Confirming the need for an up to date pre-fire planning program for Boca Raton Fire Rescue Services

Leading Community Risk Reduction

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CERTIFICATION STATEMENT

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

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Abstract

The problem was that Boca Raton Fire Rescue Services (BRFRS) does not utilize a formal pre-fire planning program. One of the most critical issues facing the fire service today is the lack of pre-incident planning.

The purpose of this applied research project was to clarify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning. This paper used descriptive research methodology; four research questions were developed to answer these questions:

1. What is the definition of pre-fire planning and what are the advantages related with pre-fire planning?
2. How are other fire departments performing pre-fire planning?
3. What new technology is available for pre-fire planning?
4. What elements do members of the BRFRS desire in such a program so they will readily utilize it?

The procedures utilized for this applied research project consisted of a literature review, and two surveys. An external survey was sent to 248 fire departments in the State of Florida. This survey was designed to identify how those departments were performing pre-planning. An internal survey was administered to the uniformed personnel of BRFRS. This survey was developed to identify what elements BRFRS personnel desired in a pre-plan program.

Results of the literature review and the surveys indicated the need for a pre-plan program. The results also proved that once a pre-plan is created it must be easily accessible, understood and updated on a continual basis.

Recommendations included implementation of a formal Pre-Plan Program, utilizing NFPA 1620 as the standard, establish a Pre-Plan Development committee, conduct further research, install plans on all apparatus computers with print capabilities, provide training, and constantly reevaluate and update.

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Introduction

The problem is that Boca Raton Fire Rescue Services (BRFRS) does not presently make use of a formal pre-fire planning program. The fire service today has progressed into a more proactive, rather than a reactive organization in many facets. According to Terpak (2002) "waiting to gather information until the fire department arrives at an incident often proves to be reactive, unprofessional, and unproductive" (p. 69).

Like many Fire Departments throughout the country, Boca Raton's pre-fire planning program has not evolved as an effective, up to date tool that meets the needs of the department and community. "The better our planning is prior to an emergency response, the better we will be able to direct our resources toward ensuring an efficient operation" (Cotreau, 1994, p. 49). BRFRS relies on an antiquated process of completing, and accessing pre-fire plans. To place employees into the position of an incident commander without the proper knowledge or information of the building is a disservice to the employee, their co-workers and the citizens they serve. According to Massey (2004) "without a pre-plan, the chief will be forced to make critical life-and-death decisions based on guesswork and that can prove disastrous" (p. 102). Feagley (1992) wrote "Preplans are not secret documents and should be made available so that all firefighters can review time at any time; they are not documents just for chief officers" (p. 119).

The fire service across the nation has faced many challenges and changes to its profession over the years. "The organization that is emerging today, on the other hand, offers diverse fire protection services and requires a complex, multifaceted delivery system" (Coleman & Granito, 1988, p. 55). "The lack of pre-fire planning has claimed the lives of many fire service professionals in the recent past. Today's fire service managers must use pre-fire planning to serve as a safety net

when managing the modern fireground" (Sendelbach, 2004, Lesson #1 Preparation/Planning Section, ¶ 1).

> Pre-incident planning isn't just a nice thing to do. The instructor's guide for the National Fire Academy course book "*Managing Company Tactical Operations: Preparation*" says this: "No one would go to a doctor who performed surgery on patients if that doctor did not gather in formation on the patient's condition, pains, general health, etc., and then make a very educated prediction that a specific operation was actually needed. Yet, fire officers are most often found at the 'operating table' without an adequate 'patient history' regarding the structure and contents involved in the incident… Fire departments that use pre-incident preparation are the true professionals in this business." (Beck, 1993, p. 132)

The purpose of this applied research project (ARP) is to clarify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning. In conducting this research, four research questions were developed to help lead the author in discovering these ways. This paper will use descriptive research methodology in an attempt to answer the following research questions:

1. What is the definition of pre-fire planning and what are the advantages related with pre-fire planning?
2. How are other fire departments performing pre-fire planning?
3. What new technology is available for pre-fire planning?
4. What elements do members of the BRFRS desire in such a program so they will readily utilize it?

Background and Significance

Serving the ocean side community of Boca Raton, Florida, BRFRS provides a full array of emergency and non-emergency functions. The city of Boca Raton is the second largest municipality in Palm Beach County. Boca Raton has a year round population of 80,000 that inflates to approximately 125,000 during the winter months. Boca Raton has eight fire stations that provide emergency services within the city's 27 square miles. These services include, but are not limited to: fire suppression, paramedic level emergency medical services, tactical rescue, hazardous materials incident mitigation, pre-construction fire safety plans review, fire safety inspections, fire investigations, and community health and public fire safety education, along with Community Emergency Response Training (CERT). A staff of 200 employees provides emergency operations and staff support functions. Approximately 145 personnel are certified paramedics, the remaining are certified emergency medical technicians (EMT). BRFRS operates 4 Advanced Life Support (ALS) Engine companies, 2 ALS Ladder Companies, 8 ALS Rescue Units, 2 Brush Trucks and 1 Special Operations Vehicle.

In the past, BRFRS was able to accomplish building surveys and pre-fire plans. Building surveys were conducted on all commercial, industrial, mercantile, public assembly, and multi-family buildings, that had a fire alarm system installed. The building survey was an informal walk thru of the building. The information contained in the survey was general building construction, fire protection features and their location, water supplies, building hazards, and utilities and their locations. The building survey also included a drawing of the building with locations of information noted earlier. Pre-fire plans were performed on only a select few target hazards. Some of the target hazards included the Boca Raton Hotel & Club, Boca Raton Community Hospital and all their related buildings. The pre-fire plans contained all the same information as building surveys

and in addition they also included some tactical information as in apparatus positioning. Both the building surveys and pre-fire plans were updated every other year.

The building surveys were carried on all fire apparatus in the cab next to the Lieutenant in a blue three ring binder. This binder contained the surveys on 8 ½ by 11 inch pieces of paper. On one side of the paper was the information about the building and the other was the drawing. All fire apparatus only carried the surveys for their first due area. Unfortunately, if any unit would respond outside of it's first due area, as the first in unit, they would not have any information for that building. A blank copy of this survey is located in Appendix A.

The pre-fire plans are also carried in the cab of the fire apparatus in a separate green three ring binder. These binders contain only 15 pre-plans and are not as large as the building survey binder. The difference between a building survey and pre-plan is that the pre-plan includes tactical locations for arriving units. A copy of one of BRFRS's pre-plans is included in Appendix B.

As the city has grown so have the services provided and the amount of emergency calls handled. Brunacini (1999) talks about the crucial mission of delivering the best possible service to the customer as the main priority of the fire service (p. iii). One way this has been provided was with emergency medical services. BRFRS started transporting all patients from ALS and BLS medical calls to the hospitals. In the past a private ambulance company would transport the patient to the hospital. This change would take time from performing building surveys and pre-fire plans. Another change would be the increase in the amount and type of training. Training issues became paramount in the fire service. Between the need for specialized training like paramedic, EMT, hazardous materials, confined space, and not to overlook the basics of firefighting, these too would take time away from conducting pre-fire plans and surveys.

Currently BRFRS still carries the three ring binders on all fire apparatus, the only change is that the binders are large and cumbersome. This makes it hard to retrieve the information while responding to an emergency call. The building survey binder even now only carries the information for the first due run area. The pre-plan binder carries the same 15 plans in all books on all fire apparatus. BRFRS has not updated the information on the surveys for over four years, in addition new buildings have been built and no survey has been completed.

Recently, in the past two years the City has annexed two areas into the city. Several large businesses that included a large mall and a huge assisted living/nursing home facility were in these areas. BRFRS put together an annexation team that put together another separate three ring binder that contained pre-plans for these annexation areas. No other pre-fire plans or building surveys were updated or completed.

In the future BRFRS is looking to utilize the current touch screen laptops that are installed on all apparatus. The department might look into a more user-friendly software program that is compatible with our current CAD program. Additionally, the department will also need to look at portable printers mounted on the apparatus so the information will be able to be utilized on scene, by not only our personnel but also incoming mutual aid companies. As the needs of society increase, so do the needs and abilities of the fire departments. “While getting there fast is one thing, knowing what you got when you get there is something else” (Kalman, 1993, p. 45).

In the past, present and near future BRFRS has relied on the use of three ring binders to carry all the information for building surveys and pre-fire plans. As the City has grown so have the size of these binders. In his article Smith (1998) discusses how many different ways there are in gathering and saving this data, and how during emergency responses it must be easily obtained or the plans will be of no use (p. 18). With the current size of these binders the information is not

easily obtained. In an article titled *Preplanning Building Hazards* Brannigan (2000) stated the following:

> There are many fire departments that have potential major disasters in their jurisdictions… These potential disasters should be thoroughly preplanned. The information must be retrievable at the fire, not buried in a file. The goal should be to assemble all the information the incident commander might need during a fire. (p. 80)

This paper will seek to identify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning.

This applied research project (ARP) is relevant to the *Leading Community Risk Reduction* course in the area of Unit 2, assessing community risk. The student manual refers to the enabling objective "Conduct a community risk assessment that identifies and assesses the critical hazards and vulnerabilities of a typical community." (National Fire Academy [NFA] 2003, p. SM 2-1) Massey (2004) stated:

> A plan that can answer any question you might have about a building and its systems – how to get around, how to cut things off, how to interface with the systems – is every bit as valuable as anything you might bring into the building with you. Pre-plans can make or break the entire operation, whether it be in a chemical plant, hospital, shopping mall or high-rise building. (p. 96)

This research project supports the efforts of the United States Fire Administration (USFA) operational objective that says "reduce the loss of life from fire of firefighters" (NFA, 2003, p. II-2). Gerald Naylis (1998) states "We learn that many of the deaths and injuries are attributed to the

fact that the firefighter(s) did not know something, usually about the building or its contents" (p. 26).

Literature Review

The purpose of this literature review is to set a descriptive foundation in gathering and reviewing relevant information to clarify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning. Four basic questions need to be addressed.

The first question, what is the definition of pre-fire planning and what are the advantages related with pre-fire planning? Angle, Gala, Harlow, Lombardo, Maciuba (2001) wrote "The value of preincident planning can not be emphasized enough, both from an operational standpoint and a safety standpoint. Having preincident plans available is like a coach having the play book at a game" (p. 121). In an article obtained from the Internet Sendelbach (2004) stated:

> Fire service building construction veteran Francis Brannigan once said, "there is no substitute for the fire department developing a system of accumulating and organizing information for retrieval at the time of the fire. This situation is analogous to military intelligence. It is vital to know the disposition of the enemy." Knowing your enemy is a rule every firefighter and fireground commander should live by. No fireground can ever be made entirely safe, but it goes without saying, if we know the enemy up front the odds of winning the war are dramatically increased in our favor. (Lesson #1 Preparation/Planning Section, ¶ 3)

Bachman (2000) stated, "Preincident intelligence – commonly known as preincident planning, preincident survey, or risk assessment – is a vital fire department resource. Its objective is

to identify hazards and response limitations in your community" (p. 87). Pre-fire planning goes by many names that include: pre-incident planning, pre-incident intelligence, and pre-plans, preemergency, and pre-fire analysis. The prefix pre is defined "(1) an earlier or prior time, (2) preliminary or preparatory work or activity, (3) a location in front of or anterior to" (Davies, 1980, p. 554).

