

**EXAMINING THE EFFECTS OF NFPA STANDARD 1710
ON LONGBOAT KEY FIRE-RESCUE**

STRATEGIC MANAGEMENT OF CHANGE

BY: Matthew T. Altman
Longboat Key Fire-Rescue
Longboat Key, Florida

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ABSTRACT

This research project examined the National Fire Protection Association (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* and its possible implications for Longboat Key Fire-Rescue (LKFR). The problem was to determine how much of the standard LKFR would be able to comply with. The purpose of this project was to determine what effect the adoption of NFPA 1710 would have on the operations of LKFR. The project used evaluative research to answer the following questions: 1) What are the advantages/disadvantages of NFPA 1710?, 2) How will other fire departments in Florida adopt NFPA 1710?, and 3) What are the possible effects of NFPA 1710 on current business practices of LKFR?

The procedures used included a literature review of NFPA 1710 in regards to those in support of and those against the standard. In addition, the standard itself was examined for relevant information. A questionnaire was also distributed to all career fire departments in Florida with 172 responding. A majority of respondents indicated meeting NFPA 1710's requirements in regards to response times for engine companies and medical response. Fewer were able to meet quint company and truck company response times. Departments in Florida were able to provide: staffing for attack lines, a dedicated incident commander, first responders with automated external defibrillators (AED's) and the ability of having mutual/automatic aid in a majority of incidents.

It was recommended that LKFR continue to gather data and study it to see if improvements in the critical areas of NFPA 1710 can take place. Further, an organizational statement which includes response times for all incidents, number of

personnel responded, types of equipment used and types of incidents responded to should be completed. A labor/management group consisting of operations officers, firefighters and the union district vice president should be convened to perform an internal evaluation of the department. This internal evaluation should examine staffing, response guidelines, incident command structure and mutual/automatic aid agreements. The study will be compiled into a report which should be forwarded to the Town Manager and Town Commission for their approval on any major initiatives of the standard.

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INTRODUCTION

In the past, national standards such as the National Fire Protection Association (NFPA) 1500 (1997) *Standard for Fire Department Occupational Safety and Health Program* have been difficult to achieve in full because of their complexity. NFPA 1710 (2001b) *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* has the same potential of being such a standard (J. Wakeham, personal communication, July 16, 2001). The problem for Longboat Key Fire-Rescue (LKFR) was to determine how much of the standard the department would be able to comply with.

The purpose of this applied research project was to determine what effect the adoption of NFPA 1710 (2001b) would have on the operations of LKFR. Evaluative research was used to answer the following questions:

- Question 1. What are the advantages/disadvantages of NFPA 1710?
- Question 2. How will other fire departments in Florida adopt NFPA 1710?
- Question 3. What are the possible effects of NFPA 1710 on current business practices of LKFR?

BACKGROUND AND SIGNIFICANCE

Longboat Key Fire-Rescue is a career fire department on the West Coast of Florida. The department consists of 30 line personnel with 10 per shift. Along with providing fire-rescue services, the department also has Advanced Life Support (ALS) transport capability via two full-time rescue vehicles. For the purpose of this paper, the term rescue for LKFR is synonymous with ambulance. The department has an average

response time to all incidents of 3.5 minutes (M. Monahan, personal conversation, December 4, 2001). As shown in Appendix A, LKFR receives mutual aid or automatic aid with an average response time of 15.25 minutes from the north and 14.17 minutes from the south (Longboat Key Fire-Rescue, 2001). The department operates a quint and rescue out of each station and there are two stations in the department. In general, the quint operates with a driver/operator only and the rescue with two personnel who are state-certified firefighters trained in emergency medical services (EMS). Depending on staffing, the quint can have an additional firefighter on board. In addition, one incident commander is on duty per shift.

NFPA 1710 (2001b) began to be crafted after a failed attempt to create one standard for both career and volunteer departments (proposed NFPA 1200 *Standard for Organization, Operation, Deployment and Evaluation of Public Fire Protection and Emergency Medical Services*) in 1995 (NFPA, p.2 & 9, 2001a). In 1997, work began on the creation of two separate standards, NFPA 1710 and 1720 (*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, 2001c) which would encompass “substantially all” career and volunteer departments, respectively. The NFPA Standards Council explained their decision in the following way (2001a):

Of the available approaches, the Council believes that the simplest and the one most conducive to success is to establish separate projects for the fully career and the fully volunteer services. In the view of the Council, this approach will ensure that both the career and the volunteer services have a real opportunity, if they so desire, to develop standards that meet their needs (p. 2).

NFPA 1710 (2001b), however, would face many hurdles before being finalized in July 2001. In May 2001, NFPA 1710 (2001b) was “recommended for issuance without amendment” after a vote of the NFPA membership (NFPA, p. 2, 2001a). Groups such as the National League of Cities and the International City/County Management Association (ICMA) had raised objections to the proposed standard (Primedia, 2001). Their reasons included a lack of local government’s ability to address staffing and response guidelines. Other groups such as the International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (ICHIEFS or IAFC) had strongly supported the standard for the staffing and response requirements. ICHIEFS President Mike Brown stated that NFPA 1710 (2001b) “... will help fire departments evaluate and improve service delivery within their communities (IAFF, p. 5, 2001a).” IAFF General President Harold Scheitberger said, “We have provided a plan for the future of our profession that will save the lives of civilians and fire fighters now and for generations to come (IAFF, p. 5, 2001a). However, not all fire service organizations supported the standard. The Southeastern Association of Fire Chiefs opposed the adoption of NFPA 1710 because of the lack of technical data, unrealistic response times and being an unfunded mandate (IAFC, 2001b). The Southeastern Association of Fire Chiefs is a section of ICHIEFS, but did not agree with supporting the standard.

