DEVELOPMENT OF A PLAN
TO IMPLEMENT NFPA 1710 IN THE MONROE FIRE DEPARTMENT

EXECUTIVE LEADERSHIP

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ABSTRACT

The problem identified in this research project was that the Monroe Fire Department needed to evaluate the potential effects of the National Fire Protection Association’s (NFPA) Standard 1710 on the department and develop a plan to implement the standard in Monroe.

The purpose of this research project was to evaluate the potential effects of NFPA 1710 and develop a plan to implement NFPA 1710 in Monroe.

The action research method was used to accomplish this purpose and to answer the following questions:

1. What are the potential benefits for the citizens of Monroe and the employees of the Monroe Fire Department of implementing NFPA 1710 in Monroe?
2. What are the key issues associated with implementing NFPA Standard 1710 in the Monroe Fire Department?

The procedures used in this research project was to analyze the available material related to the problem and to apply new information, theories, and methodologies available from outside sources to solve the problem.

The results of this study were that there were various potential impacts of NFPA 1710 on Monroe. These impacts included the possibility of an increased level of service consisting of faster response times with more personnel per fire apparatus responding to an emergency call.

The recommendations for the Monroe Fire Department were to begin implementation of NFPA 1710 utilizing a plan developed as a result of this research. This plan includes providing information to the elected officials and the general public in Monroe outlining the potential effects of NFPA 1710 on Monroe and includes recommendations on determining proper
locations for future fire stations to continue to meet the recommendations of NFPA 1710 response guidelines and a recommendation to monitor the implementation of NFPA 1710 to make any necessary changes.
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INTRODUCTION

One of the most important goals we have facing us in the fire service is the challenge of providing high quality service to our citizens while creating a safe environment for our firefighters to operate in. The National Fire Protection Association (NFPA) and other organizations are instrumental in providing guidance through codes and standards to assist fire service leaders in accomplishing this goal. NFPA 1710 “Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments” is one such standard that will no doubt change the way many fire departments do business. It also is a standard that can be beneficial in helping many departments reach the performance level that they desire to be at with regards to providing service to their citizens and the level they desire to be at with regards to firefighter safety.

The problem is that the Monroe Fire Department needs to develop a plan to implement the National Fire Protection Association’s Standard 1710 in Monroe. It should be stressed that the problem of evaluating and implementing NFPA 1710 is not necessarily a bad problem. We tend to associate the word problem as being something bad, however according to Webster (1997) a problem is defined as a perplexing situation or question; a question presented for consideration, solution, or discussion, which fits Monroe’s position with regards to NFPA 1710 at this time.

The purpose of this applied research project is to evaluate the potential effects of NFPA 1710 and develop a plan to implement NFPA 1710 in the Monroe Fire Department. The action research method will be used to accomplish this purpose.

This research project will utilize the action research method to analyze research material available from other authors to answer the following questions:
1. What are the potential benefits for the citizens of Monroe and the employees of the Monroe Fire Department of implementing NFPA 1710 in Monroe?

2. What are the key issues associated with implementing NFPA Standard 1710 in the Monroe Fire Department?

In addition to structural fire response, NFPA 1710 also covers staffing and deployment for emergency medical response, aircraft rescue and firefighting, marine rescue and firefighting, and wildland firefighting. This research will focus only on the structural fire response staffing and deployment aspect of the standard.

BACKGROUND AND SIGNIFICANCE

The role of the fire service is constantly changing, with fire departments providing additional services to our citizens, such as medical first responder, hazardous materials response, rescue, and disaster preparedness. These additional services are much needed and are very valuable to those we serve. The fact remains however that our primary reason for existence is to provide fire protection for our community. The ability to effectively protect life and property through combating and extinguishing fire is an extremely manpower intensive task. We must remain focussed on this constant need for adequate manpower power to arrive at the scene of a home or commercial building fire within an adequate time frame to effectively protect those lives and property that we are charged with protecting. The Monroe Fire Department is committed to meeting this need in our community by continually evaluating and implementing new procedures that will aid firefighters in providing this level of service to our citizens.
NFPA 1710 “Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments” was adopted by the NFPA in August, 2001. This new standard contains recommendations that, if implemented in Monroe, may positively effect the service provided by the Monroe Fire Department. The standard was passed by a membership vote at the NFPA annual meeting on May 16, 2001 in Anaheim, California. The standard was later formally adopted by the NFPA Standards Council and is now in effect.