The National Fire Protection Association (NFPA) 1620 (2003 edition) defines pre-incident plan as "A document developed by gathering general and detailed data used by responding personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specified facility" (p. 1620-6). In his book Smoke (1999) asserted that "Preemergency planning is a process of preparing a plan for emergency operations at a given occupancy or hazard" (p. 289). According to Carter and Rausch (1989):

> A prefire plan is a survey of a potential fire hazard and a plan for fighting a fire that might strike a particular occupancy. The plan includes the key matters that influence a fire attack. The purpose of prefire plans is to enable attack preparations and fire fighting operations to be carried out at the scene of a fire as efficiently and effectively as possible. (p. 202)

Brad Beck (1993) expressed that, when conducting the surveys for pre-fire plans it was to look for and become comfortable with the arrangement of the building, what is inside, construction and integrated protection features, and to not conduct a fire inspection. The IAFC and the NFPA (2004) defines "Preincident planning is the process of obtaining information about a building or a property and storing the information in a system so that it can be retrieved quickly for future reference" (p. 648). "Pre-incident surveys provide knowledge of building construction, hazardous materials storage, building layout, special processes, fire notification and suppression features, and occupancy concerns" (International Fire Service Training Association [IFSTA], 1998, p. 662). In

his article James Mason (2004) spoke about pre-planning and what it should entail. Pre-planning should include three fireground size-up concerns. The first being how the building is built and how it will behave during the extreme heat and smoke from fire. The second is the occupancy, which will point out the number of potential victims that may be inside and their possible locations. The third is the building layout and how it will effect the hose reach and search and rescue operations. (p. 63)

"The firefighter's responsibility… begins at the firehouse with training and pre-planning. Familiarization with each buildings system in your district is a must and every firefighter should have a working knowledge of that system" (Klett, 2004, ¶ 2). Ben Klaene and Russ Sanders (2000) states, "A plan describes important building features, life safety considerations, extinguishment factors, and general information about the building" (p. 20). Terpak (2002) talks about the need for officers to have precise and pertinent information prior to a call being received. The prefire plan begins the officer's gathering of information to assist in his decision making process (p. 69). Bachman (2000) states, "Knowing the hazards and types of construction in your protection area determines the type of equipment you will maintain and the areas of training you will emphasize" (p. 87). According to Pisciotta (2000) "Information is collected, evaluated, and documented and is stored in a retrieval format so it can be used for future reference. Ideally, the information is periodically reviewed and updated" (p. 79). Goldfeder (2004, ¶ 8) explains that the tactics used on firegrounds take into consideration many factors and one is the pre-planning process that was completed prior to an incident. In their article Munger and Neale (2003) state:

> Look at the preincident plans in your station. Not only do they include the access roads, building footprint, and fire hydrants, but they probably include fire wall and door locations,

> fire department sprinkler and standpipe connections, smoke management systems controls, and known locations of hazardous materials and processes. (p. 68)

Klaene and Sanders (2000) wrote, “A formal pre-incident plan drawing, using intuitive symbols, should also be included to help firefighters find important building features” (p. 20). In an article retrieved from the Internet it states, “Pre-incident plans should include drawings showing the location of fire sprinkler valves and intakes, fire pumps, any other part of the system firefighters can control” (Klaene and Sanders, 2004, ¶ 7).

Bachman (2004) found “Although preincident intelligence will enhance your knowledge about the hazards of a facility, it is just as important to gather information on situations and systems that will benefit your operations or make your job easier” (p. 111). “When preplanning, consider tactics, strategies, and action paths. Preplanning clears the screen for the rescue commander and allows him to focus on unique aspects and variables of the particular incident” (Avillo, 2002, p. 57).

Gary Keith (1995) stated, ”When pre-incident planning is successful, everyone wins. The fire department manages its response effectively which results in minimal property loss. Minimal property loss keeps the facility in business, which maintains the tax base for the fire department’s budget” (p. 38).) “Within a jurisdiction are many sites and building complexes that could reflect an economic, political or physical impact to the community. The fire department should aggressively identify these, compile necessary information and develop a pre-fire plan” (Hart 2001, ¶ 3). In his article *No Empty Threat* Jon Jones (2001) discusses that fire departments should make every attempt to evaluate buildings in their city and form pre-fire plans. Information that is gained about the building and the hazards it contains is paramount to the decision making process (Preventing fires section, ¶ 8).

According to Bachman (2004) “The benefits of gathering preincident intelligence at target hazards cannot be overstressed. Our communities are constantly changing, and we must maintain up-to-date and accurate information on the facilities we protect” (p. 111). “The ideal maintenance procedure should provide for a review of each plan on at least an annual basis” (NFPA, 2003, 1620-14). In another article Bachman (2004) he wrote, “Gathering preincident intelligence of target hazards is critical. The more we know about potential hazards, the safer our personnel will be and the more effective and efficient our operations will be” (p. 135). “Preemergency planning enhances effective and safer operations, helps you save lives and protect property” (Smoke, 1999, p. 289). In his article Fetrow (1998, ¶ 3) stated:

> How important is preplanning? Stop and think. How easy is it for you to remember every exacting detail of each room within your home? It’s not that easy at all. Yet, you spend 12 to 14 hours a day there. Apply this example to a large commercial structure that you drive by occasionally. Even if your department toured it on a regular basis, it would still be tough to remember all the details that could affect the outcome of an incident.
>
> James Mason (2004) stated in his article *Preplanning Residential Dwelling Fires* that:
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> By preplanning, experienced members review and pass on their knowledge to the newer ones. It is a way to bring the entire company home at the end of the shift by ensuring communication and improving efficiency during changing fireground conditions. (p. 74)

Fire and rescue departments must consider the various Federal and state laws and regulations that apply to fire and rescue operations. The most significant regulations are those released by Federal and state occupational safety and health agencies (OSHA). The OSHA regulations are not the only legal requirements that the fire department should consider. There are a number of non-governmental organizations that have issued voluntary standards. Such organizations include

National Fire Protection Association (NFPA), American National Standards Institute (ANSI), and National Institute for Safety and Health (NIOSH). NIOSH (2004) presented a report on a firefighters death and one recommendation is to conduct pre-fire planning that includes the building type, construction, and components to assist in the development of safe fireground strategies (p. 1).

The second research question asks how are other fire departments performing pre-fire planning? In his article Lathrop (2003) stated, "Many fire departments have poor or no preplanning programs. … However, that does not change the fact that many fire departments lack effective preplans. Others have a very difficult time keeping preplans or in-service inspections current" (p. 80). Many departments may perform a pre-fire plan on only their large target hazards. Some departments will only conduct pre-fire plans on buildings and not prepare for other types of emergencies like hazardous materials release, mass casualty incidents, terrorist attack, or a natural disaster. Yet, other departments will complete the pre-plans but never train or test the pre-plans to ensure that it is workable.

In an article retrieved from the Internet Knapp (1998) discusses how pre-fire plans were performed for the City of Rock Hill, Missouri. All the businesses in Rock Hill are preplanned with a basic preplan that includes potential life hazards, the building layout, construction features, hazardous materials locations and amounts, and water supplies (Prefire Planning section, ¶ 1).

Central Kitsap Fire and Rescue has a good pre-fire planning program. The firefighters are assigned buildings, gather all pertinent data and develop the plans. The pre-plans contain all contact information for the building, water supply information, construction type, fire protection information, and special hazards. The firefighters also complete drawings to scale with a computer aided design program (Tague, 2004, ¶ 2). Val Codino (2004) stated:

> Central Kitsap Fire & Rescue is fitting its apparatus with ruggedized computers and pre-fire planning software so crews can respond to fires with better information that is easy to access. The department has been able to develop pre-fire plans, using Fire Zone and First Look Pro, for 1500 buildings. (p. 160)

Jack Bennett (1999) stated, "A variety of systems were employed to pre-plan fire emergencies. The Los Angeles City Fire Department and others used a method called the Building Inventory System" (p. 6). Bennett (1999) continued to describe the building inventory system. The department was separated into five different districts. Target hazards were identified then written information was put onto one side of paper, and a drawing of the building was put on the other. The paper was then laminated and placed into a binder and carried on the first due apparatus and battalion chief's vehicle (p. 6).

In a survey retrieved from the Internet conducted by Fire Engineering (2004) showed "All departments choose high-hazard locations for preplanning, but does your department preplan its responses to less assuming target hazards such as remote pumping stations or utility stations? 44.68% responded yes, while 55.32% responded no" (¶ 1). In another survey retrieved from the Internet conducted by Firehouse.com (2002, ¶ 1) illustrated:

> How often does your department update and or check the corrections of pre-fire plans? Out of 7414 total votes, 6.5% responded monthly, 44.1% responded annually, 6.6% responded every 2 years, 16.1% responded greater than 2 years, and 26.5% responded never or other or N/A.

In his commentary Carter (2000, ¶ 15) stated, "These are the same people who realize the critical importance of partnering with their neighbors in the following ways: … Pre-incident planning with your automatic aid partners". In a review released from the United States Fire

Administration on two 1998 high-rise fires cited “Large-scale incidents in high-rise buildings require a significant commitment of personnel and equipment. Pre-incident planning is one of the best ways to identify those resources that will be required before they are needed” (West, 2003, ¶ 7). Staskey (2004) found the following:

> The success of high-rise firefighting operations and the fire units’ initial strategy and actions depend on the following: a well-developed and practiced plan; coordination among the building’s staff, first-arriving units, and the incident commander; and accurate initial information. …The Flagstaff Fire Department took the following actions …High-rise preplan books were given to the mutual-aid companies. (P. 107)

As indicated by Bennett (1999) “The Phoenix Fire Department was perhaps the leader in the computerization of pre-fire planning” (p. 8). As stated in the Standard Operating Procedures of the Phoenix Fire Department (2002, ¶ 1 - 6) pre-incident planning gives firefighters relevant detail regarding a building that will assist in their response to an emergency at that location. The information consists of fire protection concerns, building layout, construction details, fire protection systems, and any other data that could influence strategies and tactics during the emergency. Quarterly, company officers will select occupancies to pre-plan in their area. The company officer should work in conjunction with the building representative. When conducting the pre-plan, it should be utilized as a training opportunity, and all information should be passed on to the other shifts. Each shift conducts pre-plans on different buildings. When completed the information is entered on the station computer. Anderson (2002, ¶ 3) stated:

> In the many instances in which a radio just doesn’t allow us time and space to communicate effectively, we need to develop other media for communicating our thousand yard thoughts,

messages, ideas, and information. In the Phoenix Fire Department, we use computer-aided dispatch (CAD), mobile data terminals (MDT's) and mobile computer systems to do this.

In an article found on the Internet, Houston Fire Department (2000) website states, "Emergency Operations Command personnel are not involved in the inspection duties or code enforcement. However they are responsible for pre-fire planning (Tactical Assessment and Evaluation Plans), pre-incident apartment diagramming, and High-rise surveys" (¶ 4). In his article Kalman (1993) discusses the pre-fire planning process for the City of Austin, Texas. The City was divided into five districts and each company was assigned target sites to preplan. The plans were put on standard forms and carried on each battalion chief's vehicle for their first due area. When the plans became too numerous to carry they looked into other ways and found a program that they could scan the preplans into their computer and then have dispatch fax them out when an alarm came in for the particular building (p. 45).