In July 2001, a group known as the National Local Government and Taxpayer Coalition presented arguments to the NFPA Standards Council citing NFPA 1710’s (2001b) “rigid constraints and crushing financial burdens on local governments’ provision of fire and emergency services (Thomas, p. 1, 2001).” After reviewing the appeals, the NFPA

Standards Council issued a final ruling on July 17, 2001. The Council added an equivalency section (1.3) as follows:

Nothing in this standard is intended to prohibit the use of systems, methods, or approaches of equivalent or superior performance to those prescribed in this standard. Technical documentation shall be submitted to the Authority Having Jurisdiction (AHJ) to demonstrate equivalency (p. 8).

In essence, this allowed a local AHJ to continue to do what it was doing if it exceeded or met the standard, but not in the exact language of the standard. This was explained in the NFPA Standards Council decision dated July 13, 2001:

Particularly in the case of new and controversial documents such as those presented here, an equivalency statement provides those who wish to adopt and utilize the standard the means to consider and act on equivalencies provided that adequate technical substantiation and documentation can be developed (p. 8).

As of the date of this paper, NFPA 1710 (2001b) and 1720 (2001c) are in the NFPA's revision cycle and will be reported on during their 2004 Annual Meeting. While past NFPA standards have generated discussion, NFPA 1710 (2001b) is the "hot" topic for today's fire service. This standard will directly impact not only LKFR, but all career-service fire agencies in the United States. For this reason, it was a worthy topic to explore for LKFR. For example, this topic has been discussed in both quarterly labor/management and staff meetings at LKFR. It was evident that LKFR was in need of additional information on this new national standard.

This research is being conducted as a requirement of the National Fire Academy's Executive Fire Officer Program (EFOP). The problem addressed by this project related

to Module 2 in the Strategic Management of Change course titled *The Change Management Model* (National Fire Academy, 2001). This module discusses change and how it can affect an organization. NFPA 1710 (2001b) is one such driving force which will result in change in the fire service.

LITERATURE REVIEW

NFPA 1710 (2001b) is a relatively new standard and as such, little formal study has been done on it. According to the IAFF (2001b), “The new standard’s very focus is the protection of lives and property (p. 16).” The IAFF further sums up the main parts of NFPA 1710 (2001) in the following way (IAFF, 2001b):

Fire engine and truck staffing at a minimum of 4 fire fighters (5 or 6 in jurisdictions with tactical hazards and high-hazard occupancies).

Response time of 4 minutes for the arrival of a unit with First Responder or higher-level capability at emergency medical incidents and if provided, 8 minutes for the arrival of the ALS.

Minimum requirements for health and safety, incident management, training, communications, and pre-incident planning (p. 16).

Political Issues

NFPA 1710 (2001b) can be further examined by looking at the political issues surrounding the standard and the legal implications involved in the standard. Most of the debate in the standard occurs in the areas of staffing and response times as the literature indicates. This debate has split down labor/management lines. IAFF General President Harold Schaitberger responded in the following way (IAFF, 2001a):

Our critics have said this is just a union issue and that it is only about jobs. I say,

you're damn right it's about jobs. It's about jobs that will let us deliver more effective fire operations. It's about jobs that will allow our people to operate more safely. It's about jobs that are going to save our members lives (p. 14).

Interestingly, ICHIEFS, whose membership includes command level officers (i.e. management) actually worked in tandem to help get NFPA 1710 (2001b) passed (IAFC, 2001a). Because of their unique position of supporting the safety of the firefighter, while at the same time being part of management, command level officers found themselves in a difficult position politically. Bruno (2001b) wrote, "... ICHIEFS formed a powerful coalition with the IAFF to lead the fight that resulted in the NFPA standard being adopted... (p. 16)." Bruno states in his *Firehouse* article dated June 2001 that, "Other chiefs privately told of pressure being exerted on them by local officials to remain silent or oppose the standard (p. 16)."

There was opposition, however, from many groups representing municipal and county officials. Many officials from groups such as the National Association of Counties, the U.S. Conference of Mayors, the ICMA and others felt like they were excluded from the NFPA process and that staffing and response times should be left to local authorities (Bruno, 2001b). The Florida Fire Chiefs' Association (2001) said of the standard, "There clearly is no consensus on standard 1710, and the proposed standard is not scientifically-based (p. 1)."

Legal Issues

A good place to start to look at the legal issues involved in NFPA 1710 (2001b) is to concentrate on the standard itself. NFPA 1710 (2001b) covers "substantially all career" fire departments. For the purposes of this paper, that term indicates those departments

whose majority of members are career fire fighters. This term originated from the NFPA Standards Council (p. 15, 2001a). As mentioned previously, staffing and response times are a large part of the standard, but a third component, Emergency Medical Services (EMS), is another significant part. These are the areas the researcher will concentrate on.

NFPA 1710 (2001b), sections 4.1.2, 4.1.2.1, 4.1.2.1.3, and 4.1.2.1.4 state the following:

- 4.1.2 The fire department organizational statement shall include service delivery objectives.
- 4.1.2.1 These objectives shall include specific response time objectives for each major service component (i.e. fire suppression, EMS, special operations, aircraft rescue and fire fighting, marine rescue and fire fighting, and/or wildland fire fighting) and objectives for the percentage of responses that meet the response time objectives.
- 4.1.2.1.3 The fire department shall evaluate its level of service and deployment delivery and response time objectives on an annual basis. The evaluations shall be based on data relating to level of service, deployment, and the achievement of each response time objective in each geographic area within the jurisdiction of the fire department.
- 4.1.2.1.4 The fire department shall provide the AHJ with a written report, Quadrennially, which shall be based on the annual evaluations required by 4.1.2.1.3 (p. 6-7).

During a recent talk on NFPA 1710 (2001b), Chief Alan Brunicini of the Phoenix (Arizona) Fire Department indicated that an individual fire department may not be able to

meet all of the service delivery criteria. Chief Brunicini stressed that fire departments who are unable to meet all of the criteria should indicate such in their plan (personal communication, November 17, 2001).

As indicated in section 4.1.2.1 of NFPA 1710 (2001b) certain time and percentage objectives must be met. Section 4.1.2.1.1 (2) and (3) are key here and are as follows, respectively:

Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident.