The city of Monroe was incorporated on December 24, 1844 with the first reported mention of fire service in 1899 when Monroe was praised for it’s volunteer fire service, which was under the direction of Chief J. S. Welch (Kendrick, 1995). The Monroe Fire Department is a department of the City of Monroe, a local government that operates under a city manager form of government with a Mayor and Council as the governing board. Monroe is an all paid career fire department with 48 full time employees. Three engines, one ladder, and one squad/rescue apparatus are operated out of three fire stations serving a population of approximately 26,000 residents in a 25 square mile area. The department currently provides fire suppression services, fire prevention, rescue, emergency medical first responder, and hazardous materials management with an annual call volume of approximately 3000 calls. The department operates with three-person engine companies and a two-person ladder/squad company with a response time of five minutes or less to 78 percent of emergency calls for service. The department obtains a Class Five insurance classification rating with the Insurance Services Office (ISO) and currently has a registered status for fire department accreditation with the Commission on Fire Accreditation International (CFAI).
The Monroe Fire Department is a proactive fire department that strives to provide high quality service to its citizens, however the department has not formally evaluated the potential effects of NFPA 1710 on the department nor has it taken any formal steps toward implementing NFPA 1710 at this time.

This research project is an important step in the Monroe Fire Department implementing NFPA 1710 in its jurisdiction. It’s the opinion of this author that implementation of 1710 will provide benefits for the citizens of Monroe and for the employees of the fire department. It is also believed that meeting the recommendations of NFPA 1710 will be a positive influence in other areas for Monroe such as potentially lowering the ISO classification and being beneficial toward obtaining accreditation. Improvements and accomplishments in these areas will be indications of improved levels of service to our citizens. This study will have a positive impact on the fire department’s present and future ability to provide the level of service desired and will have a positive impact on the organizational effectiveness of the department.

This research project relates specifically to Unit Five of the Executive Leadership Course of the National Fire Academy, entitled “Being in Transition: Understanding Change during Midlife and Beyond”. This unit deals a leader being in transition in the four major spheres of his life including, professional, family, community, and personal. The implementation of NFPA 1710 will be a transition for all personnel of Monroe including the leaders of the department.
LITERATURE REVIEW

The NFPA was organized in 1896 and incorporated in 1930. It produces almost 300 codes and standards developed by over 205 technical committees. NFPA has a twelve-step process to develop and approve new codes. Members of the corresponding technical committee can be found on the opening pages of NFPA codes. All NFPA voting members, regardless of professional affiliation are afforded voting rights (Diamantes, 1997). “Since 1896, the National Fire Protection Association has been the world’s leading nonprofit organization dedicated to protecting lives and property from the hazards of fire” (Kipp and Loflin, 1996).

The purpose of NFPA 1710 as contained in Section 1.2.1 of the standard is as follows; “The purpose of this standard is to specify the minimum criteria addressing the effectiveness and efficiency of the career public fire suppression operations, emergency medical service, and special operations delivery in protecting the public of the jurisdiction and the occupational safety and health of fire department employees” (NFPA 1710, 2001).

NFPA 1710 refers to four firefighter minimum staffing requirements for engine and ladder companies. Company is defined by NFPA as “a group of members…dispatched and arriving together, continuously operating together and…managed by a single company officer…” . The standard also recommends a one minute turn out time and a four minute response time for the first arriving company to 90 percent of emergency calls. An eight minute response time for the full first alarm assignment to 90 percent of emergency calls is also recommended. NFPA 1710 goes on to recommend capability for additional alarm assignments that can provide for additional personnel and additional services, including a dedicated safety officer and two additional rescue team members. The utilization of mutual aid to meet initial and additional alarm responsibilities is allowed (NFPA 1710, 2001).
NFPA 1710 recommends that data be collected and evaluated and requires the fire chief to compile a quadrennial report, to submit to the governing board, containing information regarding calls, staffing and response times. The standard also requires departments to develop an organizational statement containing the following elements; existence of the fire department, services the department is required to provide, basic organizational structure, expected number of fire department members, service delivery objectives, and response time objectives (NFPA 1710, 2001).

A firefighter safety and health system in accordance with NFPA 1500, an incident management system in accordance with NFPA 1561, a communications system in accordance with NFPA 1221, a training system that ensures personnel competency, and a pre-incident planning system are recommended as part of NFPA 1710 (NFPA 1710, 2001).

“Historically, the fire department has been the quintessential ‘local service’, where maximum discretion is left to local officials” (Rukavina, 2001). Some fire chiefs across the country are relieved that there is a national consensus standard the will help with their “burden of proof” and establish a lawsuit-proof fire service environment, while others are concern that NFPA 1710 will increase fire service liability. Rukavina goes on to say that he’s not aware of any law that requires the adoption of any new standard and that if a community does not adopt NFPA 1710, then they are not breaking any law. He does indicate that the community is assuming additional liability risk by not following the recommendations of the standard, but not as much as they would if they adopt the standard and then not follow it. If a community does formally adopt a standard and then does not meet it, then courts are not reluctant to impose liability for not living up to their own standards. With regards to the Occupational Safety and Health Administration (OSHA), the decision as to whether or not NFPA1710 will be a factor in OSHA compliance
issues will be up to the local OSHA practitioners. NFPA 1710 will represent a major change in
the American fire service, “Many fire chiefs will find themselves responsible for managing this
historic shift, mediating between the proverbial irresistible force of NFPA 1710 and the
immovable object of local willingness (or ability) to pay” (Rukavina, 2001).