There are many ways of pre-planning, and many innovative ideas in pre-planning. Burnham (1998) stated, "Assuming you're the Milwaukie (Ore.) Fire Department, you hire students from the nearby Sabin Skills Center to create the plans with easy-to-use drawing software" (p. 80). "Preincident surveying an limited access highway enables a fire department to establish certain response guidelines including standardized preincident survey maps and symbols for standardized communications, which enhance efficiency and effectiveness" (Bachman, 1998, Preparing a Survey section, ¶ 2). In their article Finucane and Price (2002) stated, "To help ensure better response times, the Johnson City (TN) Fire Department has mounted large color-coded maps of the VA Center and the local university, … on the fire station walls. …in a prefire planning notebook on the apparatus" (p. 113).

In an article retrieved from the Internet from the City of Franklin, TN Fire Department (2004) it stated: “Pre-fire planning inspections are part of the job functions performed by the shift personnel. …Firefighters strive to complete pre-fire planning inspections of all commercial, industrial, institutional, and other similar type buildings twice a year” (Fire Prevention section, ¶ 1). Another article retrieved on the Internet from the Cork City Fire Brigade, Ireland (2002) indicated, “Personnel in each fire station should have readily available to them relevant information as to the buildings in their area which prevent special risks …Pre-incident planning is carried out by fire crews visiting different premises on a systematic basis” (Pre Incident Planning section, ¶ 1). Codino (2004) found:

> The BIC fire was the ultimate wake-up call for the Milford Fire Department – one that LaVecchia answered by making pre-fire planning not just a top priority for his personnel, but part of the department’s culture. “We have seven companies doing pre-fire planning daily,” LaVecchia explained. “Each company is responsible for about 100 pre-fire plans a year.” The result of this aggressive approach is that Milford has achieved a Class 1 rating by the Insurance Service Offices Inc. (ISO). (p. 157)

The third question addresses what new technology is available for pre-fire planning? Lohner (2003) stated:

> Pre-fire and pre-incident planning were important tasks prior to Sept. 11, 2001. However, in the wake of increased terrorist threats and the ongoing war on terrorism, pre-fire planning has become critically vital. …Fortunately, computer technology is playing a pivotal role in the preparation of pre-incident diagrams. (p. 10)

In his article Wolf (2003) stated, “The fire service is on the cusp of an electronic frontier in the use of concepts such as eCommerce and eBusiness to create a new way of providing traditional

fire services" (p. 73). With the computer age, today modern technology has brought about numerous changes and capabilities to computer systems. Some of these changes are software that has been developed to assist in the storage and retrieval of pre-incident plans. Wolf (2003) also wrote, "There is a saying that the fire service is '200 years of tradition unimpeded by progress'" (p. 74). Although not many departments have embraced this technology as noted in another survey retrieved from the Internet conducted by Firehouse.com (2000) showed:

> Does your department utilize onboard computer systems to assist in response and pre-planning? Out of 4987 total votes, 3.7% yes response only, 7.8% responded yes variety of other functions, 32.5% responded no but being planned, 50.9% responded no, no intention, and 5.1% responded N/A.

"Computerization has also affected the operations of fire fighting. Fire apparatus and chief officer vehicles are equipped with computers that provide immediate access to CAD, hazardous materials references, pre-fire plans and accountability systems" (Werner, 2001, Computers section, ¶ 3). According to Cook (2001) "Computers – fast becoming the preferred pre-plan-storage method – make it significantly easier to organize pre-plans" (p. 61). Moore (1993) stated, "Computer fire models can be used to develop more realistic prefire plans" (p. 25). "You cannot just haphazardly place blueprints and other floor plan information in a book or scan it into a computer program" (Bachman, 2003, Information Management section, ¶ 1). In his article Anderson (2002) discusses about the computer program that was written for the Phoenix Fire Department. The program was particularly written for portable use for firefighters, easily transferable to other programs, consistent user interface, and the pre-fire plan information would be stored on the computers hard drive (What We Got section, ¶ 1).

GIS technology is one type of another tool that is available to assist departments in pre-fire planning. "The department looked to GIS data for quick, visible, up-to-date information on pre-incident surveys, hazmat facilities, dangerous buildings problem hot spots, repeat calls, arsons, false alarms, water supplies, prevention activities and inspection schedules" (Oliver, 2002, Uncharted technology section, ¶ 1). "Using onboard hard drives that are updated every month, the gis software lets the firefighter use icons and a touch-screen interface to retrieve diagrams, floor plans and document imaging details on pre-fire survey information" (Elliott, 2000, ¶ 13). GIS is just right for pre-fire planning, by assisting in analyzing and displaying building locations, hazardous material locations, hydrant locations, and other vital information. In his article Elliott (2000, ¶ 16) discusses MapObjects and NetEngine the two main components of the GIS system for Winston Salem, NC, which are two software programs from Environmental Systems research Institute (ESRI, n.d.). ArcView and other mapping software from ESRI are industry standards with nearly 50% of government market in 1997 according to a research firm.

The United States Fire Administration (USFA) in cooperation with Commission on Fire Accreditation International (CFAI) developed the risk, hazard and value evaluation (RHAVE) to assist in achieving standardized risk identification. This software doesn't aid the department in the development of pre-incident plans, but it is a tool that assists in demonstrating the specific risks and hazards in any given community.

Another tool or technology advancement available for pre-fire planning is called Pictometry. Parow (2003) stated, "Pictometry, … has developed a visual intelligence system that uses aerial photography imaging to capture, process, and analyze orthogonal (straight down) and oblique (taken from angles) images to create an aerial '3-D map' of a given area or location" (p. 95). The Pictometry imagery displays features such as buildings, neighborhoods, and roads to be

viewed from several directions and at different scales. It will allow a firefighter to easily locate and correctly measure any feature, and the system is GPS based. Parow (2003) also wrote, "A view of an area or structure can now be made from a computer screen, allowing agencies to plan and respond more accurately" (p. 95).

A new advancement that Wolf (2003) talks about:

> One eFire application is to install a tamper-resistant bar code at the fire department's primary access point on every commercial building in the community. Firefighters could scan the barcode on arrival. … The computer would read the barcode and pull up the record for that building. All of the information for that building (prefire plans, inspection reports, floor plans, permits, haz-mat information, previous calls, emergency contact information) would be available to the firefighters on handheld PDAs or on mobile data terminals in the cab of the fire engine. (p. 73)

Another idea that could be utilized is HTML based pre-fire plans. Cook (2001) found:

> Everyone knows how to use the Internet, so why not create preplans in the same format as Web Pages using HTML formatting? …I developed a system based on the following criteria:
>
> - Preplans should allow users quick access to the Info;
> - Preplans should be simple to use, requiring only a touchscreen, mouse or other pointing device;
> - Preplans should allow easy updates and maintenance; and
> - Preplans should be thorough.
>
> With these basic ideas to build on, I decided local files of HTML-based preplans stored on laptops or mobile data computers (MDC) would prove the fastest and cheapest. (p. 61)

Several computer-based programs have been developed and are available to assist in completing and storing pre-fire plans. One of the developers is Cad Zone Incorporated. Cad Zone has two programs to assist in the pre-fire planning process. The first is The Fire Zone, which is CAD driven and allows departments to produce comprehensive drawings of facilities in their response area. The second is First Look Pro, which is designed to organize all the information or data on a building along with the drawings that were created in The Fire Zone (The CAD Zone, n.d.). Codino (2004) wrote:

> First Look Pro complements The Fire Zone by letting fire personnel organize and locate pre-fire plan diagrams and information within seconds. By simply selecting an address, occupancy name or pre-plan identification number, the incident commander has immediate access too all the pre-fire plan information that is critical to the firefighting effort. (p. 158)

A different program available with many different applications including pre-fire planning is Firehouse Software® suite. The software has many components. The pre-plan module is a database that allows firefighters to store extensive preplan information, which includes building information, onsite hazardous materials, water supply locations, inspection history, emergency contact information, and needed fire flows. The program does not have a drawing component, but it is able to import attachments to view pictures and drawings (Firehouse Software®, n.d.).

Another software company on hand is FDM software. They currently offer a comprehensive CAD and records management software solutions that contain 11 different modules for Public Safety. One module is a database module for properties, which is the foundation for all permit, incident and inspection data. Property data includes: building type, construction history, occupancies, fire protection features, hazmat inventories, and contact information (FDM software, n.d.).

Microsoft has a diagramming program available called Visio. Visio 2003 is a diagramming program that can help you create business and technical diagrams that document and organize complex ideas, processes, and systems. Diagrams created in Visio 2003 enable you to visualize and communicate information clearly, concisely, and effectively in ways that text and numbers cannot. Visio 2003 also automates data visualization by synchronizing directly with data sources to provide up-to-date diagrams, and it can be customized to meet the needs of your organization (Microsoft, n.d.).

According to Massey (2004) "You're now dealing with emergencies in the 21st century, in the most dangerous times for the fire service. Every 'tool' you have at your disposal must be utilized" (p. 102).

The fourth question asks what elements do members of the BRFRS desire in such a program so they will readily utilize it? Cook (2001) stated, "Ease is the key to get the troops to use the system and low cost is the key to get administration to loosen the purse strings" (p. 65). Lathrop (2003) found that "One of the best ways to help is to keep it simple, keep it logical, consider all variables, and remember the person who has to use the system during an emergency" (p. 89). "Heeding the words of Phoenix Fire Chief Alan Brunacini: 'Filing, storing, and finding preplans presents many functional and practical problems. Simply, if you can't find it, you can't use it'" (Anderson, 2002, What's Next section, ¶ 1).

In *NFPA 1620 Recommended Practice for Pre-Incident Planning* (2003) it discusses the need for a system that permits it to be retrieved without difficulty while responding to emergencies in the apparatus (NFPA, 2003, p. 1620 – 9.1). Klaene and Sanders (2000) stated, "Pre-incident planning provides a way to protect firefighters and better serve the community. These plans should include information important to the incident commander, and they should be

current, correct, and accessible at the emergency scene" (p. 98).

According to Clark (1991) "Pre-fire planning will identify major problems, prescribe what is needed to meet them, and provide for meeting such needs. A pre-fire plan should not go too deeply into step-by-step actions" (p. 285). Kansky (1995) stated, "The main goal of pre-planning is to have a game plan ready before it's needed. Having correct and updated pre-plans in place means that fireground operations can be conducted safely and efficiently" (p. 47).

