and help gain entry or reset the alarm system. Some of the large buildings are difficult to investigate with one crew because of their size. Also managing the people on site can be difficult with one crew because they're looking for the source of the alarm. A second crew usually takes care of this function. Additionally, if the first-in crew needs equipment brought in or other support, additional crews do this. The new policy has schools, residential buildings, and other properties that are not always protected by automatic sprinkler systems listed as a normal occupancy type. Woodzicka felt the only buildings that are included, as normal occupancy should have full sprinkler coverage. Responding to any building that is not fully sprinklered with one engine crew is a bad idea. If you do discover a problem at the scene, the delay in dispatching additional units will prove to be costly, as we know time is critical in these first minutes of a scene. He understood that many, if not most of the time, these calls turn out to be of no real significant risk, but the department should respond as if they could be. He suggests keeping the policy the way it is and let the incident commander use discretion on what apparatus he lets continue to respond. If it is one of our "frequent flyers" or a

building we know fairly well, the incident commander can choose to send only one engine.

Lieutenant Joe Scott stated that his only concern would be at night when we respond to large facilities; sometimes it takes more then one crew to find the problem or run into the building representative.

Acting Officer Chris Fischer responded that historically, in response to millions of fire alarms across the country, the best practice of a first alarm response that includes a shift commander, two engines and a ladder truck has evolved to the point it is today. This type of response is taught in every fire-based education program, and is accepted as the standard operating practice. He found it difficult to believe that our fire department is unique enough to tread on its own path and move away from time-tested standard practices in the fire service. In fact, he felt that our annual incident data both reflects and mirrors trends that are seen nationally in terms of the types of incidents we respond to. In taking all of the evidence together, it elucidates the need to keep the amount of resources responding to these types of incidents the same as our standard operating guideline currently reflect. One of the causative points for change that was addressed in the initial correspondence was the need to reduce department impact. Based on our mission of protecting and serving based on response (among other attributes), this statement and the actions of the change appear to directly contradict our mission statement. He stated that when an alarm is registered, whether through an automated system that has activated due to a fire, or to a child who accidentally pulled a fire alarm station, the most important number and fact that needs to be reiterated is absent: 100% of these are alarms. We find out what alarm nature is after our initial investigation. In

looking at the overall picture, the response measures we take and what happens after the initial response on scene are two separate points that need to be split and addressed. Chris stated he did not get a feel for this in the presented proposal. He stated in his experience, the impact on the resources utilized for alarms gets 'bogged-down' during the 'investigation phase' of the operation and not on the initial 'response phase'. In terms of time commitment, the eight to ten minutes to get on scene for an ancillary support (e.g. not primary) unit is completely different than waiting on scene two hours to be cleared. Specific building concerns and hazard definitions are points that could be addressed in these investigation procedures or guidelines and not take away from initial complement of resources that respond to these calls.   He continued with the uncertainty and unknown variables that all incidents carry, a reduction of the initial resources, in my opinion, is not a good solution. With no other information, all calls should be considered emergency until identified otherwise.

Captain Jay Thomas stated, we do need a multi-pronged approach to reducing, and ideally, eliminating false alarms. To reduce our alarm response, however, should not be a component of the approach. This is a change in basic philosophy that presumes there is no need for our intervention. It will breed complacency, placing citizens and firefighters at greater risk if indeed there is an emergency. Life loss and fire loss is low in our community. One critical contributing factor to this is response time. He felt keeping time on our side by continuing to respond under our current protocol.

Acting Officer Doug Vrechek responded that he wrestles with the fact that he may be biased or closed-minded in his view of this response proposal. He stated he does not support the change and would like to see the response protocols remain the same. He did

add that if the change proceeds, he included in the hazard occupancy protocol, all

buildings with pre-engineered structural components (EG: TGI's, floor trusses, roof

trusses). It seems that this type of construction was allowed, based on the development

of alarm systems. He continued that all buildings that are not fully protected by an

automatic fire sprinkler system should be classified as high hazard and be responded to in

the current format. He recommended that buildings that pose communications issues such

as large buildings with dead spots or buildings with sub-grade areas remain in the

existing protocol. He stated as a person who rides the units to these alarms, he struggles

with tying to remember an instance that resources responding to alarms, other than the

first-in unit, were tied up on what resulted in a false alarm He felt that even though these

units are assigned to the fire alarm call, they are available at the scene. Oshkosh Fire

Department has recently adopted a new response criterion for fire alarms. They have

omitted one engine and now respond with an engine, quint, and a shift commander.

Perhaps a gradual trial may be more appropriate. Finally, he recommends that protocol

remains the same and that a greater leeway be given for the shift commanders to make a

case-by-case judgment call based on their experience and the conditions that apply to that

specific alarm assignment. Every call is different, in the information given, the time of

day, the occupancy, the weather, etc. The shift commander is just that, the leader of the

shift, able to make critical judgment calls based on the specific situations. Trust in their

abilities and allow this leeway.

 Lieutenant Paul Steel responded that operating with the presumption that alarms

received are false, not only sets a bad precedent for the department, but also goes against

every other operational practice that we have. Alarm systems have been installed in the

City of Appleton, due to the mandate of various codes rather than by the choice of the building owners. These building owners have spent considerable sums of money to have systems in place to alert the fire department of potential fires in their buildings. They should be confident that by investing in a system, should the alarm be activated, they will receive a response from the department, commensurate with the hazard being reported; a fire. The department has strived to improve response times. This has included investing millions of dollars in new stations. In addition, our neighbors are involved in a public debate over hiring full-time firefighters to improve response times. It is not the time to capitulate, and accept non-emergency responses in lieu of improved response times. Many standard guidelines have been adopted over the years based on the pretence that alarms are fires. We attempted to have engines hook fire department connections at alarms, under the presumption that there could be a fire. More recently, we adopted a high-rise policy that requires the first-in crew to take in a full complement of equipment, including two high-rise packs, to alarms. How many films have we watched in training over the years showing how fires grow rapidly? By delaying the first in rig with a non-emergency response, we could have a fire that could be controlled with an extinguisher, become an out of control inferno. What good does it do the citizens of Appleton to save money on fuel, and time of their firefighters, and forfeit the life of one of their neighbors? This change will someday cost a life; civilian or firefighter.

Captain Mark Evel stated, "Cutting our response on a first alarm assignment to fire alarms is just an accident waiting to happen due to lack of staffing first-in on a scene. In my opinion the better way would be to leave the response under the current format and

place a little trust in our shift commanders and officers to make a decision as to when and

or how we respond to any given call depending on information given."

As a result of the presentation of the draft standard operating guideline to

company and acting officers proposing a reduction in response capabilities to

activated fire alarms, International Association of Firefighter Local 257, submitted an

official objection to Chief Cameron relating to the fire alarm response proposal.

President Mike Woodzicka wrote, "The Appleton Fire Fighters, Local 257 objects to

the changes as proposed in the Fire Alarm Response Proposal. We believe that

changing the response to that outlined in the proposal is a safety concern for our

members. As a rule, fire doubles in size every minute. Fire growth- the rate of spread

and the intensity of the fire- is directly linked to the time it takes to initiate fire

suppression operations. The rapid response of an appropriate number of firefighters is

therefore essential to initiating effective fire suppression and rescue operations that

seek to minimize flame spread and maximize the odds of preserving both life and

property. Any decrease in emergency unit response capabilities correlates directly

with an increase in expected life, property, and economic losses. Therefore, it is

important to send adequate resources to any potential fire alarm. Units responding

may often be cleared from the scene either en route or shortly after arriving on scene,

but at least they are there in case they are needed. I understand that many, if not most

of the time, these calls turn out to be of no real significant risk, but we should respond

as if they could be. With that being said, we all know that there are certain properties

that require us to respond on a more frequent basis. Rather than rewriting the entire

fire alarm response policy, give the Battalion Chiefs the discretion to alter the

response to these buildings. There are far too many variables with creating a blanket policy to cover all types of occupancies. We should not become complacent with responding to fire alarms, because as we know complacency in the fire service can have tragic results."

An interview was conducted with Captain Julie Bahr of the Appleton Police Department as it related to the success and obstacles of the false alarm reduction strategy introduced by the department in 2007. Captain Bahr was asked what steps were taken that you feel made the most significant contribution to the false alarm reduction? She stated, "Most importantly, we have worked with the alarm businesses and asked them to be a part of the solution and to police themselves. They came up with many of the ideas that were implemented and have applied helpful peer pressure to encourage those who were reluctant to participate. The change in the alarm ordinance to require enhanced call verification (EVC) was also necessary." Where they any obstacles that you ran into when making the changes and how did you overcome those obstacles?   Captain Bahr stated "We tried to avoid many of the likely obstacles by involving the alarm businesses as partners in the solution. We also did our homework to do a thorough analysis of the problem and research what others were doing to find a solution. It was a relatively easy sell to the Council to change the ordinance since we preemptively answered their questions and left little to debate. The one obstacle that we currently have that has not yet been resolved is the participation in this initiative by the communications center. If they were to simply ask if ECV procedures were used, before dispatching the alarm to our officers, we could have an even greater reduction. They have thus far been reluctant to do so since this is something "special" that they would have to do just for Appleton

and not for the other agencies they dispatch for. We are continuing to work with them on

this issue." What has been the success of your program? "Beginning the strategy

discussion in 2006, we used 2005 as a baseline. In 2005, we responded to 1025 false

alarms. In 2006 we responded to 909 false alarms equaling an 11% reduction. The new

alarm ordinance took effect in 2007. In 2007, the department responded to 661 false

alarms which was a 35.5% reduction from the original baseline number."

<div align="center">Results</div>

Descriptive research methodology was utilized for the purpose of answering the

following questions in an effort to identify information necessary for the development of

strategies in the reduction of risk to the citizens and firefighters from false fire alarms in

Appleton, Wisconsin.

What percentage of false fire alarms is caused by system malfunction? This

question was researched through the analysis of statistical data of the Appleton Fire

Department for 2007. The purpose of this analysis was to identifying the total number of

alarms caused by system malfunction. In determining these types of alarms, strategies

could be developed to address false alarms caused by system malfunction.

Answering the question relating to system malfunction could not be done through

a direct review of NFIRS statistical data. System malfunction is a category utilized in the

NFIRS situation found classification system as a means to identify causes of alarms,

however, when comparing national statistics gathering methods to local gathering

methods, an additional 37 system-related false alarms were identified from the narratives

of reports identifying the alarm as unknown or unintentional. This was found as a result

of the review of individual narratives identifying the actual cause as system related.

Based on the NFPA Fire Experience Survey, 1988-2006, using NFIRS situation found codes, a steady rise of false alarms caused by system malfunctions was identified between 1988 and 1999. From 1999 until 2006, a reduction has been observed. Nationally, system malfunction accounted for 33.5% of false alarms in 2007. Using the same criteria in evaluating Appleton false alarms, system malfunction would account for 91 alarms. Ninety-one alarms would account for 24.5% of the false alarms in Appleton. However, we know that this is not correct as the actual false alarms caused by system malfunctions based on a review of the report narrative was 128 or 34.5% of the 2007 false alarms. As a result, we may be under reporting system involved false alarms nationally as a result of inconsistent information gathering.

The local alarms identified as system involved but not captured in the system malfunction category were discovered in the unknown or unintentional areas of the statistics. Kitteringham (2008) identified the importance of investigating every alarm closely as it had a direct result on determining the cause of the alarm and creating strategies in reducing that false alarm cause. As Moore (2007) stated that system maintenance is a leading cause of false alarms, properly identifying alarm reasons can improve alarm reduction strategies. Future steps will need to be taken to address the potential inaccuracies in capturing system malfunction type alarms; however, for this question, system involved false alarms have been identified for the City of Appleton in 2007.