A document entitled “NFPA 1710: A Decision Guide” has been developed by the
International Association of Fire Chiefs (IAFC) to assist fire chiefs and local government
officials in making complex decisions regarding NFPA 1710. The IAFC’s leadership was
utilized to help develop NFPA 1710 and now the IAFC is available through this document to
help fire chiefs decide the best way to use NFPA 1710 in their community. “NFPA 1710
envisions implementation as a multi-year process” (IAFC, 2001). The IAFC provides a sample
timeline contained within the Decision Guide, which is as follows:

- Standard was issued by NFPA in August 2001.
- Authority having jurisdiction could make a decision regarding implementing NFPA 1710 as
early as December 2001.
- Quadrennial report for the period 2002-2005 distributed to the authority having jurisdiction.
  This report must include areas not currently meeting the standard, predictable consequences
  of those deficiencies, and steps necessary to achieve compliance (NFPA 1710, 2001).

One of the most controversial subjects in the history of the fire service is the subject of
staffing. Efficiency as opposed to firefighter safety has been the measure for firefighter staffing
in the past. It wasn’t until recently that the issue of staffing became linked to firefighter health
and safety (Clark, 1994).
In testimony given by Kenneth O. Burris, Chief Operating Officer of the United States Fire Administration, to the House Committee on Transportation and Infrastructure Subcommittee on Oversight, Investigations, and Emergency Management on April 12, 2001; Mr. Burris makes the following statement, “H. R. 1168 even further enhances the potential impact that FEMA can have in the area of firefighter health and safety by expanding the approved use of grants to allow a local fire department to address staffing levels (Burris, 2001).

In a Special Interest Bulletin, issued by the National Board of Fire Underwriters in 1959, on the issue of firefighter staffing. The bulletin recommended five members minimum with six or seven considered optimum for high hazard areas. The principal consideration for this recommendation was efficiency of crews however and not firefighter safety. The only reference this report had to firefighter safety was that it was unsafe to allow one firefighter to enter a building alone. Linkage of firefighter staffing to efficiency had evolved from years of fire service personnel considering staffing concepts from insurance groups such as the Insurance Services Office (ISO). ISO’s primary concern focused on firefighter efficiency from a standpoint of property conservation and not firefighter safety (Varone, 1994).

Varone also references O’Hagan, who in 1984 wrote in a series of articles for Fire Engineering about a staffing study that was done for the Dallas Fire Department. The Dallas study consisted of measuring the time it took for three and four man crews to do specific fireground tasks. The Dallas study did indicate results showing crews less than four people lead to overtaxing of the crew which led to higher fire losses, however the study did not factor in firefighter safety.

Varone (1994) conducted a staffing study for the Providence Fire Department as an Applied Research Project for the Executive Fire Officer Program at the National Fire Academy. Varone
cited Whitehead from 1992 in saying that staffing was directly related to firefighter safety and that numerous statistics and unpublished research information tended to show that firefighter injuries increased dramatically when staffing went below four firefighters per apparatus. Varone also cited Stapleton from 1992 who wrote about his experiences with the Boston Fire Department. He indicated that although equipment had improved over the years, that this had not lessened the need for adequate staffing. Varone quotes Stapleton (1992, p.3) as saying the following:

By the start of the 1960’s, the seven and six member companies were reduced to six and five. In the 1970’s, the numbers shrunk to five and four and at the start of the 1980’s, all companies, ladder and engine, had only four personnel responding per unit. At one point in 1981, the administration reduced staffing to three members, but there were so many additional injuries that this truly unsafe policy was reversed in a short period of time.

In Varone’s staffing study in the Providence Fire Department, the study period consisted of a six-month time period in which six companies, three engines and three ladders, were staffed with four personnel. This study period was compared with a control period of the same months of the year for the year prior to the study period. There were a total of 31 firefighter injuries during the study period compared to 42 firefighter injuries during the control period. This represents a 23.8 percent reduction in the number of injuries on the companies with four man staffing over the companies with three man staffing. The number of loss time injuries (injuries in which the member was not able to report for duty) was also compared. This allowed an evaluation of the more serious firefighter injuries that required a firefighter to miss work because of their injury. The loss time injuries during the study period was 23 compared to 31 loss time injuries during the control period. This resulted in 25 percent fewer loss time injuries on companies in which
the staffing level had been increased to four instead of three. To further examine the loss time statistics, the amount of lost time was compared between the study and control periods. During the study period there were 1,832 shifts lost due to injuries as compared to 531 shifts lost due to injury during the control period. This represented a 71 percent decrease in the amount of time lost during the time of increased staffing. Based on the study the number of incidents responded to during the control and study periods was virtually the same. The number of injuries, the number of loss time injuries, and the time lost due to injuries all decreased substantially in the four member study companies during the study period, as compared with the three member study companies during the control period.