The NFPA (2003) also stated:

> The following factors should be evaluated when assessing the potential situations that could affect a facility during emergency conditions:
>
> - Construction
> - Occupant characteristics
> - Protection systems
> - Capabilities of public or industrial responding personnel
> - Availability of mutual aid
> - Water supply
> - Exposure factors (p. 1620-7)

Bachman (2001) found, "Preincident surveying is a never ending task. You must constantly monitor facilities for physical and administrative changes" (p. 72). In another article from Bachman (2003) he wrote:

> You must gather, study, and maintain preincident intelligence. Get out in your community; see what you protect and how you will respond to an incident. Do not become complacent just because you have gathered preincident intelligence on a facility. Continually process

> the information, practice during exercises, and regularly revisit facilities to ensure you have the most accurate information. (Applying The Lessons section, ¶ 4)

Lathrop (2003) discusses that some of the particulars of the buildings could be forgotten, even if you have returned to resurvey the property. In addition, it is very lengthy and near impossible to make all shifts know the buildings inside and out (p. 80). Naylis (1998) found:

> Having more than a basic or cursory knowledge of a building and its contents is a matter of survival for the firefighter. Without this information, the firefight is reduced to a guessing game in which there are many questions and few answers. Conversely, when armed with detailed construction, occupancy, protection, and exposure information about the fire building, the firefighter will be well positioned to COPE on the fireground. (p. 28)

In summary, the reviewed literature has influenced this applied research project by establishing a need for an improved pre-fire planning program to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton. In addition, recognizing the national standard, NFPA 1620 will assist the department in developing and performing pre-fire plans. The fire service in general has a considerable amount of information that it can learn from businesses, industries and the armed forces to assist in the development of a pre-fire planning program. In the words of former Secretary of State Colin Powell “The business of a leader is to turn weakness into strengths, obstacles into stepping stones, and disaster into triumph” (Angulo, 2000, p. 58). Pre-fire plans can assist in reducing firefighter deaths and property loss when utilized during emergency incidents. Fire departments that have utilized an up to date pre-fire planning program have seen benefits since they have instituted them. There are several computer software programs available to assist the department in establishing an improved pre-fire planning program. All the

information acquired from this literature review will assist in the development of an improved pre-fire planning program.

Procedures

The purpose of this applied research project is to clarify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning. This paper will use descriptive research methodology to help direct this research project towards the answers of the research questions. When researching the questions four primary resources were utilized.

First, the process began at the National Fire Academy's Learning Resource Center (LRC) in Emmitsburg, Maryland in August 2004 with an extensive research and data collection process for the literature review. Research and data collection began with a search of the online card catalog at the LRC, by entering pre-fire, pre-incident, pre-emergency planning, pre-plan, preplanning and pre-incident survey. The results of this research and data collection included Applied Research Papers, fire service books, fire service trade journals and magazines, national standards, brochures and various training publications on the subject of pre-fire planning, pre-incident planning, and pre-incident surveys. To further review the research and data that was collected, photocopies were made.

Next, BRFRS's training library was also utilized for the literature review. Sources that were used included fire service textbooks; fire service trade magazines, fire service handbooks, and fire service codebooks, Boca Raton's building survey book, and pre-plan book.

Third, an extensive search was conducted online by using several different search engines by entering pre-fire, pre-incident, pre-emergency planning, pre-plan, preplanning and pre-

incident survey. Information was then reviewed for any pertinent material; if applicable it was downloaded and printed. In addition, some of the author's personal collection of books and trade magazines were utilized for the review. The information obtained for the literature review needed to address at a minimum one of the research questions, and it needed to be as current as possible. Altogether, over 75 different sources were utilized for the literature review.

Two surveys were developed for this research project. One, to provide insight on what other departments were doing for pre-planning, and the other to find out what members of BRFRS would like in a pre-planning program. Convenience sampling was used for both surveys.

The first survey was an external survey that was sent to Fire Chiefs of departments within the State of Florida that were listed in *The Who's Who* book from the Florida Fire Chiefs Association. This survey along with a cover letter located in Appendix C was mailed through the United States Postal Service (USPS). The total population for this survey was 248 fire departments. 147 of the surveys were completed and returned within the time frame given. The survey was designed to answer if the departments questioned were conducting pre-fire planning, on what types of structures they pre-planned, how they were storing the pre-plans, how often they performed and who performed the pre-plans, and were they using the pre-fire plans. The final two questions inquired what type of jurisdiction and department they represented. The results were totaled and a percentage of yes and no answers were compiled for questions 1, 3, 7, and 10. The finished survey and the results are located in Appendix D.

The second survey was developed as an internal survey for the uniformed personnel, which includes the uniformed administrative staff, not civilian staff at BRFRS. Out of 185 uniformed personnel 160 completed the survey. The survey is located in Appendix E. The survey first asked recipients whether they thought a pre-plan program would benefit the department; it also asked if

tactical procedures should be included in the pre-plan. These two questions were yes or no answer questions and the results were calculated and a percentage was recorded. The following 14 dimensions were for the respondents to rate how significant they feel each dimension is to pre-planning. The next two questions asked how and where the plans should be accessed and carried. The last question requested information on what would be desired in a pre-plan program. This survey was developed to identify what elements are desired in a pre-planning program by BRFRS personnel. This information will assist in the development of an improved pre-fire planning program. The results from the survey are located in Appendix F.

Assumptions and Limitations

Assumptions may include that the population completing the surveys understood every question from the survey. It was also assumed that all respondents answered all questions honest and without any partiality.

Several limitations were experienced through the progress of this applied research paper. Of the 248 departments surveyed only 147 departments (59 percent) responded. No attempt was made to contact any of the non-respondents. An additional limitation was the short amount of time for the respondents to return the survey.

The second survey, or internal survey was limited because 25 employees did not respond due to absence from work the week the survey was compiled. Another limitation was not identifying the positions of those people that completed the survey.

In addition to those limitations, is the limited amount of practice completing and compiling surveys by this writer.

Definition of Terms

Advanced Life Support (ALS). EMS personnel trained to use intravenous therapy, drug therapy, intubations and defibrillation.

CAD. Computer Aided Dispatch is a combination of hardware and software systems that simply track initial information and response times to sophisticated technology.

Career Fire Department. A department that utilizes full-time paid employees

Combination Fire Department. A department that is made up of career (full-time/paid) and volunteer (part-time/ not paid, or on call) personnel.

Community Emergency Response Training (CERT). A group that is organized and receives special training that enhances their ability to recognize, respond to and recover from a major emergency or disaster situation.

Company officer. A first-line supervisor in charge of a specific response unit and its personnel.

EBusiness. The conduct of business on the Internet.

ECommerce. Is defined as the conduct of financial transactions by electronic means.

Emergency Medical technician (EMT). A person that is certified and has successfully completed the U.S. Department of Transportation curriculum for EMT-Basic.

EMS. Emergency Medical Services. A complex health care system that provides immediate on scene patient care to those that are injured or suffering from an illness.

First Due. The response area of a particular unit when they are in quarters.

HTML (Hypertext Markup Language) - The coded format language used for creating hypertext documents on the World Wide Web and controlling how Web pages appear.

GIS. The acronym for Geographic Information System, which is a type of computerized data management. This system is designed to capture, store, analyze, retrieve, and report both geographic and demographic information.

GPS. The acronym for Global Positioning System is a system for determining position on the earth's surface by comparing radio signals from several satellites.

International Fire Service Training Association (IFSTA). A nonprofit educational association of fire fighting personnel who are dedicated to upgrading fire fighting techniques and safety through training (IFSTA).

NFPA 1620. *Recommended Practice for Pre-Incident Planning*, 2003 edition.

Pictometry. A unique patented information system that combines aerial imaging with a state of the art software system that has the ability to provide Visual Intelligence™.

Pre-planning. A survey and analysis of a commercial, or large residential occupancy that assists in the familiarization with the facility in planning for future potential incidents.

Size-up. A systematic process of information gathering and situation evaluation that begins when an alarm is received (Jones and Bartlett).

Target Hazard. A facility in which there is a potential likelihood of life or property loss from a fire (IFSTA).

Results

The researcher was searching for well-defined and detailed answers to the questions. The results of the literature review presented these answers for research question 1:

The research presented some different terminology that was synonymous with pre-fire planning, like pre-incident planning, pre-emergency planning, pre-plan, preplanning and pre-incident survey. The research offered several definitions that were one and the same with pre-

fire planning. An example would be Bachman's (2000) article that stated, "Preincident intelligence – commonly known as preincident planning, preincident survey, or risk assessment – is a vital fire department resource. Its objective is to identify hazards and response limitations in your community" (p. 87).

Pre-fire planning is a plan that is developed by firefighters that gives them relevant detail regarding a hazard or occupancy that will assist in their response to an emergency at that location. The information consists of building layout, construction details, fire protection systems, location and type of hazardous materials storage, and type of occupancy along with any other data or general information about the building that could influence strategies and tactics during the emergency. NFPA (2003) defines pre-incident plan as "A document developed by gathering general and detailed data used by responding personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specified facility" (p. 1620-6).

There are many advantages that were found during the literature review, the main overriding advantage is that of safety. The occupants of the building and the firefighters responding to the emergency would both benefit. "Preemergency planning enhances effective and safer operations, helps you save lives and protect property" (Smoke, 1999, p. 289). In another article Bachman (2004) stated, "Gathering preincident intelligence of target hazards is critical. The more we know about potential hazards, the safer our personnel will be and the more effective and efficient our operations will be" (p. 135).

The results of the literature review presented these answers for research question 2:

The literature review provided many articles on how other fire departments are performing pre-fire planning. Many departments rely on hard copies stored in three ring binders on their apparatus, while others are utilizing computer software programs with laptop computers or mobile

data terminals (MDT) mounted in their vehicles. Lathrop (2003) stated, "Many fire departments have poor or no preplanning programs. … However, that does not change the fact that many fire departments lack effective preplans. Others have a very difficult time keeping preplans or in-service inspections current" (p. 80).

In an article retrieved from the Internet from the City of Franklin, TN Fire Department (2004) it stated: "Pre-fire planning inspections are part of the job functions performed by the shift personnel. …Firefighters strive to complete pre-fire planning inspections of all commercial, industrial, institutional, and other similar type buildings twice a year" (Fire Prevention section, ¶ 1).

Val Codino (2004) wrote, "Central Kitsap Fire & Rescue is fitting its apparatus with ruggedized computers and pre-fire planning software so crews can respond to fires with better information that is easy to access" (p. 160). Central Kitsap Fire and Rescue firefighters are assigned buildings, gather all pertinent data and develop the plans. The firefighters also complete drawings to scale with a computer aided design program (Tague, 2004, ¶ 2).

Jack Bennett (1999) mentioned, "A variety of systems were employed to pre-plan fire emergencies. The Los Angeles City Fire Department and others used a method called the Building Inventory System" (p. 6). Burnham (1998) stated, "Assuming you're the Milwaukie (Ore.) Fire Department, you hire students from the nearby Sabin Skills Center to create the plans with easy-to-use drawing software" (p. 80).

"The Phoenix Fire Department was perhaps the leader in the computerization of pre-fire planning" (Bennett, 1999, p. 8). As documented in the Standard Operating Procedures of the Phoenix Fire Department (2002, ¶ 1) Quarterly, company officers will select occupancies to pre-plan in their area. The company officer will work in conjunction with the building representative, and utilize the pre-plan as a training opportunity. All information should be passed on to every

shift, and each shift conducts pre-plans on different buildings. When completed the information is entered on the station computer.

The results of the literature review presented these answers for research question 3:

To answer this question the researcher was looking for literature that primarily addressed new technology that was available, to obtain the objective of an improved system. Wolf (2003) stated, "There is a saying that the fire service is '200 years of tradition unimpeded by progress'" (p. 74). According to Cook (2001) "Computers – fast becoming the preferred pre-plan-storage method – make it significantly easier to organize pre-plans" (p. 61). Lohner (2003) stated:

> Pre-fire and pre-incident planning were important tasks prior to Sept. 11, 2001. However, in the wake of increased terrorist threats and the ongoing war on terrorism, pre-fire planning has become critically vital. …Fortunately, computer technology is playing a pivotal role in the preparation of pre-incident diagrams. (p. 10)

In his article Wolf (2003) continued, "The fire service is on the cusp of an electronic frontier in the use of concepts such as eCommerce and eBusiness to create a new way of providing traditional fire services" (p. 73). In a survey retrieved from the Internet conducted by Firehouse.com (2000) it showed that 83% of the respondents were not utilizing onboard computer systems, but 32.5% were planning for computer use.