Four minutes (240 seconds) or less for the arrival of a unit with first responder or higher level capability at an emergency medical incident (p. 6).

Further, the department must meet these objectives 90 percent of the time and perform an analysis annually (NFPA 1710, 2001b). In an article in *Fire Chief*, this is explained in the following way (Elliott, 2001): “In other words, a department can miss the four-minute mark on occasion, but it must make the eight-minute mark to comply (p. 10).” In a roundtable discussion with chief officers conducted by *Fire Engineering* magazine (Manning, 2000b), the general consensus was that the response times are reasonable to accomplish in most cases.

In regards to staffing, NFPA 1710 (2001b) requires that four personnel are on an engine company and four on a truck company with those numbers going to five or six if tactical hazards exist (Sections 5.2.2.1.1, 5.2.2.1.2, 5.2.2.2.1, and 5.2.2.2.2) in the jurisdiction. ICHIEFS President Mike Brown explains staffing for engine and truck companies as follows (ICHIEFS, 2001c):

We identified a mechanism that allows multiple vehicles to respond and still comply or you can use multiple station responses. You can use automatic and mutual aid agreements. We believe there is sufficient flexibility in 1710 to allow most career fire departments to significantly meet 1710's recommendations (p. 19).

For the initial full alarm, ICHIEFS in its *NFPA 1710: A Decision Guide* (2001c) listed the required numbers of personnel who must be on scene:

- 1 Incident commander
- 1 Min. 400 gpm uninterrupted water supply pump operator
- 2 Two handlines with combined 300 gpm flow and two personnel on each attack and backup line
- 1 Support person for each attack and backup line
- 2 For a search and rescue team
- 3 For ventilation team
- 3 Initial Rapid Intervention Crew (IRIC) of at least two personnel
- 1 If aerial device in use, one dedicated person for the turntable
- 1 One person as staff aide for supervisory chief officer

The above list represents a total of 16 on an initial full alarm assignment if an aerial is in operational use (p. 22).

For quint apparatus, section 5.2.2.4 of NFPA 1710 (2001b) is applicable. In general, this section mandates that staffing be sufficient to ensure safe operations while working in multiple, simultaneous situations. The *Fire Engineering* (Manning, 2000b) chief officers' panel that was interviewed indicated that meeting this requirement would not be a problem.

This area of NFPA 1710 (2001b) closely mirrors the Occupational Safety and Health Administration (OSHA) “2 In / 2 Out” (ICHIEFS, 1998) requirement and NFPA 1500 (1997) *Standard for Fire Department Occupational Safety and Health Programs*. Both of these programs also address having sufficient fire personnel on scene prior to operating in an immediately dangerous to life and health (IDLH) environment. While NFPA 1500 (1997) addresses what fire departments should do prior to an incident, as Chief Brunicini states, “1710 is for incidents underway (personal communication, November 17, 2001).” NFPA 1710 (2001b) requires that in providing EMS, fire departments must minimally have fire fighters trained to the first responder / Automated External Defibrillator (AED) level (Section 5.3.2.2). In section 5.3.3.4.2, these personnel must arrive within four minutes, 90 percent of the time. For ALS the response time is increased to eight minutes for the rescue company (p. 9). The standard requires that the following occurs in section 5.3.3.4.4:

Personnel deployed to ALS emergency responses shall include a minimum of two members trained at the emergency medical technician – paramedic level and two members trained at the emergency medical technician – basic level arriving on scene within the established response time (p. 9).

In the ICHIEFS *NFPA 1710: A Decision Guide* (2001c), it is noted that NFPA 1710 (2001b) “does not propose a transport staffing standard (p. 28).” As such, state law would supercede the requirements in NFPA 1710 (2001b) dealing with EMS (p.28). The *Fire Engineering* (Manning, 2000b) chief officer panel also believed that they either met or exceeded the requirement for provision of EMS.

As a final note on response times, section 4.1.2.1.1 (1) allows for “One minute (60 seconds) for turnout time (p.6).” This adds one additional minute to all of the previously mentioned response times for fire and EMS incidents.

NFPA 1710 (2001b) has requirements for those departments who provide the following services: special operations, airport rescue and fire-fighting (ARFF), marine rescue and fire-fighting (MRFF), wildland fire suppression, safety and health, and establishing an incident management system (IMS) (p. 9-12).

In summary, the reviewed literature showed that NFPA 1710 (2001b) is controversial. While government leaders have indicated that an unfunded mandate was being handed down, much of the fire service has appeared to have embraced the standard and seemed to be able to meet most of the criteria set forth in it.

PROCEDURES

Definition of Terms

Advanced Life Support (ALS). Functional provision of advanced airway management, including intubation, advanced cardiac monitoring, manual defibrillation, establishment and maintenance of intravenous access, and drug therapy (NFPA, p. 5, 2001b).

Aircraft Rescue and Fire Fighting. The fire-fighting actions taken to rescue persons and to control or extinguish fire involving, or adjacent to, aircraft on the ground (NFPA, p. 5, 2001b).

Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure (NFPA, p.4, 2001b).

Automatic Aid. A plan developed between two or more fire departments for immediate joint response on first alarms (NFPA, p. 4, 2001b).

Basic Life Support (BLS). Functional provision of patient assessment, including basic airway management; oxygen therapy; stabilization of spinal, musculo-skeletal, soft tissue, and shock injuries; stabilization of bleeding; and stabilization and intervention for sudden illness, poisoning and heat/cold injuries, childbirth, CPR, and automatic external defibrillator (AED) capability (NFPA, p. 6, 2001b).

Company. A group of members: (1) Under the direct supervision of an officer; (2) Trained and equipped to perform assigned tasks; (3) Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies; (4) Operating with one piece of fire apparatus (engine, ladder truck, elevating platform, quint, rescue, squad, ambulance) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer; (5) Arriving at the incident scene on fire apparatus (NFPA, p. 5, 2001b).