What percentage of false fire alarms is caused by human error? This question was researched through the analysis of statistical data of the Appleton Fire Department for

2007. By identifying the total number of alarms caused by human error, strategies could be implemented in the reduction of those alarms.

Answering the question relating to human error could not be done through a direct review of NFIRS statistical data. Human error is not a directly identified statistically gathered type of situation found code. When evaluating alarms locally, it was clear that human involved alarms were categorized in many different NFIRS situational found classification areas. Evaluating local data, it was discovered that many alarms that were directly caused by human error were in a category utilized in the NFIRS situation found classification system as unknown or unintentional. When evaluating the narrative, the alarms were identified as human error type alarms.

A specific example of this was identified in alarms that were caused by the pulling of a manual alarm station. These alarms, although malicious in nature, are identified as human error alarms. A person, not as a result of system malfunction, activated the alarm. When developing strategies, these types of alarms need to be address in the overall reduction of false alarms. Thirty malicious alarms were found within categories listed as unknown or unintentional. Without individually evaluating the narratives of these alarms, the true cause would not be identified. Nationally as well as locally, unintentional alarms account for the highest number of false alarms. It is within this area that the true human error alarms were discovered. In addition, a significantly higher number of false alarms were caused by lack of notification and work being done on alarms. Although these are directly involved as human error, these alarms were also hidden within general categories.

By conducting an individual review of false alarm narratives, the answer to the research question was determined. In the City of Appleton for 2007, 184 false alarms were the direct result of human error.

What steps can be taken to reduce the number of false fire alarms? This question will be researched through an evaluation of literature material available on the topic. Additionally, information was gathered through a survey of other fire departments and interviews with the Appleton Police Department relating to the false alarm reduction program implemented in 2007.

Duggan (2007, p.38-48) identified that reductions in false alarms caused by system malfunction is directly related to the proper care, maintenance, and inspections of alarm systems. He explained the concept of system malfunction as a bathtub effect. When systems are installed, there is a higher probability of false alarms as a result of damage and defects of system components. He called this the burn in period. The failure rate becomes much lower as a result of system components functioning during their normal lifetime. Alarms during this period are considered chance alarms. As components reach the end of their lifetime, the false alarm frequency again increases when wear out failures occur. Having an aggressive inspection and prevention program will assist in the reduction of alarms caused by system malfunction.

Kitteringham (2008) stressed the importance of investigating the cause of every false alarm. He found that many false alarms were being classified as unknown or unintentional and, as a result, the exact cause was not identified and strategies to address the causes could not be developed. Using multiple strategies, he found that false alarms could be significantly reduced. He reported that Brookfield Properties had a 50%

reduction in false alarms through the implementation of training programs for employees and tenants, requiring workers to obtain permission before working on any system components, and passing on false alarm fees charged by the fire department to the individuals responsible for the false alarm.

Moore (2002) listed the importance of system designers in the overall reduction of false alarms. He recognized that alarms must be properly installed, maintained, and cleaned to reduce false alarms. These components had to be managed continually to maintain control on false alarms. His recommendation was to use funds saved through the reduction of false alarms for the purpose of adding funding to fire prevention staff. He also recognized the importance of qualified technicians on the reduction of false alarms through proper maintenance and reduction of alarms caused as a result of work being conducted on system without proper notification.

The City of Roanoke, Virginia found that an alarm registration program provided them with information relating to system maintenance and allowed for the reduction of fire alarms by providing training materials to alarm owners before false alarms occurred. Minneapolis (2008, p.12) identified a two-tiered approach to reducing false alarms, educations and enforcement. They determined that educating occupants and owners would result in false alarm reduction. Secondly, they are considering the implementation of the Underwriters Laboratory Fire Alarm Certification Program, which would require owners to meet standards in regards to installation, maintenance and response to alarms.

Dove (2008, p.6-8) recommends that fire departments be proactive in the management of false alarms by promoting greater customer service to alarm owners,

stressing the importance of training, and conducting maintenance in accordance with nationally recognized standards as a means of reducing false fire alarms.

Through the survey tool used to gather information from other fire departments, it was determined that departments frequently use billing for responses to false alarms as a means of reducing false alarms. Sixty-two percent of the departments surveyed identified the use of a billing process for false alarms. One hundred percent of the departments responding confirmed that they direct billing for the false alarms to the property owner. In addition, one of the responding departments also identified that they bill occupants also. It was discovered with the survey tool that fewer departments used alarm registration and formal education programs as a strategy for false alarm reduction. The survey identified that less then 13% of the responders use either of these programs as a strategy for false alarm reduction.

Fire Protection Handbook (2003, p.7-36) cautions that billing strategies must be closely monitored to prevent the possibility of alarm monitoring being disconnected in an event to reduce false alarm charges.

Captain Julie Bahr identified the importance with working with the local alarm companies as a means of reducing false alarms. She identified that the alarms companies identified many of the strategies that were used in their alarm reduction program. She also found that the alarm companies applied helpful peer pressure in encouraging other companies to participate in false alarm reduction strategies. One component of their strategy was the ability to incorporate enhanced call verification. This reduction strategy allowed for calls to be made directly to the effected property before units were dispatched.

What department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms? This question will be researched through the use of analysis of materials gathered through literature review, surveys and internal discussions with department members.

Numerous articles were reviewed identifying the risk to firefighters as a result of responding to and returning from calls for service. Fatalities caused by responding to and returning from calls is the second leading cause for deaths among firefighters. Reducing the number of alarms that the department responded to would decrease the risk to firefighters as a result of the dangers in response. In reducing apparatus responding, this also reduces the same risk to citizens as a result of collisions involving apparatus responding to false alarms.

Reducing the number of apparatus responding to fire alarms will also reduce this risk relating to response to and return from alarms, however a strong position was taken by department members that the reduction of response resources to fire alarms adds additional risk to firefighter when the alarm is determined to be an actual fire situation. Coleman (1997, p.353-354) identified that departments do calculate risk and reduce alarm resources based on the high percentage of alarms being false. Klaene and Sanders (2000, p.238-239) caution that reducing the response to false alarms can create an atmosphere of apathy and lulls firefighters into complacency. Reducing resources to alarms can have disastrous outcomes.

Looking for response protocols for responding to activated fire alarms, no specific literature could be found outlining equipment response recommendations. NFPA 1710 (2001, p.1710-8) identifies response standards for initial full alarm assignments based on

the tasks that need to be performed. The standard identifies a minimum of fourteen firefighters on the scene for interior structural firefighting. Although this standard does not address fire alarm response, the perception would be that this response would provide the necessary forces in the event the alarm was an actual fire.

The Fire Protection Handbook (2003, p.7-180) provides response recommendations based on occupancy type, classifying high, medium, and low hazard occupancies. Based on the classification of the building, the recommendation would be from a minimum sixteen for a low hazard to a maximum of 26 firefighters for high hazard occupancy. Under the current response parameters of the department, eleven firefighters are dispatched to fire alarms.

As a result of a proposed change in the false alarm response protocol, Local 257 of the International Association of Firefighters, representing the Appleton firefighters has gone on record as opposing the reduction of resources to alarm activations, considering this a safety issue for responding firefighters. The concern relates to the lack of needed resources in the event the alarm is determined as an actual fire. In addition they identified that the delay in additional unit arrival will allow the fire to increase greatly increasing the hazards to firefighters.

Based on survey question five, eleven responders (46%) identified that they respond to fire alarms with all apparatus in an emergency mode. Emergency mode was identified as responding with lights and siren. An equal amount, (46%) identified that they respond with the primary responding vehicle in emergency mode and subsequent vehicles in non-emergency mode or by rules of the road. Only one responder identified that all apparatus responds non-emergency to fire alarms. The results of the survey do not

support the practice of responding with all resources to fire alarms in a non-emergency

mode or by rules of the road.

In a review of the false alarms response for 2007, it was discovered that on 53

occasions, department resources were on an alarm when a subsequent call for service was

received. Many of these calls were emergency medical calls. By reducing the number of

alarms and the number of units dispatched to alarms, resources may be available to

respond to other emergencies reducing the risk to citizens as well.

Discussion

False fire alarms have accounted for twenty to twenty-seven percent of the non-

medical calls for service of the Appleton Fire Department from 1997-2006. This trend is

consistent to the national statistics identified for the same period for other fire

departments (NFPA 2008). As the department is asked to do more and budgets become

tighter as a result of the fiscal constraints being placed on all communities, fire service

professionals will be challenged to look at ways of reducing service levels and finding

cost savings.

The City of Appleton is continually being challenged by the reduction of funding

sources. As a result, the mayor directed all city department heads to evaluate services and

expenditures and to develop contingency plans for the reduction of individual budgets by

twenty percent. During this process, Chief Neil Cameron (2008) identified the impact of

false alarms on the resources of the department and challenged the department staff to

look at strategies for the reduction of false fire alarms. As a result of this request, a

problem statement was developed for the purpose of researching this issue. The problem

is that strategies to reduce the risk to citizens and firefighters from false fire alarms have

not been identified in Appleton, Wisconsin. The purpose is to identify strategies to reduce the risk to citizens and firefighters from false alarms in Appleton, Wisconsin. By addressing the problem, the department and city could potentially see a costs savings by the reduction of resources needed in responding to false alarms.

To address the problem, a number of research questions were developed for the purpose of gathering information;

1. What percentage of false fire alarms is caused by system malfunction?

2. What percentage of false fire alarms is caused by human error?

3. What steps can be taken to reduce the number of false fire alarms?

4. What department changes can be made to reduce the risk to citizens and firefighters as a result of false fire alarms?

To address the questions, a review needed to be completed on false alarm incidents of the department to identify root causes of false alarms. The department captures incident information using the National Fire Incident Reporting System (NFIRS). In reviewing the information captured from company officers completing the NFIRS incident reports, it was quickly identified that the information being captured in statistical format was not consistent or accurate in many cases. NFIRS (2008) utilizes situation found codes for the purpose of identifying false alarm types. These codes are broken down into a number of major headings and further subdivided based on more specific information gathered. However, the statistical breakdown does not capture specifically the system malfunctions and the human error causes as was identified as a need in the research.

The NFIRS system captures data using malicious/mischievous, system malfunction, unintentional call, and other false alarms as the major category. In reviewing nationally gathered data from NFPA (2008), it was apparent that the largest category captured was unintentional calls. As part of the research to answer questions one and two, I had to conduct an individual review of the narratives within the incident reports. This would not be typical in the capturing of data for statistical review. In reviewing these reports, it was quickly discovered that many alarms were mistakenly classified or listed as unintentional when they clearly fell within other false alarm types. This concerned me as in comparing local statistics to national statistics, I could see a flaw in the capturing of data that could make it harder to identify the root causes in which strategies could then be developed to address these root causes.

As a result of this concern, I identified the need to develop training for department members on the importance of properly classifying the cause of the false alarm. I also identified the potential for capturing additional information at the time the incident report is completed as a means for developing strategies to reduce false alarms.

By reviewing individual narratives and situation found codes, I was able to identify that in Appleton, Wisconsin, 34.5% of the false alarms were caused by system malfunctions. Fifty percent of the alarms were caused by human involvement, and 16% were listed as unknown. By identifying the causes of false alarms, the department could then build strategies to address these causes.