"The department looked to GIS data for quick, visible, up-to-date information on pre-incident surveys, hazmat facilities, dangerous buildings problem hot spots, repeat calls, arsons, false alarms, water supplies, prevention activities and inspection schedules" (Oliver, 2002, Uncharted technology section, ¶ 1). "Using onboard hard drives that are updated every month, the GIS software lets the firefighter use icons and a touch-screen interface to retrieve diagrams, floor plans and document imaging details on pre-fire survey information" (Elliott, 2000, ¶ 13).

Parow (2003) stated, “Pictometry, … has developed a visual intelligence system that uses aerial photography imaging to capture, process, and analyze orthogonal (straight down) and oblique (taken from angles) images to create an aerial ‘3-D map’ of a given area or location” (p. 95).

Several computer-based programs have been developed and are available to assist in completing and storing pre-fire plans. Cad Zone has two programs to assist in the pre-fire planning process, The Fire Zone, which is a drawing program, and First Look Pro, which is a database for building information. Codino (2004) wrote, “First Look Pro complements The Fire Zone by letting fire personnel organize and locate pre-fire plan diagrams and information within seconds” (p. 158). A different program available with many different applications including pre-fire planning is Firehouse Software® suite. The pre-plan module is a database that stores preplan information, however the program does not have a drawing component, but it is able to import drawings. Another software company on hand is FDM software. They have a module that is a database module for properties.

The results of the literature review presented these answers for research question 4:

To answer this question the researcher was looking for specific information on what others desired, which could potentially be the same desires of BRFRS personnel. Cook (2001) wrote, “Ease is the key to get the troops to use the system and low cost is the key to get administration to loosen the purse strings” (p. 65). “Heeding the words of Phoenix Fire Chief Alan Brunacini: ‘Filing, storing, and finding preplans presents many functional and practical problems. Simply, if you can’t find it, you can’t use it’” (Anderson, 2002, What’s Next section, ¶ 1). Lathrop (2003) found that “One of the best ways to help is to keep it simple, keep it logical, consider all variables, and remember the person who has to use the system during an emergency” (p. 89).

Klaene and Sanders (2000) stated, “Pre-incident planning provides a way to protect

firefighters and better serve the community. These plans should include information important to the incident commander, and they should be current, correct, and accessible at the emergency scene" (p. 98). In *NFPA 1620 Recommended Practice for Pre-Incident Planning* (2003) it discusses the need for a system that permits it to be retrieved without difficulty while responding to emergencies in the apparatus (NFPA, 2003, p. 1620 – 9.1).

As Clark (1991) stated in his book *Firefighting Principles and Practices p*re-planning will discover potential key problems, recommend ideas to assist in mitigating the situation, and inform how to implement those ideas. The pre-plan should not list step-by-step strategies or tactics (p. 285). Kansky (1995) stated, "The main goal of pre-planning is to have a game plan ready before it's needed. Having correct and updated pre-plans in place means that fireground operations can be conducted safely and efficiently" (p. 47).

Several articles were found that indicate pre-plans constantly need to be updated and reviewed. The buildings or hazards will change over time and the pre-plans need to accommodate these changes. Bachman (2001) found, "Preincident surveying is a never ending task. You must constantly monitor facilities for physical and administrative changes" (p. 72).

In addition to answering the research questions, two surveys were completed. The surveys were intended to evaluate and differentiate the findings from the literature review. The external survey was developed to ascertain if the departments questioned are performing pre-planning, identifying what types of buildings they were performed on, see how often the pre-plans were reviewed and updated, and who creates the pre-plans. It was also designed to determine if any strategic or tactical goals were included, and how the pre-plans are stored and retrieved, and how often they are utilized. The type of department and type of jurisdiction were also identified. The

final question of the survey asked for any additional comments or suggestions. The results of the survey provided answers to research question 2 and 3.

The results of the external survey (Appendix D) identified how other fire departments were performing pre-fire planning. There were 147 surveys returned out of a possible 248 for a 59% participation rate. Out of the 147 departments that responded 98 (66%) were career departments, 42 (28%) were from combination departments, and 7 (4%) were from volunteer fire departments. Eighty-one (55%) clarified their departments as protecting an urban area, 65 (44%) protected a suburban area, and 32 (22%) protected a rural area. Several of the respondents were county services and answered this question as protecting more than one type of jurisdiction.

There were 135 (92%) of the departments surveyed that indicated they performed some type of pre-planning, while 12 (8%) stated they did not perform any type of pre-plan program. Of the departments that indicated they performed pre-planning 9 (6%) stated they conducted pre-plans every six months, 72 (49%) stated every year, 59 (40%) whenever deficiencies were found, 6 (4%) stated never perform pre-plans, and18 (12%) had other responses. Again several departments answered multiple answers, due to the fact they performed pre-plans yearly and when deficiencies were found. Sixty-nine (47%) of the respondents stated they used computers to store their pre-plans, 109 (74%) stated they used three ring binders to store pre-plans, 3 (2%) used survey cards, and 19 (13%) used a combination to store pre-plans. Again, several departments answered more than one answer for the question, without indicating a combination answer.

The types of buildings the departments pre-planned identified from the surveys were: 122 (83%) target hazards, 98 (67%) high rises, 104 (71%) all commercial occupancies, 69 (47%) multi-family residential, and several departments mentioned buildings pertinent to their perspective areas.

Another question asked the departments if strategic or tactical goals were included on their pre-plans, 57 (39%) answered yes, 78 (53%) answered no, and 12 (8%) did not answer due to the fact they do not perform pre-planning.

The next question asked who creates the pre-plans, 47 (32%) answered company officers, 32 (21%) answered on duty personnel, 14 (10%) responded firefighters and fire inspectors, 11 (7%) answered fire prevention, 6 (4%) answered shift commanders, 5 (3%) answered preplan officers, 3 (2%) responded chief officers, 2 (1%) answered training division, and 27 (18%) did not answer.

The next question asked if they use a commercial computer program to aid in their pre-plan program, 69 (47%) stated they did use a commercial program, 66 (45%) stated they did not use a commercial program, and 12 (8%) again do not perform pre-planning. Not every department identified the program they utilized, but 24 (35%) used Microsoft's Visio, and 21 (30%) were using CAD Zone's Fire Zone.

Another question asked where are the pre-plans carried, 134 (91%) stated carried on fire apparatus, 114 (78%) responded carried on chief officer vehicles, 51 (37%) stated carried on rescue vehicles, and 15 (10%) responded they were carried on other vehicles, with no description.

The next two questions of the survey gauged the departments' use and value of a pre-fire planning program. The respondents were asked how often the pre-fire plans were utilized for emergency calls, 10 (7%) responded always, 59 (40%) answered regularly, 62 (42%) responded seldom, 4 (3%) answered never, and again 12 (8%) do not perform pre-fire planning. The chiefs were then asked if they felt pre-fire planning was important, 147 (100%) responded by saying yes.

The final question of the external survey asked for comments or suggestions. Nine departments asked for the results of the survey to be forwarded to them. Eight stated they were in

the process of updating or upgrading their current system this year. Three respondents sent copies of their pre-plans, and finally there were many surveys returned with no comments.

The internal survey was developed for the uniformed personnel of BRFRS to express their views and opinions on a pre-plan program. This survey was also designed for BRFRS personnel to identify what significant criteria should be included in pre-plans for BRFRS. The results of the survey provided the following answers to research question 4.

The first question asked if they considered a pre-plan program a benefit for the department, 155 (97%) responded yes, while 5 (3%) responded no. The second question asked if they thought tactical procedures should be included in the pre-plan, 68 (42%) answered yes, and 92 (58%) responded no.

The next question contained 14 dimensions for BRFRS personnel to rate the significance of being included into a pre-plan. They rated easy access to all building surveys the highest, and fire flow requirements the lowest, which was still moderately important. The overall scores were scored from 2.98 to 3.83. The complete results appear in Appendix F.

Discussion

The results indicate that there is a need for a pre-plan program for all jurisdictions throughout the fire service and in particular BRFRS. According to Massey (2004) “without a pre-plan, the chief will be forced to make critical life-and-death decisions based on guesswork and that can prove disastrous” (p. 102). Terpak (2002) stated, “Waiting to gather information until the fire department arrives at an incident often proves to be reactive, unprofessional, and unproductive” (p. 69). Smoke (1999) wrote, “Preplanning benefits everyone involved with the event and contributes to more effective and safe incident management” (p. 290).

While accomplishing the research it was noted that pre-fire planning goes by many names which include but are not limited to: pre-incident planning, pre-incident intelligence, and pre-plans, preemergency planning, and pre-fire analysis. But, one thing they had in common was they all contain information about a occupancy or hazard to assist the firefighter in performing their job. Bachman (2000) stated, "Preincident intelligence – commonly known as preincident planning, preincident survey, or risk assessment – is a vital fire department resource. Its objective is to identify hazards and response limitations in your community" (p. 87).

The National Fire Protection Association (NFPA) 1620 (2003 edition) defines pre-incident plan as "A document developed by gathering general and detailed data used by responding personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specified facility" (p. 1620-6). In his book Smoke (1999) asserted that "Preemergency planning is a process of preparing a plan for emergency operations at a given occupancy or hazard" (p. 289). The IAFC and the NFPA (2004) defines "preincident planning is the process of obtaining information about a building or a property and storing the information in a system so that it can be retrieved quickly for future reference" (p. 648). "Pre-incident surveys provide knowledge of building construction, hazardous materials storage, building layout, special processes, fire notification and suppression features, and occupancy concerns" (International Fire Service Training Association [IFSTA], 1998, p. 662). In his article James Mason (2004) spoke about preplanning and what it should entail. Preplanning should include three fireground size-up concerns. The first being how the building is built and how it will behave during the extreme heat and smoke from fire. The second is the occupancy, which will point out the number of potential victims that may be inside and their possible locations. The third is the building layout and how it will effect the hose reach and search and rescue operations. (p. 63)

"The firefighter's responsibility… begins at the firehouse with training and pre-planning. Familiarization with each buildings system in your district is a must and every firefighter should have a working knowledge of that system" (Klett, 2004, ¶ 2). Ben Klaene and Russ Sanders (2000) state, "a plan describes important building features, life safety considerations, extinguishment factors, and general information about the building" (p. 20). Bachman (2000) states, "Knowing the hazards and types of construction in your protection area determines the type of equipment you will maintain and the areas of training you will emphasize" (p. 87). According to Pisciotta (2000) "information is collected, evaluated, and documented and is stored in a retrieval format so it can be used for future reference. Ideally, the information is periodically reviewed and updated" (p. 79).