Emergency Medical Care. The provision of treatment to patients, including first aid, cardiopulmonary resuscitation, basic life support (EMT level), advanced life support (Paramedic level), and other medical procedures that occur prior to arrival at a hospital or other health care facility (NFPA, p. 5, 2001b).

Emergency Operations. Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene (NFPA, p. 5, 2001b).

First Responder (EMS). Functional provision of initial assessment (i.e., airway, breathing, and circulatory systems) and basic first-aid intervention, including CPR and automatic external defibrillator (AED) capability (NFPA, p. 5, 2001b).

Incident Management System (IMS). An organized system of roles, responsibilities, and standard operating procedures used to manage emergency operations (NFPA, p. 5, 2001b).

Initial Full Alarm Assignment. Those personnel, equipment, and resources ordinarily dispatched upon notification of a structural fire (NFPA, p. 5, 2001b).

Mutual Aid. Reciprocal assistance by emergency services under a prearranged plan (NFPA, p. 5, 2001b).

Quint Apparatus. A fire department emergency vehicle with a permanently mounted fire pump, a water tank, a hose storage area, an aerial device with a permanently mounted waterway, and a complement of ground ladders (NFPA, p. 5, 2001b).

Rapid Intervention Crew (RIC). A dedicated crew of fire fighters who are assigned for rapid deployment to rescue lost or trapped members (NFPA, p. 6, 2001b).

Response Time. The time that begins when units are en route to the emergency incident and ends when units arrive at the scene (NFPA, p. 6, 2001b).

Turnout Time. The time beginning when units acknowledge notification of the emergency to the beginning point of response time (NFPA, p. 6, 2001b).

Research Methodology

A literature review was conducted at the National Fire Academy's Learning Resource Center during the month of July 2001. Subsequently, over the next several months and after the final approval of NFPA 1710 (2001b) by the Standards Council, additional

articles were obtained. As such, there was a scarce amount of written material on the subject.

NFPA 1710 (2001b) provided much of the necessary legal information. The actual standard itself was made available by NFPA in October 2001.

A questionnaire was developed and sent to every career fire department in the State of Florida. The list of contact people and addresses was made available by the Florida Fire Chiefs' Association. The questionnaire can be found in Appendix B. A total of 244 questionnaires were sent via U.S. Mail on August 20, 2001. Respondents were given two weeks to return the questionnaire via self-addressed, stamped envelope. From the amount of returned questionnaires, 172 were found to have been filled out correctly for analyzation purposes. The questionnaire consisted of 15 questions designed to look at the major area of NFPA 1710 (2001b): response times, staffing, EMS, IMS, and several other services that fire departments provide.

Question #1 asked if the agency currently met the four minute response time for engine companies and/or eight minute response time for a first alarm 90 percent of the time. This was a yes or no answer.

Question # 2 asked if the agency currently met the requirement of four minutes or less for the arrival of a first response emergency medical unit. Yes or no were the choices.

Question # 3 asked the respondent if they had indicated no to either question # 1 or # 2 if their department intended on trying to meet the requirement. Yes or no were the choices.

Question # 4 asked about engine or quint companies. If the respondent's agency had these type companies, did they currently have a minimum of four personnel assigned to each unit. Yes, no, or not applicable were the choices.

Question # 5 asked if the department operated truck companies and if they had four personnel assigned to each truck. The same choices as question # 4 applied.

Question # 6 asked if the respondent's agency provides a single incident commander on every emergency scene. Respondents could only answer yes or no.

Question # 7 asked if the respondent's department placed two personnel on each attack line and on each backup line. Again, yes or no were the only choices.

Question # 8 asked if the respondent's department had mutual aid and/or automatic aid agreements. Yes or no were the choices.

Question # 9 asked about the EMS capabilities of the respondent's department. The question asked if the department provided, as a minimum, first responder with AED capability within four minutes to the scene 90 percent of the time. Yes or no were the given choices.

Question # 10 asked which of the following capabilities the respondent's department provided for EMS: first responder only, first responder with AED, BLS, ALS, transport, non- transport. The respondent was told to circle all that applied.

Question # 11 asked if the respondent's department provided the following services: ARFF, marine rescue and fire-fighting, wildland fire suppression, and special operations. The respondent could circle all that applied.

Question # 12 was similar to question # 11 with the same choices, but inquired as to whether the respondent's department had mutual aid or automatic aid agreements for these services.

Question # 13 asked if the respondent's organization had a form of health and safety system. Yes or no were the given choices.

Question # 14 asked which of the following the respondent's organization would try to meet in regards to NFPA 1710 (2001b): staffing, deployment (manning hose lines), EMS, wildland fire suppression, special operations, ARFF, marine rescue and fire-fighting. The respondent could circle all that applied.

Question # 15 asked if the respondent's agency would not try to meet NFPA 1710 (2001b) in regards to the services listed in question # 14. Again, any of the choices could be circled that applied.

Assumptions

It is assumed that respondents to this questionnaire had a knowledge of NFPA 1710 (2001b) and were able to answer the questions appropriately. Further, that departments in the state provided a variety of services.

Limitations

Because of time constraints and the delayed release of NFPA 1710 (2001b) by the NFPA, a draft copy of the standard was used to develop the questionnaire. To the best of the researcher's knowledge, the only comprehensive list of departments available in Florida was from the Florida Fire Chiefs' Association. However, as some of the unusable questionnaires indicated, some departments on this list were predominantly volunteer agencies. As noted previously, there existed very little in the way of research or literature

in regards to NFPA 1710 (2001b) because of the standard's newness. Also, not every element in NFPA 1710 (2001b) was examined by the questionnaire. As such, it was limited to the main topics covered. Future questionnaires could capture more demographic data.

RESULTS

Answers to Research Questions

Research Question 1. What are the advantages/disadvantages of NFPA 1710? As the literature indicated, the advantages or disadvantages of NFPA 1710 (2001b) vary on whom you talk to. In some cases, a particular item may be an advantage and disadvantage at the same time.