According to a publication produced by the International Association of Fire Fighters (IAFF) entitled Safe Fire Fighter Staffing firefighting remains to be one of the most dangerous professions in North America. Despite the many safeguards and many technology advances, firefighting remains to be a very labor-intensive occupation that requires an adequate number of firefighters to safely carry out the roles and responsibilities of the service. The fire service has learned from grim experience that inadequate staffing on the fireground can result in unnecessary loss of life and serious injury to both firefighters and to the public. For this reason knowledgeable fire service professionals have consistently supported minimum firefighter staffing levels of at least four persons on an engine company (IAFF, 1993).

NFPA Standard 1201, Developing Fire Protection Services for the Public (1994, p. 1201-5) Section 2-1 defines the purpose of a fire department as:

the fire department shall have programs, procedures, and organization for preventing the outbreak of fires in the community and to minimize the danger to persons and damage to property caused by fires that do occur. The fire department shall also carry out other
compatible emergency services as mandated.

NFPA specifies that a fire department should provide fire suppression services and shall be organized to effectively combat fires with the priorities being to save lives, limit the spread of fire, extinguish the fire, and minimize property damage from fire-related hazards (NFPA 1201, 1994).

The Occupational Safety and Health Administrations Respiratory Protection Regulation, commonly referred to as the two-in two-out rule, requires sufficient personnel on a fire scene to have two persons assigned as a rescue team to rescue firefighters if necessary. The two additional personnel must be on scene and available for rescue before an interior fire attack can be made (Respiratory Protection; Final Rule 1998).

“Virtually no two fire departments in North America are organized the same. Therefore, any discussion on fire department organization must be made in a very general way....” (Wider, 1993 p. 95).

To receive full credit for personnel under the Insurance Service’s Office (ISO) grading schedule a department needs to have 18 firefighters responding on the first alarm. A standard response under the ISO schedule is two engines and one ladder response on all structure alarms (Hickey, 1993).

An effective fire-ground operation centers around one incident commander. If there is no command, or if there is multiple commands, fire ground operations quickly break down in seven predictable areas: Action, Command and Control, Coordination, Planning, Organization, Communications, Safety....Fire with no command or having multiple commands tend to produce chaotic, ineffectual action (Brunacini, 1985, p.2).

In a study conducted by the North Carolina League of Municipalities on the Public Safety
Delivery System for the city of Monroe, it was pointed out that there needed to be company fire officers and a fire ground command structure implemented in the Monroe Fire Department. The study also indicated that locating of fire stations to provide a five-minute response time was optimum to allow firefighters to arrive at fire scenes prior to flashover to reduce property loss in fire buildings. It was also recommended that phasing in of additional personnel over a period of three years would be more financially feasible on the governing board (Pickard, 1998).

Because fire suppression budgets will remain very tight, there will be continued use of call-back and part-time personnel, as well as fewer stations and longer run times. It seems likely that many small to mid-sized communities with career departments will staff task force groups for initial attack with full-time, on-duty personnel at fewer stations, and will use paged callbacks on reserve apparatus to handle sustained attack and simultaneous runs (Granito, 1995, p. 1140).

A municipality is authorized by N.C. General Statute 16A-291 to appoint a fire chief, employ firefighters, organize a fire department and prescribe the duties of the fire department. The municipality is not required to furnish fire protection services as a municipal service, but is authorized to do so if they desire to. North Carolina General Statute [G.S. 160A-292] defines the duties of the fire chief as “direct firefighting and training activities, preserve the fire apparatus, have dangerous conditions corrected when the condition constitutes a fire hazard, and make annual reports to the municipal governing board concerning department activities” (Loeb, 1993).

In a report of the National Commission and Control there was emphasizes on the local responsibility to provide fire protection services. Each community is unique and their individual fire protection needs are different and that what works for one community cannot be assumed to
work well in other communities. The report also questions if there are better ways to provide fire service than the traditional ways. The report sites the need for careful assessment by individual communities for future investments of personnel, equipment or new programs in order to provide better fire protection services (America Burning, 1973).

We are being challenged to provide the greatest possible level of service to our communities for the tax dollar spent, and I believe the days when tax payers never questioned the services provided or lack of services provided, are gone for most departments today. We are not just a fire department anymore and the public is expecting more and higher levels of service (Marrs, 1996, p. 10).

“The public no longer views quality fire protection as a luxury that can be afforded in communities blessed with a large tax base. Effective fire protection is seen as a taxpayer’s right and a township’s obligation” (Merrill, 1990).