In looking at strategies for the reduction of false alarms a literature review was conducted. In this review, I discovered many concepts that would be beneficial for the department to implement for addressing the overall problem of reducing false alarms. I

realized the importance of fully investigating the causes of false alarms. Kitteringham (2008) clearly stressed the importance of thorough investigation as a means of determining the root cause of the alarm. When they initiated their false alarm reduction program as property managers for Brookfield Properties, they quickly identified the cause of a large number of false alarms being listed as unknown. When an alarm cause is unknown, you can't identify strategies to address them. By in-depth investigation into the alarm cause, Kitteringham was able to reduce the large number of false alarms listed as unknown. This provided them with the exact cause of the alarm in which strategies could be developed to address the cause.

Training was identified as a key component in the reduction strategies for false alarms. Kitteringham (2008) found that training both staff members as well as occupants significantly improved the reduction of false alarms. Moore (2007) also identified the importance of properly trained alarm technicians, as this was a means for reducing false alarms caused by system malfunctions and notification errors. The City of Minneapolis (2008) identified their primary strategy for the reduction of false alarms as education. They specifically identified that the education needed to be directed at occupants as a strategy. The Fire Protection Handbook (2003, p.7-36) also identified the importance of training building staff as a means of reducing false alarms.

As a department, we have stressed the importance of installation of alarms. During routine inspections, we look for records on the inspection of alarms; however, we have not taken steps in developing comprehensive education programs as a means for reducing false fire alarms. Clearly, this would be an area that the department could take steps in as a means of reducing alarms.

Another important discovery was the number of experts identifying the need for addressing alarm designers, installers, and maintenance workers. Systems not properly maintained tend to increase false alarms. Duggan (2007, p.38-48) identified failure rates of new systems and components and stressed the importance of maintenance to prevent the chance alarms as well as the wear out failures as systems become older. Moore (2007) identified the same concepts as strategies for the reduction of alarms. Dove (2008, p.6-8) stressed the importance of using model codes for outlining the proper procedures in addressing the installation, maintenance, and testing of alarms systems as a strategy for the reduction of false alarms.

As a department, we have a heavy involvement in the installation of alarm systems. We require that department personnel review the design of fire alarm systems before installation. We observe the acceptance testing of alarm systems before they are approved for use; however, we tend not to be involved in the system once the acceptance testing is completed. Follow-up on false alarms caused by system malfunction is rare. Typically, follow-up occurs only after the department has responded to many false alarms and the system is highlighted to the prevention division as a result of complaints from responding crews on the number of times we have responded to the building.

If we followed up on all system malfunction alarms, recommendations could be made in the early stages that would have prevented the multiple alarms that were received at the business prior to them becoming what an officer would call a "frequent flyer." This follow-up could cause an initial increase in staff time; however, the reduction in staff time for the continued alarm response could be significant.

Since 2006, the Appleton, Wisconsin Police Department has implemented strategies for the reduction of false alarms. These strategies included false alarm fees, enhanced call verification, working closely with alarm companies, alarm company registration and discontinuance of response to frequent flyers. In speaking with Captain Julie Bahr, she identified a 27% reduction in alarms in 2007. She identified since the beginning of their implementation of reduction strategies, they have experienced an overall 35.5% reduction in false alarms. In evaluating their strategies, I believe many of them can be utilized by the fire department in developing strategies for the reduction of false alarm; however, I would not support the provision of call verification prior to dispatching units as a strategy for the fire department as this has the potential of creating significant delays in response and could be disastrous. The difference between security alarms and fire alarms is that security alarms are typically voluntarily installed, where fire alarms are mandated for installation.

The City of Roanoke, Virginia identified the importance of inspection, routine maintenance and proper notification of work before commencement on alarm systems in their alarm registration program. In evaluating this material, it was identified that a significant benefit towards the reduction of false alarms could be system and company registration. By registering alarms systems, the department could utilize this information for the purpose of directing educational material to owners and occupants on alarm system functionality and false alarm reduction strategies. People may believe that this could be accomplished during the required inspection of the building; however, I believe that the emphasis on the false alarm reduction strategy would be lost if added to the components of building inspections. In addition, registering alarm technicians may be a

means for increasing their knowledge on system needs and false alarm reduction. More importantly, it may be a means of eliminating the false alarms caused by technicians when working on alarms without notification.

The department must use caution as to the implementation of any program as this could be seem be staff as another effort for increasing programs in a time of reduced funding. Any program must be evaluated for the benefit and cost and must demonstrate that the cost of the program both fiscally as well in employee time is offset by the reduction in staff time and resources responding to false alarms.

The last question deals with reducing the risks to citizens and firefighters as a result of false alarms. The most significant risk is associated with responding to and returning from false alarms. United States Fire Administration (2006, 2008) identifies responding to and returning from as the second leading cause for firefighter fatalities in the fire service. Each provided specific examples as the fatalities related directly to false alarm responses. There are a number of strategies that can be introduced as a means of reducing this risk. The first would be the overall reduction in the number of false alarms that the department responds to. Previous discussion addresses some of the potential strategies for reducing the number of alarms. Secondly, the department could alter the methods in which we respond to enhance response safety. Currently, we respond with the primary unit in emergency mode, lights and sirens, the subsequent units respond non-emergency. We could change department guidelines and have all units respond non-emergency. This would reduce the exposure to firefighters and citizens as a result of the inherent risks associated with emergency response. Thirdly, we could reduce the overall number of units responding to alarms, as this would reduce the exposure to firefighters

and citizens from multiple units responding as well as leaving more units available for response within their districts for subsequent calls for service. It was identified in the research that fourteen percent of the time when units are on a false alarm, the department received a subsequent call. Each of these strategies has benefits and could be seen as a reduction of the risk to firefighters and citizens.

In proposing a draft concept for altering response protocols, it was quickly identified that department company officers and some chief staff members were not supportive of this reduction. Although they saw that the frequency of false alarm was high, their concern was for those occasions when the alarm was a significant incident and the delay in obtaining additional resource actually increased the risk to firefighters. The response risk was outweighed by the risk associated with delays in having adequate resources on the scene in a timely fashion. It should be noted that the draft proposal was developed based on the far end of the spectrum, moving from four pieces of apparatus with one responding emergency to one piece of apparatus responding non-emergency. Staffing resources for an alarm assignment went from a minimum ten firefighters to three firefighters in the proposal. Although the draft proposal significantly reduced resources to respond to alarms, I believe that using the occupancy based hazard concept within the proposal can be beneficial as we look at a middle ground in developing alternate response strategies to alarms with some reduction of resources based on features and size of the building being responded to. Based on the draft proposal, the International Association of Firefighter Local 257, the union representing Appleton firefighters has gone on record not supporting a change, based on safety concern over the alteration to the staffing assignments for response to active alarms.

In the survey sent out to other departments, it was identified that the tiered response approach, a combination of emergency and non-emergency has been accepted by over 50% of the departments that responded. The strategy of non-emergency response by responding units to alarms was not well adopted by those that responded. Only one department responded to alarms with all units going non-emergency.

Klaene and Sanders (2000, p.238-239) caution on altering response protocols as it causes apathy and lulls firefighters into complacency, which could be disastrous. I somewhat agree with their position, however, I believe we have already reached this level based on the shear number of false alarms. To address this complacency, the department needs to address the overall reduction of the number of false alarm occurrences along with a balanced approach to reducing some of the resources currently committed to alarm responses.

From the survey and literature, it was identified that the key strategy used by fire departments in the reduction of false alarms is false alarm billing. The Appleton Fire Department has used this strategy since the late 1980's. Although this is a successful strategy, I believe that this strategy does not address the true cause of the false alarm and could be more effective if modified. In the survey, 62.5% of the departments use false alarm billing as a reduction strategy. Of those departments, all direct the billing towards the property owner. One department also directed billing to occupants. Kitteringham (2008) identified the success at passing these fees on to the workers or tenants who caused the alarm. I believe that this would be very beneficial as a strategy in reducing alarms caused by the same individual multiple times. Specifically I see this as a reduction strategy addressing the alarms caused by the lack of notification when

contractors/maintenance personnel are working which accounted for 12% of the human error false alarms in the City of Appleton in 2007.

I believe that the utilization of the theory discussed in "Solution 2000" (1999), in addressing the development of strategies using the concept of the three "E's"; Engineering, Education, and Enforcement, the department can address the problem of identifying strategies to reduce the risk to citizens and firefighters as the result of false fire alarms and to address the fiscal and resource impact caused by those alarms.

Recommendations

Identifying strategies to reduce the risk to citizens and firefighters from false fire alarms in Appleton, Wisconsin was the purpose of this research. The following recommendations are being presented as a means to reduce the risk to citizens and firefighters from false fire alarms in Appleton, Wisconsin.

These recommendations will be presented in a manner using the theories described in the "Solution 2000" (1999) report presented in the "Leading Community Risk Reduction" class at the National Fire Academy. These theories stressed the importance of using strategies relating to Engineering; Education, and Enforcement.

Engineering

- The Appleton Fire Department should enhance the current practice requiring that all fire alarm system installations, modification and replacement be reviewed by the fire department for compliance with the nationally recognized standards. Evaluating the possibility of implementing the Underwriters Laboratories (U/L) Alarm Certification Program.

- The Appleton Fire Department should modify the current fire records management system in a manner that will allow the capturing of additional sub-categories of false alarm causes reducing the need for narrative review for false alarm cause determination.

- The Appleton Fire Department should develop and implement a program directed at company officers outlining the procedures for false alarm system cause investigation and documentation.

- The Appleton Fire Department, working with company officers, should modify existing department guidelines outlining the response of resources to fire alarms. These modifications should take into account an evaluation of the hazards associated with the occupancy. The modifications should be based on a tiered approach with one primary piece of equipment responding emergency and other equipment responding non-emergency. This guideline should be based on an acceptable reduction in responding resources based on the hazards associated to life and property of the occupancy. This requirement should not involve the use of enhanced call verification that could result in a delay of alarms being transmitted to the department.

Education

- The Appleton Fire Department should develop fire alarm system training materials to be presented to all property owners upon certification of the installation of all new fire alarm systems.

- The Appleton Fire Department should develop fire alarm system training materials that can be presented to occupants of buildings having a fire alarm system installed.

- The Appleton Fire Department should develop training for fire department employees of the proper process for conducting a thorough investigation into the cause of false alarm and the proper documentation in accordance with the additional procedures developed under engineering recommendations.

- The Appleton Fire Department should sponsor annually one training session for alarm service technicians identified as employees of alarm businesses registered under the enforcement recommendations.

Enforcement

- The Appleton Fire Department should update the current false alarm ordinance to implement provisions allowing for the billing of false alarms to the responsible party in addition to the current practice of billing to property owners.

- The Appleton Fire Department should institute an alarm system registration program, requiring all public occupancies with an installed fire alarm system and alarm service companies to be registered annually.

- The Appleton Fire Department should implement a program that any identified "frequent flyers", those businesses having more than three human error false alarms within a one-year period or those businesses have more than two system malfunction alarms within a twelve-month

period, will be visited by a fire prevention staff member for the purpose of

developing an individual strategy for the reduction of false alarms.

With the implementation of the above listed education recommendations, the

Appleton Fire Department will take steps in reducing false alarms as a result of a lack of

knowledge of alarm system operation and false alarm reduction strategies. In addition,

education on the importance of thorough false alarm investigations will be provided. The

above-mentioned recommendations will provide for an increased emphasis on training

building owners, occupants, alarm system technicians and company officers on the

importance of strategies in reducing false fire alarms. Sponsoring annual training for

alarm company technicians will help build a partnership to encourage peer support in

promoting false alarm reduction strategies. All of these components were identified as a

high priority from the research information evaluated.