Proponents of the standard emphasize that minimum staffing levels will benefit not only the fire fighter, but the fire service as a whole. In a study done by the Office of the Fire Marshal of Ontario (1993), minimum staff levels were extensively tested to determine what would be necessary on the fire ground. A minimum number of ten was found to be needed on an initial attack. This did not include some elements that are found in NFPA 1710 (2001b) such as a rapid intervention crew and support personnel for the hose lines.

In the Phoenix, Arizona recommendation of 1991, a compliment of 15 personnel was found to be necessary for an initial alarm of a structure fire. The IAFF (1995) studied staffing levels of fire departments and the correlation to safety and effective firefighting. This report advocated 15 to 16 personnel to operate safely and efficiently on the fire ground (p. 28). In this particular study, very similar language to NFPA 1710 (2001b) in regards to staffing can be found.

The ICHIEFS' Assistant Executive Director, Brian Johnson, said of NFPA 1710 (2001b) in a January 2001 *Firehouse* article, "It's going to raise the level of service and provide a tool for fire chiefs to justify their staffing at a time when local governments are hacking away at budgets (p. 14)."

Bruno (2001c) said the following regarding the staffing requirements:

Contrary to what opponents say about the lack of scientific research, these recommendations are based on the experience of veteran fire chiefs and supported by every manpower and response study that has been conducted in the last 25 years (p. 20).

Bruno (2001b) also said the following about NFPA 1710 (2001b):

Supporters of the measure hailed it as a breakthrough that will have a positive, long-range impact on career departments. In their view, it will lead to better fire and emergency protection for the public and improved firefighter health and safety. They also see it as a tool to reverse a 20-year trend in which local governments have been saving money by imposing budget cuts on their fire departments that eliminated stations and reduced company staffing to dangerous levels (p. 16).

Another advantage of NFPA 1710 (2001b) is that for the first time the fire service and not outside agencies is setting the goal at which their departments should strive for in regards to operations (Bruno, 2001b).

In the IAFF study (1995), response times and ALS response to emergency medical calls were identical to the recommendations in NFPA 1710 (2001b). Manning (2001c) calls NFPA 1710 (2001b) "The new "Accountability" standard (p. 4)." "By participating in the development of this standard, ICHIEFS ensured that NFPA 1710 allows enough

flexibility with regard to staffing, deployment and response times so the standard can be used by everyone as a common benchmark (Primedia, p. 2, 2001).”

The main disadvantage of NFPA 1710 (2001b) is that some jurisdictions may find it difficult to achieve full compliance with the standard. Chief Brunicini said during a recent conference, “Immediate compliance with a new NFPA standard has never been the expectation, nor the reality (personal communication, November 17, 2001).” He further stated that “The committee did not have as a goal the development of a standard that everyone could meet and rejected making 1710 a ‘recommended practice’ (personal communication, November 17, 2001).”

Departments such as Klamath County (Oregon) Fire District # 1 (2001) have chosen to develop their own deployment process based on an alternative to NFPA 1710 (2001b). This is allowed under the provisions set forth in NFPA 1710 (2001b). NFPA in its final decision by the Standards Council on NFPA 1710 (2001b) stated, “The Council would merely note that jurisdictions which believe that NFPA 1710 is not appropriate to its local circumstances are free to decline to adopt it (p. 7).”

National, state, and local officials feel that NFPA 1710 (2001b) is an “unfunded mandate” being imposed on them as indicated in this Florida Fire Chiefs’ update (2001), “NFPA 1710 undermines local variations in geography, topography, fiscal capacity, population density, and diversity of structures within a community (p. 1).”

In an article by Manning (2000a), the author concurs that “National standards most certainly are an intrusion into local jurisdictions (p. 2).” Donald J. Borot, Executive Director of the National League of Cities (Bruno, 2001c) said that, “we’re being told to

do something without providing the funds to do it (p. 20).” Bruno (2001c) sums up the sentiment of government officials in the following way:

They charge that it infringes on the right and responsibility of local elected officials to set their own standards for fire and emergency medical protection and that a “one-size-fits-all” national standard is unworkable and not supported by any scientific data. Perhaps their greatest fear is that failure to comply will make them vulnerable to lawsuits in the aftermath of serious fires (p. 20).”

Research Question 2. How will other fire departments in Florida adopt NFPA 1710?

Almost 57% or 98 respondents stated that their department either currently meets the four minute response time for engine companies and/or eight minute response time for a first alarm 90% of the time.

In regards to first response on medical calls, 87 or 51% indicated meeting the four minute or less arrival criteria.

When asked if they had answered no to either previous question, would they intend on trying to meet the requirement, 60 or 35% answered yes.

If operating quint or engine companies, respondents were asked if they have a minimum of four personnel assigned to each unit. Only 31 or 18% answered yes to this question.

For departments with truck companies and the requirement of four personnel, 14 or 8% indicated having the necessary amount of people on board.

A large majority, 131 or 76% of respondents stated having an incident commander on every emergency scene. This also is a requirement under NFPA 1500 (1997).

For backup and attack lines, 130 or 76% meet the requirement of two personnel on each line.

By far, the largest percentage of respondents, 99% or 171 stated having either mutual aid and/or automatic aid agreements in place.

For EMS responses and meeting the first responder with AED criteria within four minutes 90 percent of the time, 105 or 61% said yes they meet this.

Of the departments responding, 95 or 55% provide ALS care, 40 or 23% BLS care, 27 or 16% first responder with AED, 6 or 3% just first responder and 4 or 2% provide no EMS service.

In regards to any special services: ARFF, wildland fire suppression, marine rescue and fire-fighting, and special operations, the most frequently circled choice was wildland fire suppression. This could be because of Florida's continual wildland fire problem over the last several years.

When asked about any mutual aid or automatic aid for the previously listed services, the most frequent choice was special operations (119) followed by wildland fire suppression (112).