To place firefighters into an occupancy or hazard without the proper pre-plan or training is a disservice to the employee, their co-workers and the citizens they serve. We must provide all the necessary leadership and guidance, while adhering, or staying as close as possible to the NFPA standards in developing, implementing or recreating a pre-plan program. To provide the best feasible customer service, we must start with our internal customers by providing the best possible training and the latest techniques and technologies available. This includes pre-planning. "Having preincident plans available is like a coach having the play book at a game" (Angle, Gala, Harlow, Lombardo, Maciuba, 2001, p. 121). In an article obtained from the Internet Sendelbach (2004) stated:

> Knowing your enemy is a rule every firefighter and fireground commander should live by. No fireground can ever be made entirely safe, but it goes without saying, if we know the enemy up front the odds of winning the war are dramatically increased in our favor. (Lesson #1 Preparation/Planning Section, ¶ 3)

No matter what it is called, the many different sources utilized for the literature review all define pre-planning basically the same, as a plan that firefighters put together that gives them relevant detail regarding a hazard or occupancy that will assist in their response to mitigate an emergency at that location. The chiefs or their representatives of 135 fire departments responded that they are performing some type of pre-fire planning; also 147 representatives indicated that they felt a pre-fire planning program is important. In addition, 155 BRFRS personnel responded that pre-planning is a benefit to the department. These three questions illustrate the importance of a pre-plan program.

Subsequently, the next research question asked how other fire departments are performing pre-fire planning. In his article Lathrop (2003) stated, "Many fire departments have poor or no preplanning programs. … However, that does not change the fact that many fire departments lack effective preplans. Others have a very difficult time keeping preplans or in-service inspections current" (p. 80). The research indicated several facts that apply to BRFRS and many other departments. Many departments may have performed pre-fire plans previously, but due to an increase in call volume, training requirements and other tasks or programs that the fire service pursues, limit the amount of time available to perform pre-planning. Some departments will only conduct pre-fire plans on buildings and not prepare for other types of emergencies like hazardous materials release, mass casualty incidents, terrorist attack, or a natural disaster. Yet, other departments will complete the pre-plans but never train or test the pre-plans to ensure that they are workable, or ever revisit occupancy or hazard to update the pre-plan.

Central Kitsap Fire and Rescue has a good pre-fire planning program, the firefighters are assigned buildings, gather all pertinent data and develop the plans. The firefighters also complete drawings to scale with a computer aided design program (Tague, 2004, ¶ 2). Val Codino (2004)

stated, “Central Kitsap Fire & Rescue is fitting its apparatus with ruggedized computers and pre-fire planning software so crews can respond to fires with better information that is easy to access” (p. 160).

In a survey retrieved from the Internet conducted by Fire Engineering (2004) showed “All departments choose high-hazard locations for preplanning, but does your department preplan its responses to less assuming target hazards such as remote pumping stations or utility stations? 44.68% responded yes, while 55.32% responded no” (¶ 1). In another survey retrieved from the Internet conducted by Firehouse.com (2002, ¶ 1) illustrated:

> How often does your department update and or check the corrections of pre-fire plans? Out of 7414 total votes, 6.5% responded monthly, 44.1% responded annually, 6.6% responded every 2 years, 16.1% responded greater than 2 years, and 26.5% responded never or other or N/A.

As indicated by Bennett (1999) “The Phoenix Fire Department was perhaps the leader in the computerization of pre-fire planning” (p. 8). As stated in the Standard Operating Procedures of the Phoenix Fire Department (2002, ¶ 1 - 6) pre-incident planning gives firefighters relevant detail regarding a building that will assist in their response to an emergency at that location. The information consists of fire protection concerns, building layout, construction details, fire protection systems, and any other data that could influence strategies and tactics during the emergency. Anderson (2002, ¶ 3) stated, “In the Phoenix Fire Department, we use computer-aided dispatch (CAD), mobile data terminals (MDT’s) and mobile computer systems to do this.”

In an article found on the Internet, Houston Fire Department (2000) website states, “Emergency Operations Command personnel are not involved in the inspection duties or code enforcement. However they are responsible for pre-fire planning (Tactical Assessment and

Evaluation Plans), pre-incident apartment diagramming, and High-rise surveys" (¶ 4). In an article retrieved from the Internet from the City of Franklin, TN Fire Department (2004) it stated: "Pre-fire planning inspections are part of the job functions performed by the shift personnel. …Firefighters strive to complete pre-fire planning inspections of all commercial, industrial, institutional, and other similar type buildings twice a year" (Fire Prevention section, ¶ 1). Another article retrieved on the Internet from the Cork City Fire Brigade, Ireland (2002) stated, "personnel in each fire station should have readily available to them relevant information as to the buildings in their area which prevent special risks …Pre-incident planning is carried out by fire crews visiting different premises on a systematic basis" (Pre Incident Planning section, ¶ 1).

There are many ways of pre-planning, and many innovative ideas in pre-planning. Burnham (1998) stated, "Assuming you're the Milwaukie (Ore.) Fire Department, you hire students from the nearby Sabin Skills Center to create the plans with easy-to-use drawing software" (p. 80). In their article Finucane and Price (2002) stated, "To help ensure better response times, the Johnson City (TN) Fire Department has mounted large color-coded maps of the VA Center and the local university, … on the fire station walls. …in a prefire planning notebook on the apparatus" (p. 113).

Codino (2004) stated:

> LaVecchia answered by making pre-fire planning not just a top priority for his personnel, but part of the department's culture. … The result of this aggressive approach is that Milford has achieved a Class 1 rating by the Insurance Service Offices Inc. (ISO). (p. 157)

Many departments conduct pre-plans in many different ways, but the outcome is basically the same which is a plan developed to assist the firefighters on an emergency scene. As indicated by the external survey, over 50% of the departments have company officers or on duty crews that

create the pre-plans. In addition more departments are beginning to utilize more advanced technologies than ever before.

The third question inquired about what new technology is available for pre-fire planning. With the computer age, today modern technology has brought about numerous changes and capabilities to computer systems. Some of these changes are hardware as in touch screen MDTs or vehicle mounted laptop computers, and some are software programs that have been developed to assist in the storage and retrieval of pre-incident plans. Wolf (2003) stated, "There is a saying that the fire service is '200 years of tradition unimpeded by progress'" (p. 74). Lohner (2003) stated:

> Pre-fire and pre-incident planning were important tasks prior to Sept. 11, 2001. However, in the wake of increased terrorist threats and the ongoing war on terrorism, pre-fire planning has become critically vital. …Fortunately, computer technology is playing a pivotal role in the preparation of pre-incident diagrams. (p. 10)

In his article Wolf (2003) stated, "The fire service is on the cusp of an electronic frontier in the use of concepts such as eCommerce and eBusiness to create a new way of providing traditional fire services" (p. 73). Although not many departments have embraced this technology as noted in another survey retrieved from the Internet conducted by Firehouse.com (2000) showed:

> Does your department utilize onboard computer systems to assist in response and pre-planning? Out of 4987 total votes, 3.7% yes response only, 7.8% responded yes variety of other functions, 32.5% responded no but being planned, 50.9% responded no, no intention, and 5.1% responded N/A.

"Computerization has also affected the operations of fire fighting. Fire apparatus and chief officer vehicles are equipped with computers that provide immediate access to CAD, hazardous materials references, pre-fire plans and accountability systems" (Werner, 2001, Computers section,

¶ 3). According to Cook (2001) "Computers – fast becoming the preferred pre-plan-storage method – make it significantly easier to organize pre-plans" (p. 61). In his article Anderson (2002) discusses about the computer program that was written for the Phoenix Fire Department. The program was particularly written for portable use for firefighters, easily transferable to other programs, consistent user interface, and the pre-fire plan information would be stored on the computers hard drive (What We Got section, ¶ 1).

GIS technology is one type of another tool that is available to assist departments in pre-fire planning. "Using onboard hard drives that are updated every month, the gis software lets the firefighter use icons and a touch-screen interface to retrieve diagrams, floor plans and document imaging details on pre-fire survey information" (Elliott, 2000, ¶ 13). GIS is just right for pre-fire planning, by assisting in analyzing and displaying building locations, hazardous material locations, hydrant locations, and other vital information.

Another tool or technology advancement available for pre-fire planning is called Pictometry. Parow (2003) stated, "Pictometry, … has developed a visual intelligence system that uses aerial photography imaging to capture, process, and analyze orthogonal (straight down) and oblique (taken from angles) images to create an aerial '3-D map' of a given area or location" (p. 95). The Pictometry imagery displays features such as buildings, neighborhoods, and roads to be viewed from several directions and at different scales. It will allow a firefighter to easily locate and correctly measure any feature, and the system is GPS based.

Another idea that could be utilized is HTML based pre-fire plans. Cook (2001) found:

> Everyone knows how to use the Internet, so why not create preplans in the same format as Web Pages using HTML formatting? …I developed a system based on the following criteria:

- Preplans should allow users quick access to the Info;
- Preplans should be simple to use, requiring only a touchscreen, mouse or other pointing device;
- Preplans should allow easy updates and maintenance; and
- Preplans should be thorough.

With these basic ideas to build on, I decided local files of HTML-based preplans stored on laptops or mobile data computers (MDC) would prove the fastest and cheapest. (p. 61)

Several computer-based programs have been developed and are available to assist in completing and storing pre-fire plans. One of the developers is Cad Zone Incorporated. Cad Zone has two programs to assist in the pre-fire planning process. The first is The Fire Zone, which is CAD driven and allows departments to produce comprehensive drawings of facilities in their response area. The second is First Look Pro, which is designed to organize all the information or data on a building along with the drawings that were created in The Fire Zone (The CAD Zone, n.d.). Codino (2004) wrote, "First Look Pro complements The Fire Zone by letting fire personnel organize and locate pre-fire plan diagrams and information within seconds" (p. 158). Another program available with many different applications including pre-fire planning is Firehouse Software® suite. The pre-plan module is a database that allows firefighters to store extensive preplan information. The program does not have a drawing component, but it is able to import attachments to view pictures and drawings (Firehouse Software®, n.d.). Another software on hand is FDM software. They currently offer a comprehensive CAD and records management software solutions that contain one module that is a database module for properties, which is the foundation for all permit, incident and inspection data (FDM software, n.d.). Microsoft has a diagramming program available called Visio. Visio 2003 is a diagramming

program that can help you create business and technical diagrams that document and organize complex ideas, processes, and systems. Diagrams created in Visio 2003 enable you to visualize and communicate information clearly, concisely, and effectively in ways that text and numbers cannot. Visio 2003 also automates data visualization by synchronizing directly with data sources to provide up-to-date diagrams, and it can be customized to meet the needs of your organization (Microsoft, n.d.).

In the external survey the Fire Chiefs responded by saying 46% utilized various commercial computer programs to assist in their department's pre-plan program. Two programs were utilized mainly with 35% using Microsoft's Visio, and 30% using CAD Zone's Fire Zone.

Massey (2004) wrote, "You're now dealing with emergencies in the 21st century, in the most dangerous times for the fire service. Every 'tool' you have at your disposal must be utilized" (p. 102).

According to the internal survey there were nearly 60% of all the respondents that replied indicated computers should be utilized for pre-plans. Out of that 60%, 31% wrote that they desired portable printers to print the information on scene. These numbers illustrate the importance that the members of BRFRS place on technology and the computer system and it's use. The internal survey also indicated that BRFRS personnel rated easy access to all building surveys as the highest significance to a pre-plan program.

The fourth and final question requested what elements do members of BRFRS desire in a pre-plan program. Cook (2001) stated, "Ease is the key to get the troops to use the system and low cost is the key to get administration to loosen the purse strings" (p. 65). Lathrop (2003) found that "One of the best ways to help is to keep it simple, keep it logical, consider all variables, and remember the person who has to use the system during an emergency" (p. 89).

"Heeding the words of Phoenix Fire Chief Alan Brunacini: 'Filing, storing, and finding preplans presents many functional and practical problems. Simply, if you can't find it, you can't use'" (Anderson, 2002, What's Next section, ¶ 1). In the internal survey 57% replied that they wanted quick and easy access to the pre-plans.