The recommendations relating to engineering strategies will enhance the overall

installation, maintenance, testing and repair of fire alarm systems. In addition, it will

address the safety concerns relating to the responding to and returning from alarms by

developing alternative response guidelines based on occupancy hazards and false alarm

history. Any changes in response guidelines should not be created in a manner that would

promote delays in the transmission of alarms.

The recommendations for enforcement would assist in placing the burden of the

false alarm costs on the responsible party versus always on the property owner.

Contractors and tenants have no deterrent for causing multiple false alarms, as there is

currently no ability to charge the individual responsible for the false alarm. Implementing

this type of program should help reduce multiple false alarm events. Development of a

"frequent flyer" program will assist in addressing multiple false alarm properties

providing for a means to develop individual false alarm reduction strategies for those

properties having multiple false alarms.

Hopefully with the implementation of the above recommendations, the City of

Appleton will see an overall reduction in false alarms and a reduction in risk to citizens

and firefighters.

References

Dove, Paul L (2008). "*What are Fire Department Responsibilities? Combination Residential Security & Fire Alarm Systems*" Fire Marshals Quarterly Summer 2008, 6-8.

City of Roanoke (2008). Alarm Registration Program [Electronic version}retrieved October 2, 2008 from http://www.roanokeva.gov/WebMgmt/ywbase61b.nsf/ VwContentByKey/N25Y2JB8007JF

Coleman, John (Skip) (1997), *"Incident management for the Street-Smart Fire Officer"* Fire Engineering, 353-354.

Dungan, Kenneth W (2007), *"Reliability of Fire Alarms Systems"* Fire Protection Engineering Winter 2007, 38-48.

Fahy, Rita, LeBlanc, Paul, Molis, Joseph (2007) *"Firefighter fatalities in the United States – 2007"* National Fire Protection Association (June 2007) 12, 18.

FEMA (2008) National Fire Incident Reporting System 5.0 2008. (3-26) – (3-27)

Fox Cities of Wisconsin Visitor and Convention Bureau (2008) [Electronic version]. Retrieved September 5, 2008, from http://foxcities.org/vi-hist.cfm.

Karter, Jr, Michael J (2008) *"Fire loss in the United States 2007"* National Fire Protection Association (August 2008), 25-26.

Kitteringham, Glen (2007) *"Nuisance Alarms"* NFPA Journal (March/April 2007) [Electronic version] retrieved August 28, 2008 from http://www.nfpa.org/public ournaldetail.asp?catagoryid=1416&itemID=33330&src=NFPAJournal&cookie_e st=1

Klaene, Ben J and Sanders, Russell E (2000), *"Structural Fire Fighting"* National

Fire Protection Association (2000), 238-239.

Minneapolis Fire Department (2008) *"Results Minneapolis)* June 24, 2008, 19.

Moore, Wayne D (2002), *"Living with a Fire Alarm System – Using NFPA 72 helps the

Reliability of the systems you design and install."* NFPA Journal

(January/February 2002) [Electronic version] retrieved August 28, 2008 from

http://www.nfpa.org/catagorylistasp?catagoryID=773&URL=Publications/NFPA

&cookietest=1

Moore, Wayne D (2007), *"Become Part of the Solution, not the Problem"* NFPA Journal

(November/December 2007) [Electronic version] retrieved on September 5, 2008

from http://www.nfpa.org/publicColumn.asp?catagoryID=&itemID=36492&src=

NFPAJournal.

Moore, Wayne D (2008), *"The impact of Training on Fire Alarm System Operational

Reliability"* NFPA Journal (September/October 2008) [Electronic version]

retrieved on September 5, 2008 from http://www.nfpa.org/publiccolumn.asp?

CategoryID=&itemID=40184&src=NFPAJournal.

National Fire Protection Association (2008) *"Fire Department Calls and False Alarms"*

(April 2008)

National Fire Protection Association (NFPA) (2008) *"Fire Loss in the United States –

2007-Full Report"* NFPA (August 2008), 26.

National Fire Protection Association NFPA (2003) *"Fire Protection Handbook"*

Nineteenth Edition Volume 1 (2003) 7-36 and 7-180.

National Fire Protection Association (NFPA) (2001) *"NFPA 1710 Organization*

      And Deployment of Fire Suppression Operations by Career Fire Departments"

      (2001), 1710-8.

Nisja, Jon (2006), *"President's Corner"* Fire Marshals Quarterly (Winter 2006) 3 and 13.

Solutions 2000 (1999) FEMA, September

U.S. Fire Administration (2006) *"Firefighter Fatalities in the United States in 2005"*

      (July 2006),14.

U.S. Fire Administration (2008) *"Firefighter Fatalities in the United States in 2007"*

      (June 2008) 12, 43, 75

Appendix A

Chief Cameron Memorandum

To: Chiefs Staff

From: Neil Cameron, Fire Chief

Date: July 10, 2008

Sub.:   False Alarm Response

Attached you will find various data related to our false alarm experience for 2007 and year to date 2008. I have provided total incidents as well as a breakdown by occupancy. Historically we have reviewed false alarms as a percentage of all calls however I believe a more accurate picture is to look at false alarms as a percentage of non-ems calls. That review indicates that more than 30% of our non-ems calls are false alarms. In order to try and understand what that translates to in terms of operational impact a calculation of on-scene time resulting from these calls has been developed. While it is an approximation of the time impact to the department I believe it gives a good framework within which to consider why we respond the way we do and to serve as a basis for additional code development related to alarm system performance.

There has not been an assessment of causes for the alarms yet or how that ties to performance of monitoring agencies nor do we know if there is a significant proportional change in the number of alarm systems that are now in place compared with prior years. It is also a bit difficult to compare what percentage of calls dispatched as alarms, are actually a true emergency.

One thing is clear at this time as we consistently hear from staff about time constraints (and fuel costs); there is a lot of staff and unit time spent on false alarms. On average in 2007 each false alarm used approximately 90 minutes of unit time and 250 minutes of staff time. Is that time that could be better utilized training, inspecting, maintaining community coverage, etc.? Therefore, I would like you to consider the data and provide feedback on how we can reduce this impact. Should we modify our response to a single unit only and should that unit respond road speed? If so what modifiers would be in place to allow upgraded response? Should (and could) the dispatch protocol be pre-determined by occupancy type – eg: what if we want to send multiple units to a specific hazard group like nursing homes?

From a prevention perspective we are looking at the potential for fees and/or registration of alarm monitoring agencies and installers as a tool to improve quality and performance. If you have other ideas please let DC Hannigan or myself know.

I look forward to your feedback.

Appendix B

City of Appleton False Fire Alarm Code

Sec. 6-20. Fire alarms.

(a) Every public building or place of employment containing either a manual, sprinkler activated or fire detector activated alarm system shall comply with this section.

(b) The Fire Department will be contacted immediately upon activation of an alarm by on-site personnel or a monitoring agency so not to cause a delay in alarm. Any monitoring agency shall be licensed or approved by either Factory Mutual (FM) or Underwriters Laboratories (U.L.).

(c) All systems shall be maintained in operable condition as specified in Chapter 9 of the International Fire Code (IFC) as adopted in §6-56(b). If the alarm system becomes inoperative for any reason, the Fire Chief shall be notified and the provisions of IFC 901.7 shall apply.

(d) *False Alarms*.

(1) Words and phrases defined in §12-121 are used in the same sense in this section unless a different definition is specifically provided.

(2) If the Fire Department responds to a false alarm, the alarm user shall pay the City a fee according to the following schedule of fees for any false alarm occurring in a moving twelve- (12-) month period:

a. First, second, third and fourth false alarms $50.00

b. Fifth, sixth and seventh false alarms $100.00

c. Eighth, ninth, tenth and eleventh false alarms $200.00

d. Twelfth and subsequent false alarms $300.00

e. There shall be no false alarm fee charged for the thirty-day (30) period immediately following the installation of a new alarm system.

(3) If the Fire Department is cancelled by the emergency communications center while responding to an alarm, the alarm user may still be assessed a fee for a false alarm.

(4) Any fees payable to the City which are delinquent may be assessed against the property involved as a special charge for current service, without notice, pursuant to Wisconsin Statutes Annotated §66.0627.

(5) An alarm user may appeal the assessment of a false alarm fee by submitting written documentation to the Fire Chief or designee within ten (10) business days after notification of the assessment of a fee. The Chief or designee must inform the alarm user of the decision in writing. If the alarm user further contests the Chief or designee's decision within ten (10) days of receiving the Chief or designee's decision, the alarm user may seek review by the Safety and Licensing Committee by submitting a written notification to the City Clerk's Office.

(Ord 1-91, §1(19.25), 1-9-91; Ord 7-95, §1, 2-1-95, Ord 65-99, §1, 9-19-99; Ord 117-06, §1, 1-1-07)

Appendix C

Appleton Police Department False Alarm Program

POLICE DEPARTMENT

222 South Walnut Street • Appleton, WI 54911-5899
(920) 832-5500 • Fax (920) 832-5553
http://www.appleton.org/police

"...meeting community needs...enhancing quality of life."

TO: Safety and Licensing Committee members
FROM: Captain Julie Bahr
RE: Proposed changes to alarm ordinance
DATE: 09-08-06

On June 15, 2006 I had the opportunity to meet with the Safety and Licensing Committee to share information about a strategy to reduce the number of false alarms that Appleton Police Officers are dispatched to. This strategy was developed by a committee at the APD, in cooperation with leaders in the alarm industry. I've enclosed a copy of a letter from the president of the Wisconsin Burglar and Fire Alarm Association, who supports the steps we are taking. The Safety and Licensing Committee assigned staff from the City Attorney's office to develop language for the needed revisions to the alarm ordinance, and thanks to Assistant City Attorney, Stacy Doucette you now have the proposed changes before you. Finally, I have also attached a hand out for alarm businesses and alarm users with answers to questions that may be frequently asked.

The following table compares the current ordinance with what is being proposed in the new ordinance. The current alarm system ordinance in Sec. 12 of the municipal code was somewhat confusing since it included aspects of both fire alarm as well as security alarm requirements. The proposed ordinance deals primarily with security alarms. The parts of the current ordinance that were solely applicable to fire alarms were moved to Sec. 6 which deals with Fire Prevention and Protection.