Another question mandated by NFPA 1500 (1997) as well, asked if the respondent's department has some form of health and safety system in place. Overwhelmingly, 146 or 85% stated yes.

The final two questions of the survey instrument asked which of the following the respondent's department would and would not (respectively) try to meet: staffing, deployment, EMS, wildland fire suppression, special operations, ARFF, marine rescue and fire-fighting. Deployment (125) followed by staffing (112) were the areas

departments will try to meet. ARFF (72) and interestingly, staffing (66) were the two largest areas that departments will be unable to meet. Further study needs to be performed to see if the departments who answered this question have a need to provide the given service or simply cannot meet the standard's requirements.

The totals for each question on the questionnaire can be found in Appendix C. The final area of the survey asked for any further comments from the respondent. Those comments can be found in Appendix D.

Research Question 3. What are the possible effects of NFPA 1710 on current business practices of LKFR? There is no question that NFPA 1710 (2001b) will have an impact on how LKFR operated in the future. According to the ICHIEFS *NFPA 1710: A Decision Guide* (2001c):

NFPA standards are among those that would be cited as representative of a fire service standard of behavior, so if the local fire department's own standard was different – or, as is more often the case, the local department had no standard – the injured person would argue that a relevant NFPA standard should be admitted into evidence so the jury can “benchmark” the fire department's act or omission against the relevant NFPA standard to help it make a decision (p. 17).

Further, NFPA 1710 (2001b) could be adopted by OSHA and made a general duty standard (ICHIEFS, p. 18, 2001c). If this were to occur, it may become a legal requirement as opposed to a recommendation. This is very similar to what OSHA did with NFPA 1500 prior to its own “2 – In/2 – Out” rule (ICHIEFS, p.18, 2001c). In Florida, this could lead to becoming a state law. Accordingly, LKFR would have to comply.

ICHIEFS recommends that if a department determines that NFPA 1710 (2001b) applies to them to start planning immediately (p. 18, 2001c). In summary, the following applies to LKFR and many departments (ICHIEFS, 2001c):

NFPA 1710 envisions implementation as a multi-year process. Even for those departments that adopt 1710 immediately, the first required report about implementation wouldn't be due to the AHJ until early in 2006.

Remember, *implementation* of NFPA 1710 does not require *adoption* of NFPA 1710.

It is not necessary, and for legal reasons, may not be advisable, for any department, city, county, district or town to formally "adopt" NFPA 1710 (p. 11).

DISCUSSION

As the questionnaire indicated, 57% of the respondents statewide are meeting NFPA 1710's (2001b) four minute response time for engine companies and/or eight minute response time for a first alarm 90 percent of the time (Section 5.2.3.1.1). This coincides with the information from the *Fire Engineering* chiefs' roundtable (Manning, 2000b). However, according to Bruno (2001b), it does indicate that possibly elected officials concerns regarding leaving response times and staffing criteria to local authorities may be premature.

For EMS, the questionnaire showed that a slight majority (51%) are able to meet the four minute or less first response. 61% indicated meeting the first responder with AED criteria within four minutes 90 percent of the time (NFPA, sections 5.3.2.2 and 5.3.3.4.2, 2001b). In addition, statewide, 55% of the EMS care provided is at the ALS level. This ALS level of service far exceeds the requirements set forth in section 5.3.3.4.4 of NFPA 1710 (2001b).

In reference to staffing, quint or engine company staffing of a minimum of four personnel was only being achieved by 18% of the respondents. For truck companies having the same requirement, only 8% were meeting the standard. Clearly, this is an area for improvement in regards to the requirements of the standard. As Brown (ICHIEFS, 2001c) had said, there are many ways to achieve compliance via mutual aid, automatic aid or multi-station or unit response. It is possible that the respondents were not aware of this provision.

For attack and backup line staffing, 76% have two personnel per line. This follows not only NFPA 1710 (2001b), but sections of NFPA 1500 (1997) dealing with operating in an IDLH environment. In addition, 76% answered that an incident commander was present on scene and 85% have a health and safety program. These are also requirements of NFPA 1500 (1997). Interestingly, NFPA 1500 (1997) was controversial when it first came out, but appears to have two significant areas being met by Florida fire departments.

By far the most surprising result of the questionnaire was that 99% of those answering stated having either mutual aid and/or automatic aid in place. This allows departments the ability to get the necessary levels of staff in place in the standard's required time frames without having to add additional personnel. ICHIEFS President Brown makes this clear (2001c), "NFPA 1710 does NOT require four people on every piece of apparatus (p. 19)."

It was found that Florida departments will try to meet deployment followed by the staffing requirements of NFPA 1710 (2001b). Conversely, ARFF and staffing are the two largest areas that they will not try to achieve. This goes along with Chief Brunicini's

feeling that no one can comply totally (personal communication, November 17, 2001). As such, those areas would be identified in the individual department's plan as areas difficult to meet.

The questionnaire's results, as well as the literature review, have meaning for LKFR. LKFR operates two quint pieces of apparatus. The standard staffing is one driver/operator and occasionally, a second person. This falls well below NFPA 1710's (2001b) requirement and coincides with the questionnaire. This is a situation worthy of further study from a safety and effectiveness standpoint. Other staffing issues such as providing an incident commander and ALS level of care is consistently being achieved by LKFR. LKFR also has in place both automatic and mutual aid agreements (See Appendix A) which provide additional personnel. Further, LKFR has a health and safety program consistent with NFPA 1500 (1997).

Because NFPA 1710 (2001b) has been issued and published for such a short period of time, it may be years before all the legal implications of it are realized. Therefore, additional studies will need to be done on both the primary areas of the standard, as well as, the areas not largely discussed in this project such as: training, systems and communications systems (Sections 6.3 and 6.4).

RECOMMENDATIONS

It is recommended that LKFR continue to gather data in regards to: response times for all incidents, number of personnel responding, number of equipment responding, types of equipment responding, and types of incidents responding to. These data will become part of the organizational statement that should be written. Currently, this does not exist for LKFR.