Fire departments in the United States are organized in a variety of ways to meet the specific needs of the community. The role of the fire service has changed over the years with the community having an expectation of service for whatever emergency may occur. “For the majority of people in North America, local government is responsible for providing adequate fire protection and the framework within which the protection operates” (Paulsgrove, 1997).

In summary of the findings of this literature review, there is substantial information available related to staffing and response times that can be applied to NFPA 1710. Much of this information was created prior to the development of this standard, however it has relevant meaning when evaluating and justifying implementation of the standard. There is considerable information available that directly relates increased staffing to a reduction in firefighter injuries and increased performance capabilities of fire crews. There is also information related to
response times that is beneficial in justifying implementation of NFPA 1710. The information found in the literature review will be further discussed in detail later in this report.

PROCEDURES

Research Methodology

The research methodology used in this research project was action research to solve the existing problem of developing a plan to implement NFPA 1710 in Monroe. The procedure used to achieve the purpose of this study was to apply new information, theories, and/or methodologies available from outside sources to solve this problem by developing a plan for Monroe to implement NFPA 1710. The final products of the action research applied in this project can be found in the Appendix A of this report.

The research included a review by this author of relevant material located on the subject. The research material used was obtained from the Learning Resource Center at the National Fire Academy, the Internet, the Monroe Fire Department Library and other books and articles. A search of national regulations and standards from OSHA, NFPA, CFAI and ISO was also conducted and the applicable material as described by reference in this report was utilized to solve this problem.

Limitations

One limitation is that, other than NFPA 1710, there is no one specific way a fire department should perform and there are no specific services that a department should provide. Many authors have differing opinions on this matter and individual department organization and services provided depends greatly on the community and the needs of that community.

There are also limitations in that with NFPA 1710 being a relatively new standard there is limited research material available that is specific to NFPA 1710, however there is an ample
amount of research material available on related subjects that can be applied to NFPA 1710 issues.

Another limitation is the financial consideration given to the city of Monroe. It would be very easy to recommend a plan to implement NFPA 1710 to the fullest extent as soon as possible if money was not an object. The realistic issue is that we cannot recommend a plan that would place an undue financial tax burden on the taxpayers. The desire is to develop a plan that is capable of providing quality services to our citizens with the implementation of NFPA 1710 in a time frame that is affordable to the city.

We are only providing a plan at this time to implement NFPA 1710. We are not able during the time frame of this research project to implement the plan and evaluate its effectiveness in actual use by the department. The plan included in this report should be implemented, then evaluated, and altered to best suit the needs of the Monroe Fire Department.

**Definitions**

CFAI-Commission on Fire Accreditation International  
ISO-Insurance Services Office  
IFSTA-International Fire Service Training Association  
OSHA-Occupational Safety and Health Administration  
NFPA-National Fire Protection Association

**RESULTS**

The results and findings of this research project are that there are many potential benefits of implementing NFPA 1710 in the Monroe Fire Department and that a plan to implement NFPA 1710 in Monroe can be developed. The findings show that NFPA is a long standing organization
dedicated to protecting lives and property from the destruction of fire. The NFPA develops various standards that may be voluntarily adopted, implemented, or used as reference by organizations. NFPA 1710 was developed by a technical committee, passed by the voting membership, and issued by the NFPA in August 2001. NFPA 1710 provides provisions for the health and safety of fire department personnel and provides recommendations to maintain minimum staffing of engine and ladder companies of four personnel. These four person companies can be obtained from personnel riding on separate apparatus as long as they operate as a company under the command of one officer on the emergency scene. Standard 1710 also recommends a response time of one-minute turn out time and four-minute response time to 90 percent of emergency calls. This “five” minute response time may reduce the number of occurrences of flashover prior to the arrival of engines companies. The standard also recommends that the full first alarm assignment of two engines, one ladder, and one command officer arrive to the scene of 90 percent of emergencies within eight minutes. NFPA 1710 also covers other aspects of fire service such as marine protection, EMS response, etc. that was not included as part of this research project. There is much information available that indicates that staffing levels of four or more persons on engine and ladder companies may reduce firefighter injuries on emergency scenes as well as reducing the amount of property damage incurred during fire situations. Other organizations such as ISO and IAFF advocate adequate staffing levels to aid departments in providing higher levels of service during fire emergencies.

The results and findings also show that there are no mandates to adopt or implement NFPA 1710 or other NFPA standards, but that implementation of NFPA 1710 may reduce legal liability of fire department organizations by bringing them into compliance with a nationally recognized standard. It was shown that implementation rather than adoption may be a better method. The
courts do not hold an organization to as high a level of accountability for simply using a standard to implement as a benchmark as they do for an organization that has adopted a standard and then does not meet it.

The results of the procedures followed in this research project, which included researching available current data with the purpose of applying new information, theories, and/or methodologies from outside sources to solve this problem, lead to the development of a plan to implement NFPA 1710 in Monroe, which is included in Appendix A of this project.