CURRENT ORDINANCE	PROPOSED ORDINANCE
	Adds definitions for alarm business, alarm user, alarm system, enhanced call verification, etc.
	Adds requirements for alarm business permits (this ensures that the businesses know their responsibilities and identifies a responsible agent). Permits are not required for alarm businesses that work ONLY with fire alarms
	Requires use of enhanced call verification by alarm businesses and allows verified response as an option. Not required for response by fire
	Requires alarm devices meet industry standards

	Requires central alarm monitoring stations to meet industry standards
	Requires alarm businesses to keep client and keyholder information current with the central alarm monitoring station (necessary for enhanced call verification)
Provided exception to any official government body or subdivision	Removes exemption for governmental entities (this accounts for about 18% of alarm users)
Includes fees for false fire alarms	Moves fire department false alarm fees to Sec. 6 which contains all of the other language pertaining to fire alarm systems
Moving twelve month period for keeping track of number of false alarms	Calendar year for keeping track of number of false alarm fees (requested by the alarm industry and Finance Dept.). This does not affect false fire alarms.
30 day grace period for installation of new alarms (this was under the fire department fees and wasn't clear if it pertained to other types of alarms)	Eliminate 30 day grace period (enhanced call verification should eliminate the need for this). This does not affect false fire alarms.
Fees for false alarms for police response started at $25 with a max of $100	Fees for false alarms for police response start at $75 with a max of $600 (recommended by the alarm industry as a deterrent to flagrant abusers). False fire alarm fees remain the same
	Accept cancellations while police are enroute. Provides opportunity to appeal fee if proof that enhanced call verification was used.
	Allow for suspension of response for alarm users with 12 or more false alarms within a 6-month period. Provides opportunities for reinstatement. Does not affect false fire alarms.
	Provides exceptions for billing such as criminal activity, other legitimate emergencies, or damage due to weather. Fire has similar provisions added.
	Alarm fees may be appealed to the Fire or Police Chief's or designee with final review by the Safety and Licensing Committee
	Provides penalties for violations by alarm users or businesses

Wisconsin Burglar & Fire Alarm Association

P.O. Box 14188
West Allis, WI 53214
(414)276-9232
(414)453-0036 (fax)
e-mail information@wbfaa.org

A Chartered State Association of the National Burglar & Fire Alarm Association

September 1, 2006

Dear Appleton Council Members,

The Wisconsin Burglar & Fire Alarm Association (WBFAA) represents 65 alarm companies accounting for about 80 percent of the installed alarm systems in the state of Wisconsin. Over the years, alarm systems have proven to be useful tools in fighting crime, as evidenced by the significant growth in new installations each year. But as alarm systems have become more prominent, the number of false alarms has risen to an unacceptable level. The WBFAA desires to bring together the alarm industry, law enforcement, and end users to facilitate ordinances and other guidelines that conserve valuable police resources while still maintaining the highest possible level of public safety.

One of my primary roles with the WBFAA over the past several years has been to work with municipalities and police departments across the state on alarm response management issues. We believe false alarm reduction programs are most effective when law enforcement, the alarm industry, and alarm customers work together to develop solutions that best fit the needs of a particular community. This formula is producing significant results in other Wisconsin communities such as Eau Claire, and Stevens Point. Our approach has focused on three main areas.

First, we have recommended the requirement of Enhanced Call Verification (ECV). In the past, alarm dispatch centers would call the alarm site to verify an alarm before calling the police. ECV is a procedure that adds a second call to a different number (typically the cell phone of an owner or manager) before police dispatch. This second call is an added filter that has proven to reduce false alarms by 30-40 percent with minimal increase in response time.

Second, the WBFAA has been instrumental in facilitating better communication and working relationships between law enforcement and the alarm industry. We have seen amazing results simply by increasing awareness of the impact false alarms have on police resources. Increased awareness and attention build more accountability for alarm companies and alarm customers. In general, we find that most people want to be a part of the solution once they understand the problem.

Third, for the few who don't want to be part of the solution and subsequently abuse the system, we have helped several municipalities develop stronger alarm ordinances. Most of these ordinances contain ECV requirements, stiffer fines for multiple false alarms, and discretion by the police department to suspend response for those unwilling to cooperate.

It has been our pleasure to work with Captain Julie Bahr and her staff on the false alarm issue in Appleton. We believe all three of these areas have been carefully explored. In particular, we believe the proposed alarm ordinance for the city of Appleton addresses all of the critical elements necessary to effectively reduce false alarms. The WBFAA and its members support this ordinance and any other efforts to reduce false alarms in Appleton. We also appreciated the opportunity to be actively involved in the discussions leading up to its development. I would be happy to speak with anyone wanting to learn more about the false alarm reduction efforts going on in the state of Wisconsin.

Sincerely,

Michael Horgan
Wisconsin Burglar & Fire Alarm Association

ARTICLE VI. SECURITY ALARM SYSTEMS*

Sec. 12-121. Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

Alarm business means any person, property owner, firm, partnership or corporation who alters, installs, leases, maintains, repairs, replaces or services an alarm system or which causes any of these activities to take place.

Alarm user means any person, property owner, firm, partnership, corporation or governmental entity whose premise has an alarm system.

Alarm system means a device or system that emits, transmits or relays a remote or local audible, visual or electronic signal indicating an alarm condition and intended to or reasonably expected to summon police or fire services. Alarm system does not include an alarm installed on a vehicle.

Calendar year means the 12-month period beginning January 1 and ending December 31.

Central monitoring station means a central location where remote detection devices installed at the premise of an alarm user automatically transmits a signal and the central location is manned 24 hours a day by trained operators who monitor, receive, record, verify, validate or report the signal.

Emergency communications center means the communications center, located within the Outagamie County Sheriff's Department which handles the emergency phone calls and radio communications for the Police and Fire Departments.

Enhanced call verification means an attempt by the alarm business or its representative to contact the alarm site, alarm user and/or keyholder by telephone and/or other electronic means, whether or not actual contact with a person is made, to attempt to determine whether an alarm signal is valid before requesting law enforcement to respond to the alarm signal, in an attempt to avoid an unnecessary alarm dispatch request. For purposes of this ordinance, telephone and/or other electronic verification shall require, as a minimum, that a second call be made to a different number if the first attempt fails to reach an alarm user or keyholder who can properly identify themselves, to attempt to determine whether an alarm signal is valid before requesting law enforcement dispatch.

False alarm means any signal, message or other communication transmitted by an alarm system, person or other device which causes Police or Fire Department response in which it is determined by the City not to be of an existing emergency or unlawful situation.

Fire Department means the city Fire Department, its headquarters and any other location housing publicly owned equipment serving the Fire Department.

Keyholder means a person or persons who will be responsible for responding to the premise of an alarm activation, who has access to the premise and the alarm system and who has the authority and ability to set or deactivate the system.

Police Department means the city Police Department, its headquarters and any other location housing equipment serving the Police Department.

Private alarm system means any system which, when actuated by an unlawful act, fire or other emergency requiring Police or Fire Department response, transmits a prerecorded message or other signal by telephone, radio or other means to a telephone line in the emergency communications center within the Police Department.

Telephone or electronic device means any device which uses or attaches to a telephone that automatically or electronically selects a telephone line located within the Police Department or the emergency communication center.

Verified response means the alarm business or its representative has verified the legitimacy of an alarm at the scene through independent means such as witness verification, live listening devices or live video monitoring.

Sec. 12-122. Purpose of article.

The purpose of this article is to reduce the number of false alarms by eliminating those which are preventable or avoidable and to establish control of the various types of ~~intrusion, holdup, fire extinguishment, smoke detection and other emergency signals from telephone or electronic devices~~ alarm systems that would require Police ~~or Fire~~ response at the location of an event reported by a signal which is transmitted by telephone or radio or which is otherwise relayed to the emergency communications center by a signal ~~actuated~~ activated by an automated alarm device, including such devices already in use within the city.

Sec. 12-123. Alarm Permits.

(a) **Requirement.** An alarm business shall not alter, install, lease, maintain, repair, replace or service any alarm system in the City of Appleton without first obtaining an alarm permit. An alarm user who uses an alarm system without the assistance of an alarm business must also obtain an alarm permit. If an alarm user who uses an alarm system without the assistance of an alarm business transfers the possession of the premise, the property owner obtaining possession of the property shall obtain an alarm permit or shall contract with a licensed alarm business for services within 30 days of obtaining possession of the property if they continue to use the alarm system. Alarm permits are not required for fire alarms. Alarm permits are not transferable.

(b) **Application.** An alarm business or alarm user desiring to secure a permit shall make application to the City Clerk and shall furnish all information deemed necessary by the Clerk under oath.

(c) **Fee and Duration.** An alarm permit shall be valid through December 31 of the year of its issuance, unless sooner revoked. The fee for the alarm permit shall be on file with the City Clerk's office.

Sec. 12-124. Duties of the Alarm Business

(a) An alarm business shall use enhanced call verification or verified response prior to requesting a response by emergency services. Enhanced call verification or verified response is not required for hold-up, duress, panic or fire alarms.

(b) Any alarm equipment installed by an alarm business after the effective date of this ordinance shall meet the ANSI/SIA CP-01 standards.

(c) A central alarm monitoring station used by an alarm business shall meet the Underwriters Laboratory (UL) or Factory Mutual (FM) standards.

(d) An alarm business shall keep current records of client information including, but not limited to, names of alarm users, keyholders, addresses, phone numbers and other contact information to be used for enhanced call verification and keyholder notification. The alarm business shall provide this information to the central monitoring station.

(e) An alarm business shall provide written and oral instructions explaining the proper use and operation of the alarm system to each of its alarm users. In addition, an alarm business shall take reasonable steps to educate all alarm users in order to minimize the number of false alarms.

(f) An alarm business or representative shall be responsible for notifying a keyholder for the premise when a request is made for response by the police department.

(g) If an alarm user uses an alarm system without the assistance of an alarm business, the alarm user is subject to the same duties as an alarm business.

Sec. 12-~~123~~ 125. Exceptions to article.

(a) None of the provisions of this article shall apply to any official government body or subdivision thereof which owns, operates and maintains its own alarm equipment.

(b) None of the provisions of this article shall prevent the City from providing special alarm monitoring services as may be required because of medical reasons or communicative disorders.

Sec. 12-124 126. Prohibited devices.

No person shall use or cause to permit to be used any telephone or electronic device or attachment that automatically selects a public primary telephone trunk line of the Police Department, Fire Department or emergency communications center and then reproduces any prerecorded message to report any unlawful act, fire or other emergency.

Sec. 12-125 127. False alarm fee.

(a) A false alarm is any signal, message or other communication transmitted by an alarm system, person or other device which causes Police or Fire Department response in which is determined by the City not to be of an existing emergency or unlawful situation. Any fees payable to the City which are delinquent may be assessed against the property involved as a special charge for current service, without notice, pursuant to Wisconsin Statutes Annotated §66.0627.

(b) If the Police Department responds to a false alarm, the alarm user of any private alarm system shall pay the City a fee according to the following schedule of fees for any false alarm occurring in a moving twelve (12) month period calendar year:

(1) For Fire Department response: (Moved to Section 6-20)

a. False alarms 1 — 4 .... $50.00
b. 5, 6 and 7 occurrences............... $100.00
c. 8 — 11 occurrences $200.00
d. 12 and subsequent occurrences . $300.00
e. There shall be no false alarm fee charged for the thirty-day (30) period immediately following the installation of the new alarm system.

For a Police Department response:

1.	First two (2) false alarms	No charge
2.	Third, and fourth and fifth false alarms	$25.00 $75.00
3.	Fifth Sixth, seventh and through eighth false alarms	$50.00 $150.00
4.	Ninth, tenth, and eleventh and subsequent false alarms	$100.00 $300.00
5.	Twelfth and subsequent false alarms	$600.00

(d) **Discontinuance of response.**

(1) If the Police Department is cancelled by the emergency communications center while responding to an alarm, the alarm user may still be assessed a fee for a false alarm.

(2) In cases where the alarm user has 12 or more false alarms within a 6 month period the Police Department may suspend response after the Chief of Police or designee sends written notification to the alarm user. In order to lift the suspension, the alarm user shall submit written confirmation to the Chief of Police or designee that the alarm system has been inspected and repaired, if necessary, and/or additional measures have been taken to reduce the number of false alarms at that location. If the Chief of Police or designee determines that

the actions taken are likely to prevent the occurrence of additional false alarms, the Police Department shall lift the suspension.

(e) **Exceptions and appeals.**

    (1) A fee shall not be charged if any of the following apply:

        (a) The alarm was activated by criminal activity or a legitimate emergency.
        (b) The alarm was activated after a power outage that lasted more then four (4) hours.
        (c) The alarm was activated after the premise was damaged by weather conditions.
        (d) The Fire Department has assessed a fee for a false fire alarm.
        (e) The Police Department was cancelled prior to arriving at the premise and documentation is provided that enhanced call verification or verified response was properly utilized.