Further, it is recommended that any type of study in regards to NFPA 1710 (2001b) be conducted by a group consisting of both labor and management. It is recommended that the LKFR chief obtain the sanction of the Town Manager prior to this evaluation. This will help to alleviate any potential difficulties if/and when implementation of NFPA 1710 (2001b) occurs.

As NFPA 1710 (2001b) indicates, an annual internal evaluation on all relevant data should occur. A labor/management team consisting of operations officers, firefighters and the union district vice president should be assembled to produce a package for the chief's approval. Based on this information, a recommended operating guideline (ROG) should be drafted including the following: staffing, response guidelines, incident command structure and mutual/automatic aid agreements.

At this time, it is not recommended for LKFR to formally adopt NFPA 1710 (2001b) until after analysis of the data from the internal evaluation. This will allow LKFR to determine what parts of NFPA 1710 (2001b) it can or cannot meet. In addition, areas found during the initial evaluation to be deficient should be formally presented to the Town Manager in the form of a written report. Pursuant to NFPA 1710 (2001b), the AHJ or in the case of Longboat Key, the Town Commission, will be charged with final approval of any major initiatives to comply with the standard. Further, other fire departments nationwide should conduct their own studies on NFPA 1710 (2001b). They are urged to re-examine the areas covered by this researcher and those sections in the standard which were not covered within the scope of this study.

REFERENCES

- Bruno, H. (2001a, January). Labor and management cooperate on NFPA 1710 staffing standard. *Firehouse*, 14.
- Bruno, H. (2001b, June). NFPA approves 1710 standard for staffing career units. *Firehouse*, 16.
- Bruno, H. (2001c, July). NFPA 1710: the fight's not over. *Firehouse*, 20.
- Elliott, T. (2001, August). NFPA 1710: facts, fallacies and fallout. *Fire Chief*, 8-10.
- Florida Fire Chiefs' Association. (2001, May 22). NFPA gives initial approval to new deployment standard in face of city opposition. Ormond Beach, FL: Author.
- ICHIEFS. (1998, October). IAFF/IAFC 2 in/2 out questions and answers. *ICHIEFS*. Retrieved September 28, 2000 (Goldfeder, B.) from the World Wide Web: <http://www.ichiefs.org/media/2i20qa.htm>.
- International Association of Fire Chiefs. (2001a, June 15). NFPA 1710, 1720 pass in Anaheim: Standards Council will review in July. *ICHIEFS ON SCENE*, 15, 1 and 5.
- International Association of Fire Chiefs. (2001b, July 1). Southeastern Association of Fire Chiefs oppose 1710. *ICHIEFS ON SCENE*, 15, 3.
- International Association of Fire Chiefs. (2001c, September). *NFPA 1710: a decision guide*. Fairfax, VA: Author.
- International Association of Fire Fighters. (1995). *Safe fire fighter staffing: critical considerations*. Washington, D.C.: Author.
- International Association of Fire Fighters. (2001a, May-June). IAFF wins approval of NFPA 1710 standard. *International Fire Fighter*, 84, 1 and 14.

International Association of Fire Fighters. (2001b, July-August). Historic victory: NFPA 1710 standard approved. *International Fire Fighter*, 84, 1 and 16.

Klamath County (OR) Fire District No. 1. (2001). *Klamath County Fire District No. 1 deployment process*. Klamath County, OR: Author.

Longboat Key Fire-Rescue. (2001, May). *Mutual aid mileage and estimated response time to mid-key*. Longboat Key, FL: Author.

Manning, B. (2000a, October). A tale of two standards. *Fire Engineering*, 4.

Manning, B. (2000b, November). Roundtable – opinions from around the country. *Fire Engineering*, 22+.

Manning, B. (2001c, August). NFPA 1710: the new “accountability” standard. *Fire Engineering*, 4.

National Fire Academy. (2001). *Strategic Management of Change*. Emmitsburg, MD: Author.

National Fire Protection Association. (1997, August). *NFPA 1500 Standard for fire department occupational safety and health program*. Quincy, MA: Author.

National Fire Protection Association. (2001a, July). *Standards council decision (long form), D# 01-11*. Quincy, MA: Author.

National Fire Protection Association. (2001b, August). *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*. Quincy, MA: Author.

National Fire Protection Association. (2001c, August). *NFPA 1720 Standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by volunteer fire departments*. Quincy, MA: Author.

Office of the Fire Marshal of Ontario. (1993). *Fire ground staffing and delivery systems within a comprehensive fire safety effectiveness model*. Ontario, Canada: Author.

Phoenix (Arizona) Fire Department. (n.d.). *FIRECAP benchmark structure fire*. Phoenix, AZ: Author.

Primedia. (2001, February). Why ICHIEFS supports the NFPA 1710 standard. *IndustryClick Corporation*. Retrieved August 26, 2001 from the World Wide Web: <http://industryclick.com>.

Thomas, J. (2001, July 27). Fire and EMS deployment standards approved by NFPA standards. *Florida League of Cities Alert*, 1-2.

APPENDIX A

MUTUAL AID MILEAGE AND ESTIMATED RESPONSE TIME TO MID-KEY

MANATEE:

Station	Location	Miles	Est. Response Time*
WMFR#1	Holmes Beach	10.1	16.0 minutes
WMFR#3	Cortez Road	9.0	14.5 minutes

SARASOTA:

Station	Location	Miles	Est. ResponseTime*
SCFD#3	Lido Key	6.3	10.5 minutes
SCFD#1	4th Street	9.7	15.5 minutes
SCFD#2	Waldemere St.	10.5	16.5 minutes

* Estimated Response Time includes 1 additional minute to allow for mutual aid request and subsequent dispatch of requested units responding at 40 mph.