**Answers to Research Questions**

1. What are the potential benefits for the citizens of Monroe and the employees of the Monroe Fire Department of implementing NFPA 1710 in Monroe?

   The potential benefits of implementing NFPA 1710 for the citizens are that additional personnel would be responding on engine and ladder companies and those personnel would be arriving quicker to more of the communities emergency calls. This quicker response time and additional personnel should result in less property damage for homeowners experiencing fire in their homes or businesses. The quicker response time would provide, in some instances, an opportunity for the company to arrive and begin to extinguish the fire prior to flashover of the fire, therefore increasing the chance of human survival and increased protection of property.

   There is much information included in the available literature indicating that staffing of four people increase the safety and may reduce firefighter injuries on the emergency scene, which is a major benefit to fire department personnel. Possible lower ISO classification would also benefit the citizens of Monroe by lowering fire insurance premiums in Monroe. Lower insurance rates and accreditation of the department, both of which may be influenced with the additional staffing
levels and development of a statement of purpose of the fire department would have a positive effect on the economic development in Monroe.

2. What are the key issues associated with implementing NFPA Standard 1710 in the Monroe Fire Department?

The primary issue related to the implementation of NFPA 1710 is the cost associated with implementation. Cost of additional personnel for existing companies and possible additional stations and companies to meet the response time recommendations of NFPA 1710 are serious issues for a local government such as Monroe. There are however alternative methods to meet the staffing recommendations such as multiple units responding and operating together at emergency scenes. The flexibility of using mutual aid is also contained in NFPA 1710, however this provision may be somewhat limited in providing assistance in meeting the response time guidelines. Another issue is the time line for implementing the standard, it would lessen the financial impact on Monroe by phasing in the additions necessary to meet NFPA 1710 recommendations over a period of time. Implementation of this standard would lessen the legal liability of Monroe, therefore offsetting the financial burden of implementation.

The IAFC provides a sample timeline contained within the Decision Guide, to assist jurisdictions in implementing the standard, which is as follows:

- Standard was issued by NFPA in August 2001.
- Authority having jurisdiction could make a decision regarding implementing NFPA 1710 as early as December 2001.
Quadrennial report for the period 2002-2005 distributed to the authority having jurisdiction governing board. This report must include areas not currently meeting the standard, predictable consequences of those deficiencies, and steps necessary to achieve compliance.

In conducting a comprehensive analysis of all data included, a plan was developed to implement NFPA 1710 in Monroe. The plan provides steps necessary to implement the standard, including a recommendation to develop a method to compile and analyze data to determine needs to meet NFPA 1710 recommendations. There are recommendations for informing Monroe’s elected officials as well as informing the general public on the potential benefits of NFPA 1710. The plan provides a timeline recommendation for phasing in the standard to allow the city administration time to prepare for additional cost associated with implementation. This plan is located in its entirety in Appendix A of this research project.

DISCUSSION

The NFPA is a long-standing nonprofit organization that provides codes and standards which are developed by technical committees and voted on by its membership (Diamantes, 1997). The NFPA is the world’s leading organization dedicated to protecting lives and protecting property from fire (Kipp and Loflin, 1996). One important function of NFPA 1710 is to address firefighter health and safety by incorporating references to other NFPA standards that contain recommendations on health and safety, communications, training, and incident command (NFPA, 2001). NFPA 1710 also recommends minimum staffing levels and minimum response times of four and eight minutes for at least 90 percent of emergency calls answered by an organization. Fire protection has historically been a local decision and the implementation of NFPA 1710 will be a major change for fire departments around the country (Rukavina, 2001).
The IAFC provides a sample timeline contained within the Decision Guide for jurisdictions to utilize for implementation of the standard. “NFPA 1710 envisions implementation as a multi-year process” (IAFC, 2001).

Brunacini (1985) also specifies that there can only be one fire ground commander and that no command or having multiple commands can produce chaotic ineffectual action.

While this research was not intended as a staffing study, information obtained from ISO was considered in developing the implementation plan. ISO’s staffing recommendation for maximum grading credit is 18 firefighters responding to first alarms (Hickey, 1993). OSHA’s two-in two-out regulation (Respiratory Protection 1998) is a major factor in considering staffing levels for implementation. This regulation requires sufficient personnel on scene to maintain two rescue personnel outside the hazard area for the purpose of rescuing firefighters should the need arise.