    (2) An alarm user may appeal the assessment of a false alarm fee by submitting written documentation to the Police Chief or designee within 10 business days after notification of the assessment of a fee. The Chief or designee must inform the alarm user of the decision in writing. If the alarm user further contests the Chief or designee's decision within 10 days of receiving the Chief or designee's decision, the alarm user may seek review by the Safety and Licensing Committee by submitting a written notification to the City Clerk's Office.

Sec. 12-128. Violations and penalties.

Any person, alarm user or alarm business that violates any of the provisions of this section may be subject to a forfeiture of no more than one hundred twenty-five dollars for the first offense and no more than five hundred dollars for the second and subsequent offenses. Each day that a violation occurs shall be considered a separate offense.

Effective date – This ordinance shall take effect on January 1, 2007.

CITY OF APPLETON
SECURITY ALARM ORDINANCE
ALARM BUSINESS FREQUENTLY ASKED QUESTIONS

When does the new ordinance take effect?
The alarm ordinance goes into effect on January 1, 2007; therefore, all alarm businesses operating within the City of Appleton must obtain a permit by that date. Alarm businesses can obtain a permit at the City Clerk's office in 2006 so they are properly registered for all of 2007.

Why are false alarms a problem?
False alarms take police and firefighters away from real emergencies. In 2005, the Appleton Police Department responded to over 1000 false alarms. While legitimate alarms have helped with the apprehension of criminals, the Appleton Police Department has NEVER apprehended a criminal while responding to a FALSE alarm. While most business and homeowners with alarm systems are responsible and take steps to eliminate unnecessary police response, in 2005 there were 19 locations with nine or more false alarms. Over 95% of all alarm activations are false.

What responsibilities do alarm businesses have to help reduce false alarms?
The ordinance is designed to place greater responsibility and accountability for preventing false alarms on the alarm businesses. Under the ordinance, the alarm business has these responsibilities:

- Obtain a permit from the City of Appleton on an annual basis. Permits are not required for alarm businesses that ONLY work with fire alarm systems.
- Ensure that enhanced call verification or verified response procedures are followed prior to any request for police services. This is not required for hold-up, duress, panic, or fire alarms.
- Install only alarm devices that meet the Security Industry Alarm Coalition standards.
- Use only those Central Alarm Monitoring Stations that meet the standards of Underwriters Laboratory (UL) or Factory Mutual.
- Keep current records of client information, including but not limited to, names of alarm users, key holders, addresses, contact information, and phone numbers (cell phone numbers may be the most helpful) to be used for enhanced call verification and key holder notification and ensure that this current information is available to the central alarm monitoring station.
- Provide written and oral instructions explaining the proper use and operation of the alarm system to each of its alarm users.
- Take reasonable steps to educate all alarm users to minimize the number of false alarms.
- If an alarm user uses an alarm system without the assistance of an alarm business, the alarm user is subject to the same duties as an alarm business.

What is Enhanced Call Verification?
Under enhanced call verification, also known as multiple call verification, the central alarm monitoring station operators call the customer premises and then, if necessary, a second customer-provided phone number, such as a cell phone of a business manager or homeowner, to attempt to verify an alarm before law enforcement is called. Communities that have implemented this procedure have seen significant reductions in false alarm dispatches. This is also a good way for business or homeowners to prevent needless requests for police services, thereby avoiding unnecessary false alarm fees.

Currently, most central alarm monitoring stations make only one call, usually to the alarm premises, before calling the police to dispatch. Many false alarms are generated when employees arrive for work in the morning, but they don't answer the business phones that early so a call from the central alarm monitoring station will go unanswered. Also, when an alarm is activated by an employee or homeowner leaving as they lock up the building, the central alarm monitoring station will call the premises, but of course there is no answer because there is no one left on the premises.

By making a second phone call, preferably to a cell phone, the employee or homeowner can to contacted to verify that the alarm is false and the police are never dispatched.

Enhanced call verification or verified response procedures are not required for hold-up, duress, panic, or fire alarms.

What is Verified Response?
Verified response means the alarm business or its representative has verified the legitimacy of an alarm at the scene through independent means such as witness verification, live listening devices or live video monitoring. The most common example of verified response is a business or homeowner that has contracted with a private security firm who will send trained employees to the alarmed premises when an alarm is activated. They will only contact the police department when they visually verify that criminal activity has occurred or is presently occurring. The Appleton Police Department does not recommend or support private individuals who do their own building checks in response to an activated alarm. This is a dangerous activity.

Verified response is an acceptable alternative to enhanced call verification, but is not required.

Who must obtain an alarm business permit?
Alarm business means any person, property owner, firm, partnership, or corporation who alters, installs, leases, maintains, monitors, repairs, replaces or services an alarm system or which causes any of these activities to take place. This includes the large security companies that have hundreds of clients with alarms in the City of Appleton, as well as the do-it-yourselfer who has installed their own alarm system without contracting with another company. Permits are not required for alarm businesses that work with ONLY fire alarms.

Why does an alarm business have to obtain a permit?
The primary reason is to ensure that the business owners and employees have this information and understand what responsibilities they have to prevent false alarms.

How does an alarm business go about obtaining a permit?
Contact the Appleton City Clerk's office, complete the permit application form, and pay the annual $35 fee. Download form from website (details still need to be worked out with the City Clerk's office)

Will I get a permit certificate once my fee is paid?
Yes, the City Clerk's office will mail you your alarm business certificate. (details still need to be worked out with the City Clerk's office)

What is the fee for an alarm business permit?
The annual fee is $35. Only alarm businesses must obtain a permit. A large alarm business may have hundreds of clients within the City of Appleton and they only pay a single annual fee of $35. However, if you have installed or use your own alarm system and have contracted with a central alarm monitoring station, without using an alarm business, or have the alarm set up so that passerby's will notify the police when they see or hear the alarm signal that was activated, then you need to obtain a permit from the City.
An individual alarm user, who contracts with an alarm business, does not have to obtain a permit.

How long is the permit good for?
The permit fee must be renewed on an annual basis and is good for an entire calendar year, starting on January 1.

What if the contact information on the permit application form changes?
In the event of a change in any information required for an alarm business permit, the owner or applicant must notify the City of Appleton Clerk's office and update the permit application form. There is no fee for updating information.

Is there a penalty for not obtaining a permit for my alarm business?
Yes, the alarm business owner or agent can be subject to a forfeiture of $125 plus court costs for the first offense and up to $500 plus court costs for second and subsequent offenses. Each day that a violation occurs shall be considered a separate offense.

Are alarm permit fees refundable?
No. Alarm business permit fees are not refundable and cannot be prorated.

CITY OF APPLETON
SECURITY ALARM ORDINANCE
ALARM USER FREQUENTLY ASKED QUESTIONS

Who is an alarm user?
Alarm user means any person, firm, partnership, corporation, or governmental entity whose premise has an alarm system.

Why are false alarms a problem?
False alarms take police and firefighters away from real emergencies. In 2005, the Appleton Police Department responded to over 1000 false alarms. While legitimate alarms have, on occasion, helped with the apprehension of criminals, the Appleton Police Department has NEVER apprehended a criminal while responding to a FALSE alarm. While most business and homeowners with alarm systems are responsible and take steps to eliminate unnecessary police response, in 2005 there were 19 locations with nine or more false alarms. Over 95% of all alarm activations are false.

Some communities require that alarm users obtain permits for their alarm system. Is this required in Appleton?
Probably not. The only alarm users that need to obtain a permit are those do-it-yourselfers who install or use their own alarm systems and have contracted with a central alarm monitoring station, without using another alarm business, or have the alarm set up so that passerby's will notify the police when they see or hear the alarm signal that was activated. The ordinance is designed to place the responsibility on the alarm businesses to ensure that the equipment they install will not result in false alarms, that the business representative provides verbal and oral instructions to the alarm user on how the alarm system works and how to prevent false alarms, that the central alarm monitoring station meets professional standards and uses enhanced call verification procedures, that the central alarm monitoring station has accurate and current information on how to contact the right people who can determine the validity of an alarm prior to police dispatch, and that the central alarm monitoring station has accurate and current key holder information.

Will I get in trouble if I contract with an alarm business that does not have a permit with the City of Appleton?
No, the responsibility is on the alarm business to have the proper permit. However, if you have installed or use your own alarm system and have contracted with a central alarm monitoring station, without using another alarm business, or have the alarm set up so that passerby's will notify the police when they see or hear the alarm signal that was activated, then you need to obtain a permit from the City.

What are my responsibilities as an alarm user?
It is important that you work closely with your alarm business to prevent false alarms. They will provide you with information and training on how to properly activate and deactivate your alarm system and most likely will set up a pass code that you will use when contacting the central alarm monitoring station. It is important that ALL employees or family members at the alarm site know the correct alarm procedures.

Another responsibility you have is to make sure that your alarm business has current and accurate information of how to contact one or more responsible individuals in the event that the alarm does go off. With enhanced call verification, the central alarm monitoring station will try to reach someone at the alarm site to determine if there truly is an emergency or if the alarm is false. If they can't reach anyone at the site, they will attempt to call others on their list prior to requesting that the police are dispatched. Enhanced call verification can only be effective if the central alarm monitoring station can reach a person responsible for the alarm site 24 hours a day. A cell phone number for the business owner or manager, or the homeowner, may provide the best means for reaching a person responsible for the alarmed premises.

You also are responsible for providing your alarm business with information of key holders for the alarm site. This may be a business owner, manager, custodian, homeowner, neighbor, or other responsible person who has a key and access to the building and is willing and able to respond to meet the police at the alarm site to determine if there has been criminal activity or other reasons that the alarm was activated, and then to reset the alarm system. If no key holder responds within a reasonable period of time and there does not appear to be any problem at the alarm site, the police will not remain on the scene.

What is Enhanced Call Verification?
Under enhanced call verification, also known as multiple call verification, the central alarm monitoring station operators call the customer premises and then, if necessary, a second customer-provided phone number, such as a cell phone, to attempt to verify an alarm before law enforcement is called. Communities that have implemented this procedure have seen significant reductions in false alarm dispatches. This is also a good way for business or homeowners to prevent needless requests for police services, thereby avoiding unnecessary false alarm fees.

Currently, most central alarm monitoring stations make only one call, usually to the alarm premises, before calling the police to dispatch. Many false alarms are generated when employees arrive for work in the morning, but they don't answer the business phones that early so a call from the central alarm monitoring station will go unanswered. Also, when an alarm is activated by an employee or homeowner leaving as they lock up the building, the central alarm monitoring station will call the premises, but of course there is no answer because there is no one left on the premises.

By making a second phone call, preferably to a cell phone, the employee or homeowner can to contacted to verify that the alarm is false and the police are never dispatched.

Enhanced call verification or verified response procedures are not required for hold-up, duress, panic, or fire alarms.

What is Verified Response?

Verified response means the alarm business or its representative has verified the legitimacy of an alarm at the scene through independent means such as witness verification, live listening devices or live video monitoring. The most common example of verified response is a business or homeowner that has contracted with a private security firm who will send trained employees to the alarmed premises when an alarm is activated. They will only contact the police department when they visually verify that criminal activity has occurred or is presently occurring. The Appleton Police Department does not recommend or support private individuals who do their own building checks in response to an activated alarm. This is a dangerous activity.

Verified response is an acceptable alternative to enhanced call verification, but is not required.