In *NFPA 1620 Recommended Practice for Pre-Incident Planning* (2003) it discusses the need for a system that permits it to be retrieved without difficulty while responding to emergencies in the apparatus (NFPA, 2003, p. 1620 – 9.1). Klaene and Sanders (2000) stated, "Pre-incident planning provides a way to protect firefighters and better serve the community. These plans should include information important to the incident commander, and they should be current, correct, and accessible at the emergency scene" (p. 98).

According to Clark (1991) "Pre-fire planning will identify major problems, prescribe what is needed to meet them, and provide for meeting such needs. A pre-fire plan should not go too deeply into step-by-step actions" (p. 285). Kansky (1995) stated, "The main goal of pre-planning is to have a game plan ready before it's needed. Having correct and updated pre-plans in place means that fireground operations can be conducted safely and efficiently" (p. 47).

The NFPA (2003) also stated:

> The following factors should be evaluated when assessing the potential situations that could affect a facility during emergency conditions:
>
> - Construction
> - Occupant characteristics
> - Protection systems
> - Capabilities of public or industrial responding personnel
> - Availability of mutual aid

- Water supply
- Exposure factors (p. 1620-7)

Bachman (2001) found, “Preincident surveying is a never ending task. You must constantly monitor facilities for physical and administrative changes” (p. 72). In another article from Bachman (2003) he stated, “Do not become complacent just because you have gathered preincident intelligence on a facility. Continually process the information, practice during exercises, and regularly revisit facilities to ensure you have the most accurate information” (Applying The Lessons section, ¶ 4).

Lathrop (2003) discusses that some of the particulars of the buildings could be forgotten, even if you have returned to resurvey the property. In addition, it is very lengthy and near impossible to make all shifts know the buildings inside and out (p. 80). Naylis (1998) found, “Having more than a basic or cursory knowledge of a building and its contents is a matter of survival for the firefighter” (p. 28).

Again the internal survey indicated that BRFRS personnel rated easy access to all building surveys as the highest significance to a pre-plan program with a score of 3.83. The next highest rated criterion was that of a list of hazards present with a score of 3.82. BRFRS personnel indicated that most if not all of the criteria listed on the survey were important to a pre-plan. Out of the 14 dimensions only one was rated fewer than 3.0 that being the fire flow requirement.

The results clearly demonstrated that there are many ways to perform pre-planning, and the need for a pre-plan program. The development of a program should incorporate a combination of the current NFPA standard 1620, along with available software programs.

The results of both the external and internal survey reinforce the literature review and this writer’s opinion that a pre-plan program is of importance for BRFRS. One hundred percent of the

Chiefs surveyed, with the external survey acknowledged that a pre-plan program was important. In addition, ninety-two percent of the departments surveyed do perform some type of pre-plan program. Forty-seven percent out of those departments documented that they were using computers for storing their pre-plans; another 13% stated they were using a combination of computers and hard copies.

The organizational implications for BRFRS are that there is a need for a formal pre-plan program. A pre-plan program will increase the effectiveness, efficiency, and safety of the services that BRFRS provides to its internal and external customers. This research paper has presented the information necessary in implementing an up to date pre-plan program for BRFRS.

Recommendations

The problem as already stated was that BRFRS does not presently make use of a formal pre-fire planning program. The fire service today has progressed into a more proactive, rather than a reactive organization in many facets. The purpose of this ARP is to clarify the need for a formal pre-fire planning program and to offer recommendations on an improved system to assist BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through pre-fire planning.

Based on the research presented in this study a need has been verified that BRFRS shall develop a formal improved pre-fire planning program. In accordance with the findings from the literature review, surveys and the study of these findings, the following recommendations have been designed.

- Attain backing from the Fire Chief, members of the department and the union to reinstitute a Pre-Plan Program for potential BRFRS.

- Choose personnel to work on a Pre-Plan Development committee that will conduct further research, design and implement the Program.
- The Pre-Plans should be based on NFPA 1620 R*ecommended Practice for Pre-Incident Planning*.
- All pre-plans should be installed or available on every BRFRS computer, and be capable of printing the pre-plan in the apparatus.
- After completion and implementation of the Pre-Plan Program, the program should be continually evaluated and modified when corrections are required, the plans should also be updated regularly.
- Further research should be conducted and a continuing education class on pre-plans should be instituted for all existing company officers.

The following general guidelines according to NFPA 1620 should be evaluated when performing the Pre-Plan Program:

- Construction
- Occupant characteristics
- Protection systems
- Capabilities of responding personnel
- Availability of mutual aid
- Water supply
- Exposure factors

This is a general list and not meant to be comprehensive; it should be built upon further to provide the best possible pre-plan.

The Pre-Plan Program should be implemented as soon as possible. The approval for the project, selection of a committee and development of the program will take approximately 6 months to one year. Implementation will take approximately another three months. Unfortunately, the process will start and so will the budgetary process for fiscal year 2006. The program will not be ready for any budget requests for next year. However, the continuing education training for company officers can be scheduled, and the information gathering of all the occupancies and hazards can begin.

Feagley (1992) stated, "An absence of preplans can be disastrous. (Prior proper planning prevents poor performance.) Safety and success on the fireground depend to a large degree on having available adequate and appropriate training resources to meet the demands of the emergency" (P. 124). "There is an old expression: 'Proper preplanning prevents poor performance.' For firefighters, proper prefire planning can prevent injured and dead firefighters" (Knapp, 1998, Lessons learned section ¶ 6). Bennett (1999) wrote, "Looking back at major incidents that resulted in firefighter injuries and deaths, it doesn't take a genius to conclude that, if those firefighters had more pre-incident information, they might have survived the incident" (p. 8). As leaders in the fire service today it is imperative that we encourage all members of the fire service regarding the value of pre-planning. Smith (1998) stated:

> If we don't plan for emergencies, we cannot deal with them effectively. Pre-planning allows a fire department to be forewarned; to be forewarned is to be prepared. Once problems are identified, the way has been paved for successful emergency operations. (p. 22)

In conclusion, future readers of this ARP should understand that proper training and a well-planned pre-plan program will help the company officers and fire departments to meet the challenges of today and tomorrow. This will help ensure that both internal and external

customers receive the best and safest possible service. For the pre-plan program to succeed, all members of BRFRS, or any other department that institutes a pre-plan program will need all its members to endorse the program completely. By looking beyond to the potential reduction of injuries and or deaths to civilians and or firefighters by being as prepared as possible for the present.

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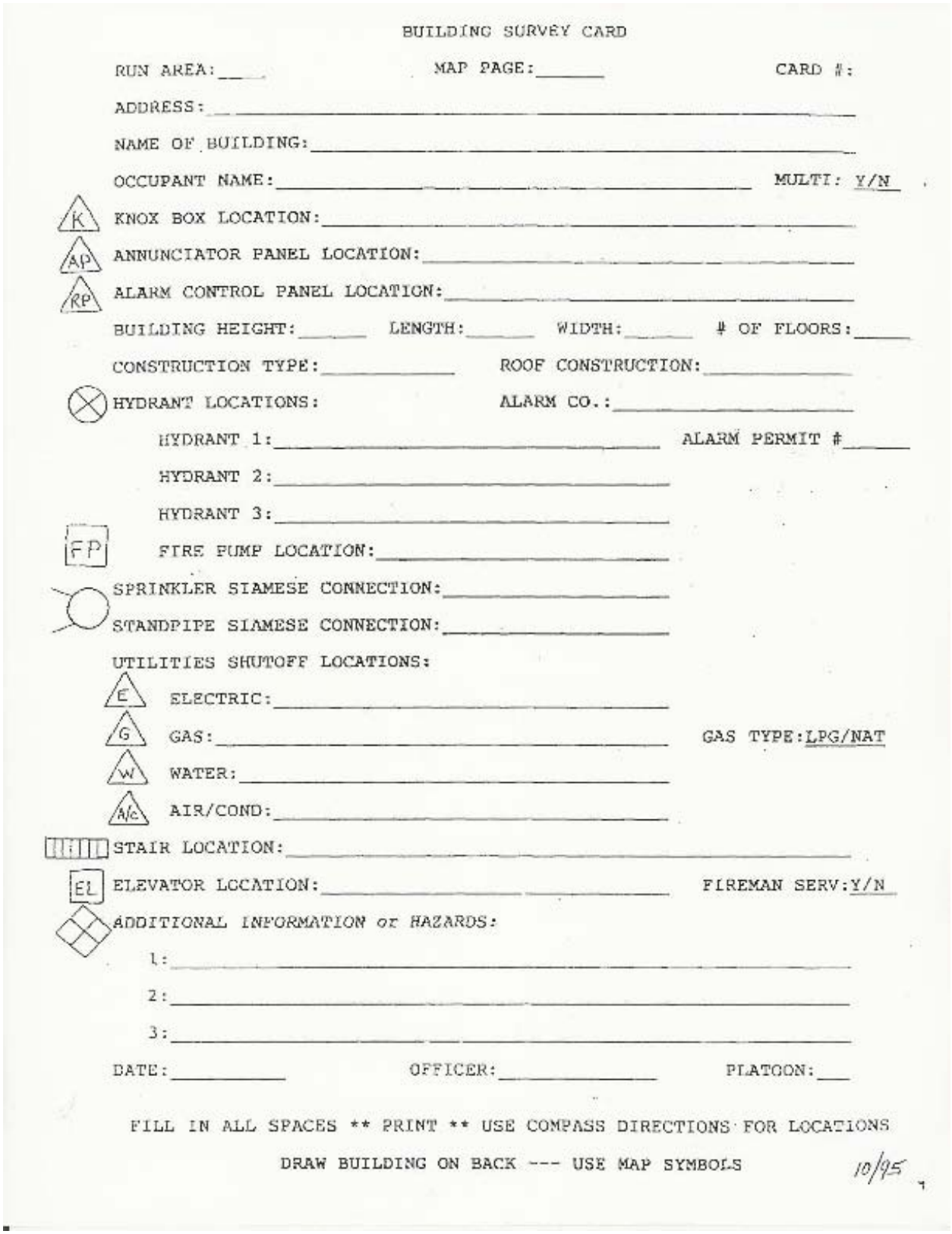
Appendix A



BUILDING SURVEY CARD

RUN AREA:____ MAP PAGE:_____ CARD #:

ADDRESS:_____

NAME OF BUILDING:_____

OCCUPANT NAME:_____ MULTI: Y/N

K KNOX BOX LOCATION:_____

AP ANNUNCIATOR PANEL LOCATION:_____

RP ALARM CONTROL PANEL LOCATION:_____

BUILDING HEIGHT:_____ LENGTH:_____ WIDTH:_____ # OF FLOORS:_____

CONSTRUCTION TYPE:_____ ROOF CONSTRUCTION:_____

HYDRANT LOCATIONS: ALARM CO.:_____

HYDRANT 1:_____ ALARM PERMIT #_____

HYDRANT 2:_____

HYDRANT 3:_____

FP FIRE PUMP LOCATION:_____

SPRINKLER SIAMESE CONNECTION:_____

STANDPIPE SIAMESE CONNECTION:_____

UTILITIES SHUTOFF LOCATIONS:

E ELECTRIC:_____

G GAS:_____ GAS TYPE:LPG/NAT

W WATER:_____

A/C AIR/COND:_____

STAIR LOCATION:_____

EL ELEVATOR LOCATION:_____ FIREMAN SERV:Y/N

ADDITIONAL INFORMATION or HAZARDS:

1:_____

2:_____

3:_____

DATE:_____ OFFICER:_____ PLATOON:___

FILL IN ALL SPACES ** PRINT ** USE COMPASS DIRECTIONS FOR LOCATIONS

DRAW BUILDING ON BACK --- USE MAP SYMBOLS 10/95

Appendix B

BOCA RATON HOTEL & CLUB
MAIN BUILDING

1ST DUE - will locate at a position near the origin of the emergency as indicated by dispatch & assume command. The 1st due unit wil be responsible for the initial investigation.