We see that NFPA addressed safety and health in the purpose of the standard indicating that firefighter safety was an important part of the standard. The standard also addresses safety in Section 6.1, which states, “A firefighter occupational safety and health program shall be provided in accordance with NFPA 1500, Standard for Fire Department Occupational Safety and Health Program. NFPA 1710 also has provisions in Section 6.2 recommending the implementation of NFPA 1561, Standard on Emergency Services Incident Management System, to form the basic structure of an incident management system to be used by the fire department at all emergency incidents. A training program and policy to ensure that all department personnel are adequately trained to perform their assigned task is recommended in Section 6.3. Reliable communications facilities and equipment with the use of standard terminology is also recommended by the standard in section 6.4. It’s basically common knowledge that these
factors, as discussed above, have been factors in firefighter injury and fatality incidents through the history of the fire service and therefore from these aspects, NFPA 1710 should have a positive impact on reducing firefighter injuries.

The use of call-back and part-time positions can be beneficial to ease the financial impact on smaller cities. (Granito, 1995) This concept along with an auxiliary program would be beneficial to the Monroe Fire Department both during emergencies and during normal operations (Pickard, 1998).

In the report America Burning (1973), the report emphasizes the responsibility of local governments’ to provide fire protection services. The report points out that each community is different and therefore has different needs from its fire department. Lobe (1993) points out that there is no legal requirement for a city in North Carolina to provide fire service to its citizens. Though it’s clear that there is no legal obligation to provide fire services, Merrill (1990) sums it up in saying, “The public no longer views quality fire protection as a luxury that can be afforded in communities blessed with a large tax base. Effective fire protection is seen as a tax payers right and a townships obligation”. Marrs, (1996) appears to agree with this concept, he writes that the public is expecting more and higher levels of service. He goes on to say that we are being challenged to provide the highest level of service to our communities for their tax dollar.

The writings of Whitehead and Stapleton, cited by Varone, provided support for the thinking that the staffing of apparatus with less than four personnel would lead to an increase in firefighter injuries.

According to Safe Fire Fighter Staffing (1993) there has been study after study that has shown similar results as the Providence Fire Department study. Studies that have shown reduced
firefighter injuries with increased company staffing levels include the Centaur/FEMA Study, the Dallas Fire Department Study, the Columbus Study and the Seattle Fire Department Study.

The OSHA Respiratory Protection Rule requires that the employer provide rescue abilities, including personnel and equipment that are staged outside the IDLH atmosphere, for all employees entering IDLH atmospheres (Respiratory Protection; Final Rule 1998).

The following is this authors interpretation of the study results found. It appears that NFPA is an organization that is well known and respected with regards to fire protection information. The development of NFPA 1710 underwent the normal channels required by NFPA to become a standard and should be considered to be a valid and reliable standard for a department to use as a goal to meet. NFPA 1710 would have many positive effects on the city of Monroe, its citizens, and fire department employees. Staffing levels of four persons would have the potential to reduce firefighter injuries on emergency scenes, although Monroe does not have a significant problem related to firefighter injuries, any means of reducing those risks should be considered. The staffing information from ISO was considered and is major consideration related to the department’s goal of lowering the ISO classification. Information from OSHA’s two-in two-out regulation, as with any OSHA regulation is a primary concern of any fire service agency and the implementation of NFPA 1710 will help assure adequate personnel to meet this OSHA requirement.

It is clear from the research that there are no mandates to implement NFPA 1710 or any other NFPA standard and actually there is no mandate for local governments in North Carolina to provide any form of fire protection. It is apparent that since Monroe has chosen to provide fire protection that the implementation of NFPA 1710 would be beneficial in improving the level of service that the department can provide.
There is also a significant amount of information available through research that indicates that four person staffing provides a safer environment for firefighters than three or less persons per company. Studies show that firefighter injuries are reduced by increasing the number of firefighters from three to four per company. It would be difficult to determine just how much the number of firefighter injuries could be reduced with the implementation of NFPA 1710 because of the many factors that affect this. Varying current staffing levels in departments will have an impact on the amount of effect that the adoption of NFPA 1710 will have on individual departments.

Staffing has long been a controversial subject in the fire service, much because of the financial impact on local government’s budgets. Much of this information was known or written long before the implementation of NFPA 1710, however it is valuable and essential information in accessing NFPA 1710. I think it’s evident from this research that increased staffing plays a key role in reducing firefighter injuries on the fireground. Fire service leaders now have the responsibility of seeking to implement the provisions of NFPA 1710 in their own departments. It’s also apparent that NFPA 1710 goes farther than just recommending four man companies that respond within certain time frames. The standard also addresses policy issues such as implementation of incident management systems, safety programs, and communications facilities, all of which are critical to improving the safety of firefighters.

The organizational implications of these results are positive and beneficial to the Monroe Fire Department, it’s personnel, and the citizens served by Monroe. Implementation of NFPA 1710 will have a positive effect in that it will improve the quality of service in Monroe by adding additional firefighters on engine and ladder companies to respond to calls for assistance from the public. These calls for assistance will be answered with a quicker response time therefore
allowing firefighters an opportunity to save more property of a fire involved structure. The added benefits of possible lower insurance ratings and possible better economic development attraction with fire department accreditation status will also benefit the community and the department.