Will I be charged a fee for a false alarm?
Yes, if the police department responds to a false alarm you will be charged the following within a calendar year:

First two false alarms	no charge
Third, fourth and fifth false alarms	$75.00
Sixth, seventh, and eighth false alarms	$150.00
Ninth, tenth, and eleventh false alarms	$600.00

Furthermore, in cases where the alarm user has 12 or more false alarms within a 6 month period the Police Department may suspend response until the user submits written confirmation to the Chief of Police or designee that the alarm system has been inspected and repaired, if necessary, and/or additional measures have been taken to reduce the number of false alarms at that location.

Under what circumstances would a fee not be charged if my alarm goes off?
No fee would be assessed if the alarm was set off due to criminal activity, some other legitimate emergency (i.e. someone has a medical emergency and their only way to obtain help is to activate the alarm system), a power outage over four hours, or damage to the building caused by weather (i.e. during a severe storm, a tree falls on the roof and sets off the alarm). Your alarm system should have a battery backup and other protection that prevents false alarms during electrical storms and brief power outages.

How do I appeal an alarm fee if I believe I should not have been billed?
You can contact the Alarm Administrator, in writing, at the Appleton Police Department. Once officers are dispatched to respond to a false alarm, a false alarm form/bill will be generated. If the alarm is cancelled prior to the time that the officers arrive, they have no further obligation to respond. The bill for cancelled alarms may only be appealed with proof that enhanced call verification or verified response procedures were properly used. Your alarm business should be able to provide you with this written documentation from the central alarm monitoring station. All alarm appeals must be received within 10 business days after notification of the assessment of a fee. The current Alarm Administrator is:

Lt. Erik Misselt

Appleton Police Department
222 S. Walnut St.
Appleton, WI   54911
erik.misselt@appleton.org
920-832-5553 (fax)

What if the bill for an alarm fee is not paid?
Any fees payable to the City that are delinquent may be assessed against the property and will show up on the property tax bill.

How can I reduce false alarms?
Work closely with your alarm installer to purchase a system that meets your needs. For example, a home with pets may not be a good fit for a system that uses motion sensors. Be sure to read and understand the owner's instruction manual for the alarm system and share the information with all employees or family members who have access to the alarmed building. Other tips to follow include:

- Educate all users on how to properly activate and deactivate the alarm and make sure they know any pass codes. Businesses and schools should train new employees and provide frequent refresher training.
- Routinely check the battery back-up system and perform any other needed maintenance.
- Keep operating instructions near the keypad.
- Secure all doors and windows.
- Remove moveable objects from the field of detection of motion detector sensors. Advertising banners, balloons, paper blowing due to ventilation systems, rodents, and flying insects have all been causes of false alarms.
- Keep your contact information current with your alarm company so that the central alarm monitoring station can call you or someone else from your contact list to determine if the police should be dispatched.
- If you do set off your alarm by accident or even think you set off your alarm unintentionally, call your central alarm monitoring station immediately to cancel the alarm. Do not call 911.
- Have your alarm business check the sensitivity of all alarm sensors and perform periodic maintenance on your system.
- Contact your alarm business if your alarm goes off for no apparent reason.
- Additional tips can to obtained from your alarm business or checking websites, such as the False Alarm Reduction Association, www.faraonline.org.

Appendix D

APD False Alarm Ordinance Update Memorandum

MEMO

TO: Safety and Licensing Committee
FROM: Captain Julie Bahr
RE: False Alarm Ordinance Update
DATE: 05-04-07

In 2006, research and discussion took place to develop a strategy to reduce the number of false burglar alarms that Appleton Police officers are sent to. This strategy was developed in partnership with representatives from area alarm businesses. These discussions helped contribute to an 11% reduction in false alarms in 2006, as compared to 2005.

On January 1, 2007 a revised alarm ordinance, enacted by the Appleton City Council took effect. Among other things, the ordinance requires that alarm businesses obtain a permit, that the businesses use a procedure called enhanced call verification, and increased fees for false alarm responses. From January 1 to April 30, 2007 these changes have led to an 18.6% reduction in false alarm dispatches, as compared to the same time period last year.

One of the most noteworthy successes is the Appleton Area School District that has been very successful in reducing false alarms. In 2005 the School District had 138 false alarms that officers were dispatched to. So far in 2007 they have had three. Outstanding!

On the other hand, there are a few places that continue to be a problem. The worst offender is a financial institution that so far, has had eleven false alarms. There has been extensive communication with the bank management and alarm business. The alarm business has been warned for violating the ordinance by not following the enhanced call verification procedures. The false alarms continue even after pointing out that if they have an average of three false alarms per month, the bank will pay $15,975 in false alarm fees by the end of the year. It is unlikely that they will ever pay that much, since they will soon fall into the category where police response will be suspended unless it is determined a real emergency has occurred through independent verified response.

Continued dialog with alarm businesses and alarm users will take place to cooperatively work together to reduce false alarm dispatches. The new false alarm ordinance has provided the needed tools to address this community concern.

Appendix E

Appleton Fire Department Response Guideline

APPLETON FIRE DEPARTMENT		TITLE: APPARATUS RESPONSE TO VARIOUS INCIDENTS	
S.O.G. 2-108	ISSUE DATE: 9-16-04	SECTION: Response Guidelines	FILE NAME: K\FIRE\SOG\RESPONSE GUIDELINES\108
SUPERSEDES: 2-108 DATED 6-7-04	AUDIENCE: All AFD Employees		TOTAL PAGES: 3
COMBINES: 1-90, 2-108, 2-110, 2-116, 2-120 AND 2-121		STAFF APPROVAL: 9-16-04 REVIEWER: B/C Baker/D/C Reece	

I.   PURPOSE:

To establish appropriate apparatus response to incidents. This S.O.G. does not include specialty types of incidents such as confined space, hazardous materials, water rescue, EMS, etc... Specific policies and /or S.O.G.'s exist that address response procedures for those specific incidents.

II.   POLICY:

Outagamie 9-1-1 will dispatch the appropriate fire unit(s) with the initial dispatch   done by voice transmission followed by MDC transmission.

III.   DISCUSSION:

Outagamie 9-1-1 uses a computer aided dispatch (CAD) system to determine which vehicles will be dispatched to an incident. This S.O.G. is a reflection of the CAD system with regards to apparatus types, how many, and how apparatus should respond.

IV.   DEFINITIONS:

A. **Emergency Response:** Responding in accordance with State Statue 346.03 utilizing emergency warning lights and audible warning sirens in a manner that is exempted from the normal rules of the road.

B. **Non-emergency Response:** Responding following the normal rules of the road with no activation of warning lights or audible devices.

V.   PROCEDURES:

- **Structure Fire**

A First Alarm assignment shall consist of three (3) Engine Companies, a Truck Company and a Shift Commander**.** This is an emergency response for all units except the third engine, which will respond non-emergency.

- **Fire Alarms**

For the purpose of the Appleton Fire Department, a fire alarm is defined as any automatic detection system, suppression system or manual pull box that

produces an audible warning locally and/or is received by a monitoring agency. The correct response will consist of two engines, one ladder truck and a Shift Commander. All calls received as an alarm sounding without any additional information, whether it is from a monitoring agency or the facility itself, should be considered as an emergency response for the first in unit or units, and a non-emergency response for the second in or subsequent units.

While in route should the first in unit or units obtain additional information from Outagamie 9-1-1 which confirms that the alarm is a false alarm, i.e.: (young child pulled alarm, contractor on-scene caused alarm, which has been verified by a building representative with proper identification), during normal business hours, Monday – Friday 0800-1630, the first in unit will downgrade the response to non-emergency and all other responding units will go available. The person making the initial size-up will determine if additional units are needed and have them respond in the appropriate response manner. After normal business hours, and on weekends, all responding units will downgrade to a non-emergency response. The person making the initial size-up determines if the response shall continue as is, be stepped up to full emergency response or if other responding units can go available.

In task force response, the truck and engine will respond in the emergency mode when responding together as first in units. If during normal business hours, Monday – Friday 0800-1630, the first in task force unit downgrades the response to non-emergency, the second in task force responding unit will go available.

Additional information may cause the initial response to be stepped up at the discretion of the Incident Commander, Shift Commander, or the Officer-In-Charge. This decision would be an exception rather that the norm. The Shift Commander may elect to respond in either mode.

A. **Vehicle Fires**
   When dispatched for a vehicle fire, the first in Engine Company responding will respond in the emergency mode. The next closest Engine Company will respond non-emergency unless additional information given during dispatch or from the first arriving unit warrants an upgraded response.

B. **Vehicle Extrication**
   When dispatched for vehicle extrication, the first due Engine Company and 321 will respond in the emergency mode. If the incident is located in district one, 321 will respond in the emergency mode and the next closest fire unit will respond non-emergency. Should 321 and 341 respond as a task force out of station one, both will respond in the emergency mode. If the incident is located in district two, 322 will respond in the emergency mode and 321 will respond non-emergency. A Shift Commander will also be included in the

initial dispatch from Outagamie 911. If additional information is given during dispatch or from the first arriving unit, an upgraded response may be warranted.

C. Dumpster Fire

One Engine Company will be dispatched to a dumpster fire. It will respond in the emergency mode.   An upgraded response (additional units) may be warranted if additional information is given during dispatch or from the first arriving unit.

D. Service Calls

One Engine Company will be dispatched to service calls. These types of calls will typically be non-emergency responses unless the Officer In Charge determines that there is possible imminent danger to life and/or property.

E. Tanker Response (currently not part of CAD unit dispatch)

When requested for mutual aid, the tanker will respond with two personnel, one of which is a qualified driver. When requested in the City, the tanker will respond with a qualified driver.

When a call comes in to the non-water areas of the City, the tanker will be included in the initial response. If responding with only one person on board, the vehicle will respond in the non-emergency mode. If the tanker is staffed with two personnel, the tanker will respond in an emergency mode.

At the Shift Commanders discretion, the above guidelines may be altered to facilitate a more appropriate and efficient response.

Additional Policies and S.O.G.'s dealing with response issues for specific special operations and other incidents:
1-86,1-151
2-42, 2-45, 2-57, 2-64, 2-140
3-10, 3-31, 3-32
State Statue 346.03

Appendix F

Underwriters Laboratories (U/L) Alarm Certification Program

Alarm System Certificate Services

Alarm Companies who are Listed and those wishing to learn how to become Listed will be able to see how the Listing process works and what to expect from UL during the Listing Process and during the on annual audit process. This site includes the documents needed to prepare for inspection and the forms needed to issue certificates.

Additionally, as part of UL's ongoing support and training efforts we offer educational seminars for AHJ's and alarm companies. These seminars can be customized to your needs and audience.

Specifying a UL Listed alarm installing company and a UL Listed central station is common practice for many code authorities and system designers. Often, these specifications are made without a clear understanding of what "Listed" means. These frequently asked questions may help.

- What does "Listed" mean?
- What does "Listed alarm service company" mean?
- What does "Listed central station" mean?
- What does "Certificated alarm system" mean?
- Do all alarms installed by a Listed company or monitored by a Listed central station comply with UL requirements?
- Does a Certificated alarm system cost more?

What does "Listed" mean?

UL's product safety certification programs are well known by many people. Under these programs, a company submits representative samples of a product. When UL finds that the samples comply with the applicable requirements, the manufacturer is authorized to use the UL Listing Mark on any products that continue to comply with requirements. Our follow-up inspection service is then initiated to countercheck actual, on-site production for compliances. The Listee's name (often, but not always the manufacturer) is also added to UL's Product Directories.

Manufacturers are not obligated to use the UL Listing Mark on all products. Products that do not bear a UL Mark are not required by UL to comply with UL's requirements. Just because a product model number is listed under a company name in a directory does not imply that a specific device complies with UL's requirements. Only those products that bear a UL Listing Mark are considered UL Listed.