2ND DUE - will stage on side C, next to the hydrant / standpipe in the loading dock area. The LT.. will be responsible for verifying the location of the alarm by checking the annunciator panel in the security office.

3RD DUE - will stage at the location that the IC indicates.

RESCUE - will locate with the 1st due unit and report to the IC.

SO-51 - will stage at the location the IC indicates.

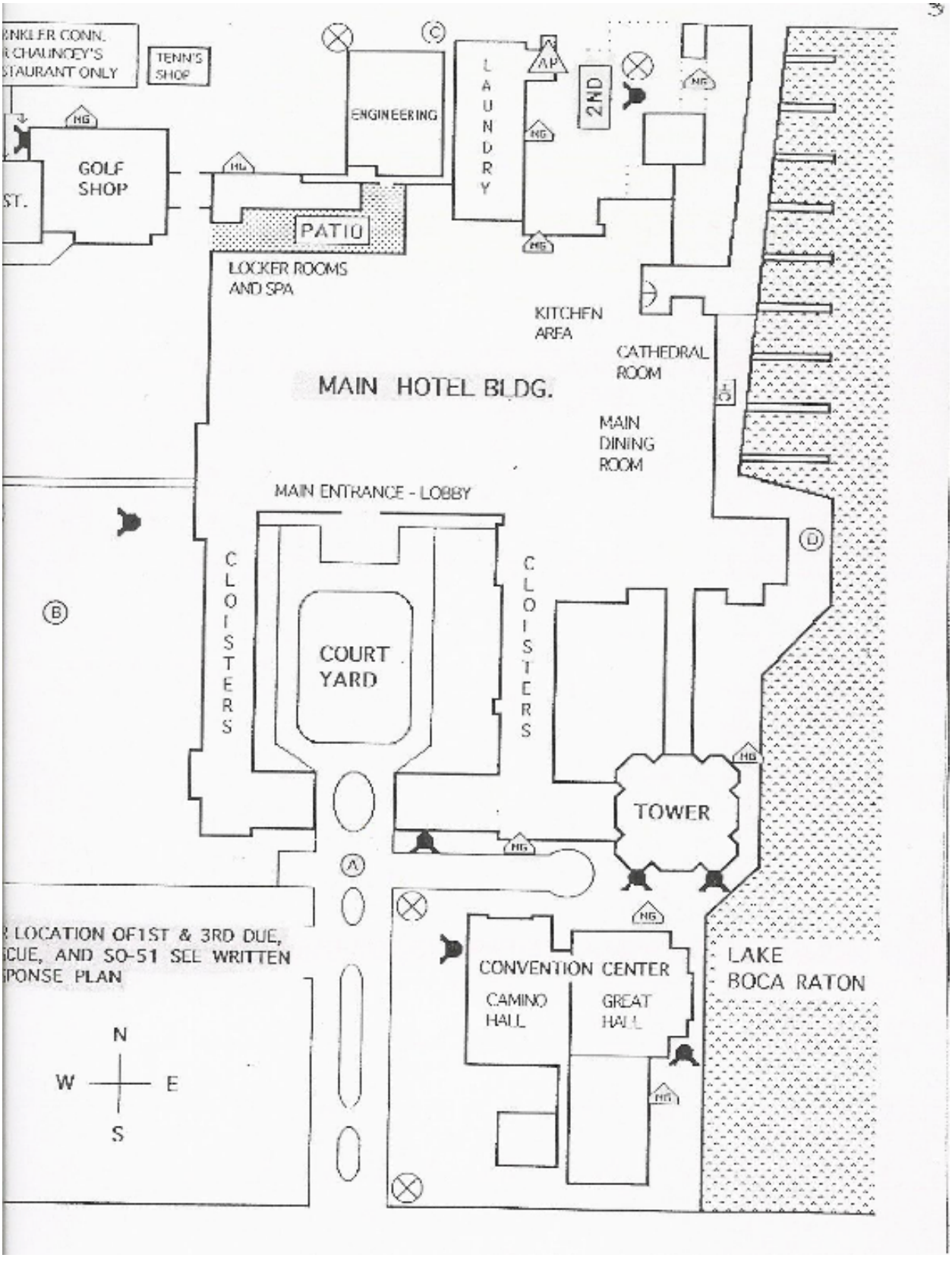
2E10 - will consider a command post location & assume command if necessary.

ADDITIONAL INFORMATION

3 Sprinkler / standpipe locations - side A, south side, east of guard house
side B, west side bldg. entrance
side C, north side in loading dock area

Annunciator / alarm panel location - side C, in security office

Appendix B


TENN'S SHOP
ENGINEERING
LAUNDRY
AP
2ND
GOLF SHOP
PATIO
LOCKER ROOMS AND SPA
KITCHEN AREA
CATHEDRAL ROOM
MAIN HOTEL BLDG.
MAIN DINING ROOM
MAIN ENTRANCE - LOBBY
CLOISTERS
COURT YARD
CLOISTERS
TOWER
CONVENTION CENTER
CAMINO HALL
GREAT HALL
LAKE BOCA RATON
N
W
E
S

City of Boca Raton

FIRE-RESCUE SERVICES DEPARTMENT • 2333 WEST GLADES ROAD • BOCA RATON, FLORIDA 33431-7311
PHONE: (561) 367-6700
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(FOR HEARING IMPAIRED) TDD: (561) 367-6742
SUNCOM: (561) 922-6700

Appendix C

January 2, 2005

Dear Chief,

I am currently completing a research study as part of a course requirement for my Leading Community Risk Reduction Course at the National Fire Academy. As part of my research I am conducting a survey, which I have enclosed.

I would ask that you, or someone that you designate, complete this survey and return it to me either by mail or by fax at (561) 995-2103, by January 28, 2005. The information compiled by this survey will be combined with information from other departments from around the State. The compiled information will then be used to complete the research and assist my department and me in developing an improved formal pre-fire planning program.

Thank you in advance for your time and consideration. If you would like a copy of the compiled information, please make a note of that fact on the survey form and include your name and mailing address or an e-mail address.

Sincerely,

Daryl L. Scott, Division Chief
Training & Safety Division
Boca Raton Fire Rescue Services

Appendix D

Pre-Plan Survey

1. Does your Department perform any type of formal pre-planning program?
   Yes 135 = 92% No 12 = 8% If No skip to question #10
2. What types of buildings does your Department pre-plan? Check all that apply
   122 = 83% Target Hazards
   98 = 67% High Rises
   104 = 71% All Commercial Occupancies
   69 = 47% Multi-family Residential
   12 = 8% Other (please specify) Varies
3. Do all pre-plans include strategic or tactical goals? Yes 57 = 39% No 78 = 53%
4. Who creates your pre-plans? Varies
5. How often are your pre-plans reviewed and updated? 9 = 6% Six Months, 72 = 49% Yearly, 59 = 40% As deficiencies are found, 6 = 4% Never, 18 = 12% Other Varies
6. How are your pre-plans stored? 109 = 74% Three ring binder, 3 = 2% Survey Cards, 69 = 47% Computer, 19 = 13% Combination, 0 = 0% Other None stated
7. Do you use a commercial computer program to aid in your pre-planning program?
   Yes 69 = 47% No 66 = 45% If Yes name the program Various programs
8. Where are the pre-plans carried? 134 =91% Fire Apparatus, 114 =78% Chief Officers Vehicles, 51 = 37% Rescue Vehicles, 15 = 10% Other None stated
9. Are your pre-fire plans utilized for emergency calls?
   10 = 7% Always, 59 = 40% Regularly, 62 = 42% Seldom, 4 = 3% Never
10. Do you feel a Pre-Fire Planning program is important? Yes147 = 100 %, No 0 = 0%
11. What type of jurisdiction do you protect? 81 =55% Urban, 65 = 44% Suburban, 32 =22% Rural
12. What type of Fire Department do you represent?
    98 = 66% Career, 42 = 28% Combination, 7 = 4% Volunteer
13. Name of Department (optional)? _____

Additional comments/suggestions 9 departments asked for results, 8 stated in process of updating, 3 sent copies of their departments pre-plans, several stated good luck, and many returned with no comments.

Appendix E

Pre-Plan Survey

1. Do you consider a pre-plan program a benefit for the department? Yes 155 = 97% No 5 = 3%
2. Do you think tactical procedures should be included in the pre-plan? Yes 68=42% No 92=58%
3. Please rate the following criteria on their significance of being included in the pre-plan utilizing the following scale:

   1 = not important

   2 = somewhat important

   3 = important

   4 = very important

Complete building construction	1	2	3	4
Building dimensions and square footage	1	2	3	4
Building features	1	2	3	4
Exposures	1	2	3	4
Building contents and processes	1	2	3	4
A list of hazards present	1	2	3	4
All access points	1	2	3	4
All ventilation points	1	2	3	4
Fire protection features and locations	1	2	3	4
Type and location of all utilities	1	2	3	4
Fire flow requirement	1	2	3	4
Water supply – location and limitations	1	2	3	4
Emergency contact information	1	2	3	4
Easy access to all building surveys	1	2	3	4

4. How should these plans be accessed? 31 = 19% Three ring binder, 6 = 4% Survey Cards, 111 = 69% Computer, 64 = 40% Combination, 7 = 4% Other- none stated
5. Where should the pre-plans be carried? 77 = 48% Fire Apparatus, 54 = 34% Chief Officers Vehicles, 37 = 23% Rescue Vehicles, 114 = 71% All vehicles, 4 = 3% Other- none stated
6. What elements do you desire in a pre-plan program, so it will be readily utilized? _____

_____

_____

_____

Thank you for taking time in completing this survey

Appendix F

Results from Internal Survey

14 dimensions rating the significance of criteria of being included in pre-plans

- 160 Uniform Personnel completed this survey
- Rating Scale 1 = Not Important, 2 = Somewhat Important, 3 = Important, 4 = Very Important
- 1.0 Average would represent a Not Important Criteria
- 2.0 Average would represent a Somewhat Important Criteria
- 3.0 Average would represent a Important Criteria
- 4.0 Average would represent a Very Important Criteria
- 640 Maximum Points per Dimension. 160 Uniformed Personnel x 4 points = 640

Criteria	Total Points	Average Score
Complete building construction	553	3.46
Building dimensions & square footage	517	3.23
Building features	560	3.50
Exposures	536	3.35
Building contents and processes	585	3.66
A list of hazards	611	3.82
All access points	599	3.74
All ventilation points	554	3.46
Fire protection features & locations	596	3.73
Type & location of all utilities	575	3.59
Fire flow requirements	477	2.98
Water supply-location & limitations	576	3.60
Emergency contact information	526	3.29
Easy access to all building surveys	612	3.83