Fire chiefs must educate city managers and local elected officials to inform them of the benefits of NFPA 1710 to our communities, our citizens, and most importantly to our firefighters.

RECOMMENDATIONS

The following recommendations are based on the results of this research. These recommendations are fully supported by the data collected during this research and contained in this project. The purpose of this research project was to evaluate the effects of NFPA 1710 on the Monroe Fire Department and develop a plan to implement NFPA 1710 in Monroe. The following recommendations satisfy the above purpose. The recommendations are as follows:

• Develop and organizational statement in accordance with NFPA 1710.

• Follow the recommendations contained in the plan entitled “Implementation of NFPA 1710 in Monroe” provided in Appendix A of this project.

• Provide information to the elected officials and the general public in Monroe outlining the potential effects of NFPA 1710 on Monroe.

• Utilize the document provided by the IAFC entitled NFPA 1710: A Decision Guide to assist in making implementation decisions

• Implement a timeline for implementation as follows:
  • Make a decision regarding implementing NFPA 1710 by January 2002.

• Complete a quadrennial report for the period 2002-2005 disturbed to the Monroe City Council including areas not currently meeting the standard, predictable consequences of those deficiencies, and steps necessary to achieve compliance.

• Develop and analyze data to determine proper locations for future fire stations to continue to meet the recommendations of NFPA 1710 response guidelines.

• Evaluate and monitor the implementation process for the purpose of making any necessary modifications that may be necessary to effect an efficient implementation of the standard.

The recommendations also provide a solution to the original problem which was that the Monroe Fire Department needs to evaluate the effects of NFPA 1710 on the department and develop a plan to implement NFPA 1710.

It is the desire of this author for future readers and researchers to utilize these recommendations and research material to assist them in evaluating the potential effects of NFPA 1710 on their department and in developing a plan to implement NFPA 1710 in their department. Information contained in this report can be located from various sources as indicated in the reference pages or by contacting the author.
REFERENCES


Merrill, G. Lawerence (1990). *On-Call Fire Departments the Town Boards Responsibilities*. Michigan Townships Association


APPENDIX A

A Plan to Implement NFPA 1710 in Monroe

Purpose
To develop a plan to implement the National Fire Protection Association’s Standard 1710 in the Monroe Fire Department.

Scope
This plan will provide recommendations on providing education to various parties involved, implementation guidelines, and guidance for monitoring the implementation of the standard.

Recommendations
- Develop a team within the fire department to further evaluate the potential effects of NFPA 1710 and utilize this team to communicate the effects of the standard to other fire department employees.
- Develop an organizational statement in accordance with NFPA 1710.
- Provide a presentation to the City Manager on the potential effects of NFPA 1710 on the citizens of Monroe such as:
  - Quicker response times to citizen requests for assistance.
  - Potential for less property damage resulting from fire.
  - Possible lower insurance rates from increased staffing levels.
- Provide information to the City Manager, Risk Manager, and Human Resources Manager of the potential for reduced firefighter injury exposure due to increased staffing levels as provided in research.
• Develop and provide a joint presentation with the City Manager to the elected officials of Monroe outlining citizen and employee benefits of NFPA 1710.

• Utilize the “NFPA 1710; A Decision Guide” provided by the International Association of Fire Chiefs to assist in additional implementation decisions.

• Utilize current data and develop means of compiling additional data to analyze for determination of future fire station locations to best meet the response guidelines of NFPA 1710.

• Phase in additional staffing to provide recommended staffing on existing companies as follows:

  - Six additional firefighters in year one to increase staffing on the ladder/squad from two to four person staffing. (Continue to run these two apparatus together at this time.)
  - Three shift officers to serve as incident commanders in year one.
  - Twelve additional firefighters in year two to staff engine number four to be located in the north/west corridor area of the City.
  - Twelve additional firefighters in year three to staff engine number five to be located in the north annexation area of the City.
  - Nine additional firefighters in year four to increase staffing from three to four persons on the department’s three engines.
  - Six additional firefighters in year five to separately staff the ladder and squad with two separate four person crews to allow these apparatus to function independently of each other.
• Pursue building a sub-station in year two in the north/west area of the City where response times are longer than the recommendation of NFPA 1710.

• Pursue building a sub-station in year three in the planned north annexation area where response times are expected to be longer than those recommended in NFPA 1710.

• Monitor the implementation and progress of the NFPA 1710 and make modifications as necessary.

• Continue to evaluate potential effects and seek additional information relevant to the implementation of NFPA 1710 in Monroe and utilize new information to carry out implementation.

• Implement a timeline for implementation as follows:
  • Make a decision regarding implementing NFPA 1710 by January 2002.
  • Complete a quadrennial report for the period 2002-2005 disturbed to the Monroe City Council including areas not currently meeting the standard, predictable consequences of those deficiencies, and steps necessary to achieve compliance.