APPENDIX B

Questionnaire Regarding Implementation of NFPA 1710

1. Does your agency currently meet the four minute response time for engine companies and/or eight minute response time for a first alarm 90 percent of the time? Yes No

2. Does your agency currently meet the requirement of four minutes or less for the arrival of a first response emergency medical unit? Yes No

3. If you answered NO to either Question 1 or 2, does your department intend on trying to meet this requirement? Yes No

4. If your agency operates engine or quint companies, do you currently have a minimum of four personnel assigned to each engine? Yes No

5. If your agency operates truck companies, do you currently have a minimum of four personnel assigned to each truck? Yes No N/A

6. Does your agency currently provide a single incident commander on every emergency scene?
 Yes No

7. Do you currently have two personnel on each attack line and on each backup line?
 Yes No

8. Do you currently have in place mutual aid agreements and/or automatic aid agreements?
 Yes No

9. During EMS responses, do you provide, at a minimum, first responder with AED capability within four minutes to the scene 90 percent of the time? Yes No

10. Which of the following describes the capability of your department to provide EMS? (circle all that apply)

First Responder only	BLS	Transport
First Responder with AED	ALS	Non-Transport

11. Does your agency provide the following services?

ARFF	Wildland Fire Suppression
Marine Rescue and Fire-Fighting	Special Operations

12. Which of the following does your agency have mutual aid or automatic aid agreements for?

ARFF

Wildland Fire Suppression

Marine Rescue and Fire-Fighting

Special Operations

13. Does your agency have some form of a health and safety system in place for your firefighters? Yes No

14. Which of the following areas related to NFPA 1710 will your department try to meet? (circle all that apply)

Staffing

Special Operations

Deployment (manning hose lines)

ARFF

EMS

Marine Rescue and Fire-Fighting

Wildland Fire Suppression

15. Which of the following areas related to NFPA 1710 will your department be **unable** to meet? (circle all that apply)

Staffing

Special Operations

Deployment (manning hose lines)

ARFF

EMS

Marine Rescue and Fire-Fighting

Wildland Fire Suppression

This concludes the questionnaire. Please feel free to include any additional comments below.

Thank you very much for your assistance in completing the questionnaire.

Please note: Questionnaire size reduced.

APPENDIX C

Questionnaire Regarding Implementation of NFPA 1710

1. Does your agency currently meet the four minute response time for engine companies and/or eight minute response time for a first alarm 90 percent of the time? 98 Yes 73 No 1 N/A
2. Does your agency currently meet the requirement of four minutes or less for the arrival of a first response emergency medical unit? 87 Yes 78 No 7 N/A
3. If you answered NO to either Question 1 or 2, does your department intend on trying to meet this requirement? 60 Yes 32 No 80 N/A
4. If your agency operates engine or quint companies, do you currently have a minimum of four personnel assigned to each engine? 31 Yes 141 No
5. If your agency operates truck companies, do you currently have a minimum of four personnel assigned to each truck? 14 Yes 99 No 59 N/A
6. Does your agency currently provide a single incident commander on every emergency scene? 131 Yes 39 No 2 N/A
7. Do you currently have two personnel on each attack line and on each backup line? 130 Yes 41 No 1 N/A
8. Do you currently have in place mutual aid agreements and/or automatic aid agreements? 171 Yes 1 No
9. During EMS responses, do you provide, at a minimum, first responder with AED capability within four minutes to the scene 90 percent of the time? 105 Yes 58 No 9 N/A
10. Which of the following describes the capability of your department to provide EMS? (circle all that apply)

6 First Responder only	40 BLS	58 Transport
27 First Responder with AED	95 ALS	62 Non-Transport
11. Does your agency provide the following services?

27 ARFF	108 Wildland Fire Suppression
56 Marine Rescue and Fire-Fighting	79 Special Operations
30 N/A	

12. Which of the following does your agency have mutual aid or automatic aid agreements for?

40 ARFF	112 Wildland Fire Suppression
63 Marine Rescue and Fire-Fighting	119 Special Operations
23 N/A	

13. Does your agency have some form of a health and safety system in place for your

firefighters? 146 Yes 20 No 6 N/A

14. Which of the following areas related to NFPA 1710 will your department try to meet? (circle all that apply)

112 Staffing	52 Special Operations
125 Deployment (manning hose lines)	22 ARFF
97 EMS	37 Marine Rescue and Fire-Fighting
58 Wildland Fire Suppression	23 N/A

15. Which of the following areas related to NFPA 1710 will your department be **unable** to meet? (circle all that apply)

66 Staffing	59 Special Operations
24 Deployment (manning hose lines)	72 ARFF
34 EMS	65 Marine Rescue and Fire-Fighting
40 Wildland Fire Suppression	50 N/A

This concludes the questionnaire. Please feel free to include any additional comments below.

Thank you very much for your assistance in completing the questionnaire.

Please note: The category N/A for not applicable or not answered was added for statistical purposes. Questionnaire size reduced.

APPENDIX D

Comments regarding NFPA 1710 from respondents to the questionnaire.

“Department currently reviewing standard to determine what level of compliance we will attempt.”

“We’re going to conduct a specific evaluation of our compliance to determine alternatives and costs for working towards compliance or at least be able to advise the AHJ of our level for policy decisions as to appropriate levels of service for our jurisdiction.”

“The 1710 standard should have included population sizes as the threshold for a certain level of service. 0-25,000; 25,000 to 50,000; 50,000 to 100,000 etc. Rural and urban sizes by demography should have been considered in the standard. Basically, **ONE SIZE DOES NOT FIT ALL.**”

“I just hope that funding for implementation will come from NFPA for those communities that do not have the tax base to support it.”

“1710 has taken away the home rule of most small fire departments. The way in which the vote was taken is an injustice to all the smaller NFPA member departments. There has to be a better voting system online perhaps. This issue is far from over.”

“We will not be using 1710 as a guide but as a goal to one day meet. No agency should or can meet these areas. It will take time for small departments to be able to get there and it will take more revenue to do it than what can be done by taxes.”

“Based upon the revisions by the Standards Council of NFPA we will be able to provide documentation to justify our system.”