What does "Listed alarm service company" mean?

"Listed alarm service company" is a common, short hand way of saying that a company is authorized to use the UL Listing Mark on alarm services that are in compliance with UL's requirements. For alarm systems the UL Mark is a Certificate.

What does "Listed central station" mean?

"Listed central station" is a common way to refer to an alarm monitoring facility that has demonstrated the ability to provide Standards complying service. In the case of

monitoring stations, UL requirements cover building structure, receiving and monitoring equipment, and staffing issues; in addition to installation and ongoing service. In order to be able to provide Standards complying service, the building, equipment and staffing requirements have to be met at all times. However, the handling of specific signals from specific alarm systems is only audited by UL if a Certificate is in effect for that alarm system.

What does "Certificated alarm system" mean?

A "Certificated alarm system" is one where the Certificate issuing alarm company declares that Standards complying alarm service is provided. It is equivalent to a manufacturer whose name appears in a UL Product Directory choosing to place a UL Mark on a specific production product. A Certificated alarm system is subject to random audit by UL alarm system auditors to countercheck compliance, just as a product with a UL Mark is subject to random audit.

Do all alarms installed by a Listed company or monitored by a Listed central station comply with UL requirements?

UL can only audit alarm systems for which Certificates have been issued. So, we cannot answer this question with a definable level of certainty. Many non-Certificated systems may comply with requirements. Many do not. A non-Certificated alarm system is unknown quantity to UL.

The vast majority of alarm systems in the U.S. are not Certificated. Listed alarm companies are not required by UL to issue Certificates for any of the systems they install. Typically, a Certificate is issued only when a customer or authority having jurisdiction requests one.

This means that the majority of alarm systems are designed and installed with a goal in mind, but not necessarily a vision commonly held by all parties. A system that has a Certificate complies with published, nationally recognized standards and codes that provide a baseline common understanding of the system and service provided.

Does a Certificated alarm system cost more?

While UL cannot comment on pricing of alarm service, we often hear the statement that Certification increases costs. Many times, it is difficult to compare alarm systems and service because common elements may not be provided in the systems being considered. Elements that are generally considered minimum ingredients for reliable alarm service include:

- Equipment Listed for the application
- Installation made in accordance with codes and standards
- Trained alarm technicians installing the system
- Repair service by trained alarm technicians
- A preventative maintenance program by trained alarm technicians

If these elements are in place in two competing systems, the cost of a Certificated alarm system should be competitive with a similar non-Certificated system. Systems and service features being equal for any two competing alarm packages, the charge UL makes to an alarm company per certificate is between $33 and $80 per year. Often, jurisdiction authorities can influence total cost of ownership through choices of codes, standards, editions and local deviations.

Appendix G

National Fire Incident Reporting System Codes

Malicious, mischievous false alarm
711 Municipal alarm system, malicious false alarm. Includes alarms transmitted on street fire alarm boxes.
712 Direct tie to fire department, malicious false alarm. Includes malicious alarms transmitted via fire alarm system directly tied to the fire department, not via dialed telephone.
713 Telephone, malicious false alarm. Includes false alarms transmitted via the public telephone network using the local emergency reporting number of the fire department or another emergency service agency.
714 Central station, malicious false alarm. Includes malicious false alarms via a central-station-monitored fire alarm system.
715 Local alarm system, malicious false alarm. Includes malicious false alarms reported via telephone or other means as a result of activation of a local fire alarm
710 Malicious, mischievous false alarm, other.
Bomb scare
721 Bomb scare (no bomb).
System or detector malfunction. *Includes improper performance of fire alarm system that is not a result of a proper system response to environmental stimuli such as smoke or high heat conditions.*
731 Sprinkler activated due to the failure or malfunction of the sprinkler system. Includes any failure of sprinkler equipment that leads to sprinkler activation with no fire present. Excludes unintentional operation caused by damage to the sprinkler system (740 series).
732 Extinguishing system activation due to malfunction.
733 Smoke detector activation due to malfunction.
734 Heat detector activation due to malfunction.
735 Alarm system activation due to malfunction.
736 Carbon monoxide detector activation due to malfunction.
730 System or detector malfunction, other.
Unintentional system or detector operation (no fire). *Includes tripping an interior device accidentally.*
741 Sprinkler activation (no fire), unintentional. Includes testing the sprinkler system without fire department notification.
742 Extinguishing system activation. Includes testing the extinguishing system without fire department notification.
743 Smoke detector activation (no fire), unintentional. Includes proper system responses to environmental stimuli such as non-hostile smoke.
744 Detector activation (no fire), unintentional. A result of a proper system response to environmental stimuli such as high heat conditions
745 Alarm system activation (no fire), unintentional.
746 Carbon monoxide detector activation (no carbon monoxide detected). Excludes carbon monoxide detector malfunction.
740 Unintentional transmission of alarm, other.
Biohazard scare
751 Biological hazard, malicious false report.
False alarm and false call, other
700 False alarm or false call, other.

Appendix H

Cover Letter and Research Survey

"…meeting community needs…enhancing quality of life."

Dear Chief,

I would like to take this opportunity to introduce myself. I am Gene Reece with the Appleton Fire Department. I currently serve as Operations Deputy Chief for our career fire department. I am currently enrolled in the second year of the Executive fire Officer Program at the National Fire Academy. As a component of the program, I am required to write an Applied Research Project (ARP).

As a department, we have continually seen a rise over the years of false fire alarms. In addition, we expend a lot of resources responding to active fire alarms, which turn out to be false fire alarms upon our arrival. As a component of my research paper, I have chosen to evaluate our current practices in reducing false alarms, reducing the expended resources and costs of false alarms, and enhance the safety of our community by overall reducing the impacts of false fire alarms to the community.

Attached to this letter, is a one-page survey soliciting information regarding false fire alarms. I ask that either you or a member of your staff complete the survey to the best of your ability and email the completed survey back to my attention at gene.reece@appleton.org. I will use the information gathered as part of my ARP, but also as part of the overall review and improvement of our department's response and practices in reducing the impact of false fire alarms.

Should none of the components of the survey involve your department, if you could please complete the first two questions and return the survey it would be greatly appreciated.

Thanks again for your assistance in my research.
Sincerely yours,

Eugene R. Reece Jr.
Deputy Fire Chief

As a component of my Applied Research Project (ARP) for the National Fire Academy Executive Fire Officer Program, I am conducting a survey to gather information related to the response and reduction of false fire alarms classified by NFIRS as 700 series. I ask that you spend a few minutes answering the following questions. Upon your completion, please email this documents back to me at gene.reece@appleton.org. Please return this survey by **September 19, 2008**

1. Fire Department Demographics – makeup of the department
__Career (100% Career) __Mostly Career (51-99% Career) __Mostly Volunteer (1-50% Career)
__Volunteer (0% Career)

2. Community Demographics – population of response area
_____less than 25,000_____25,000-49,999   _____50,000-74,999
_____75,000-99,999 _____100,000-149,999   _____over 150,000

3. Total number of <u>non-medical</u> responses during 2007.
_____**(Total number of calls without medical calls included)**

4. Total number of False Fire Alarm Responses (NFIRS 700 Series) – response for 2007
_____ **(Total number of false fire alarms within the NFIRS 700 series)**

5. Please check which best identifies your department response to activated fire alarms.
   (**Emergency response = lights and siren   Non-emergency response = no lights and sirens**)
_____All units respond in emergency mode
_____Primary unit responds in emergency mode others units respond non-emergency
_____All units respond in non-emergency mode

6. Please check which best identifies your department as it relates to the number of units by type responding to an activated fire alarm.

	0	1	2	3	4
Engine/Pumper Companies	0	1	2	3	4
Truck/Ladder Companies	0	1	2	3	4
Heavy Rescue Companies	0	1	2	3	4
Command Vehicles	0	1	2	3	4
EMS Vehicles	0	1	2	3	4

7. Does your department have any of the following programs to reduce false fire alarms?
        (Select all that apply)
_____False Alarm Billing Ordinance (if yes, who is billed)
        ___Owner ___ Occupant ___ Contractor ___Alarm Company ___ Monitoring Agency
_____Alarm Company Registration Program (if yes, who is registered)
        ___ Alarm Install/Repair Technician ___ Alarm Company ___ Monitoring Agency
_____Fire Alarm Education Program (if yes, who is the education provided to)
        ___Owner __ Occupant __ Alarm Contractor __Alarm Company Other_____

_____

8. Using (1) as the most frequent, based on 2007 responses, list in order (1-5) what causes the most false fire alarm responses within your response area.
___ Pull Station Activated
___ Burnt Food – System activation by non-hostile smoke (NFIRS Type 743)
___ During Construction, construction work activated alarm
___ Alarm Technician failed to notify Alarm Company during maintenance
___Owner/Occupant failed to notify Alarm Company during testing

Appendix I

Draft Appleton Fire Department Alarm Response Guideline

Fire Alarms – Normal Hazard occupancy
Definition: Normal Hazard Occupancy – An occupancy identified by the department as containing low hazards, no historic fire event history, built in fire protection systems, protected high/special occupant demographics (Examples: Office buildings, manufacturing buildings, schools, residential buildings)

For the purpose of the Appleton Fire Department, a fire alarm is defined as any automatic detection system, suppression system or manual pull box that produces an audible warning locally and/or is received by a monitoring agency. The initial dispatched response will consist of one engine and a Shift Commander. The shift commander will monitor the incident, however actual response will be at the shift commander's discretion. All calls received, as an alarm sounding without any additional information, whether it is from a monitoring agency or the facility itself, should be considered as non -emergency response for the first in unit.

While in route should the first in unit obtain additional information from Outagamie 9-1-1 which confirms that the alarm is an actual fire the responding unit upgrades the response to emergency and will direct the communications center to initiate a structure fire response dispatch

Additional information may cause the initial response to be stepped up at the discretion of the Incident Commander, Shift Commander, or the Officer-In-Charge. This decision would be an exception rather that the norm. The Shift Commander may elect to respond in either mode.

Fire Alarms – High Hazard occupancies

Definition: High Hazard Occupancy – An occupancy identified by the department as containing special hazards, historic fire event history, unprotected high/special occupant demographics or a building in excess of four stories. (Examples: Oneida Heights, Washington Street Apartments, Kohler Hall)

The initial dispatch will consist of two engines, one ladder truck and a Shift Commander. All calls received, as an alarm sounding without any additional information, whether it is from a monitoring agency or the facility itself, should be considered as an emergency response for the first in unit or units, and a non-emergency response for the second in or subsequent units.

While in route should the first in unit or units obtain additional information from Outagamie 9-1-1 which confirms that the alarm is a false alarm, i.e.: (young child pulled alarm, contractor on-scene caused alarm, which has been verified by a building representative with proper identification), during normal business hours, Monday – Friday 0800-1630, the first in unit will downgrade the response to non-emergency and all other responding units will go available. The person making the initial size-up will determine if additional units are needed and have them respond in the appropriate response manner. After normal business hours, and on weekends, all responding units will downgrade to a non-emergency response. The person making the initial size-up determines if the response shall continue as is, be stepped up to full emergency response or if other responding units can go available.

In task force response, the truck and engine will respond in the emergency mode when responding together as first in units. If during normal business hours, Monday – Friday 0800-1630, the first in task force unit downgrades the response to non-emergency, the second in task force responding unit will go available.

Additional information may cause the initial response to be stepped up at the discretion of the Incident Commander, Shift Commander, or the Officer-In-Charge. This decision would be an exception rather that the norm. The Shift Commander may elect to respond in either mode.