Pre-Incident Planning: The Cavalry of the American Fire Service

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Appendices Not Included. Please visit the Learning Resource Center on the Web at http://www.lrc.dhs.gov/ to learn how to obtain this report in its entirety through Interlibrary Loan.
CERTIFICATION STATEMENT

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

Signed: ________________________________
Abstract
Cobb County Fire and Emergency Services identified 3200 commercial structures as target hazards that presented a greater than normal risk to the citizen or firefighter during emergency operations. An annual pre-incident plan and walk-through has been required for these structures. The completion of pre-incident plans has not been performed by CCFES company officers at a level that has provided adequate information that enabled the officer or incident commander to quickly and easily identify the hazards that affect the safety of occupants and firefighters in commercial buildings. The purpose of this research was to identify why the CCFES officer has not valued the pre-incident plan process and incorporated it into their training and operational activities. This project was completed with the descriptive method of research. This research identified, from the perspective of the company officer, why they have completed pre-incident plans; the strengths and weaknesses; the training received; the common practices to complete them, and what common critical items that were identified during a walk-through. Interviews and a survey were conducted with various CCFES personnel. The results of this project identified that there was not a common approach to conducting and completing pre-incident planning within CCFES. This was attributed to weak program support and a lack of training. On-the-job training has been the primary training method to learn pre-incident planning. Recommendations were to revise the current pre-incident plan policy to include current standards and risk assessment methods. Mandatory and continuing education and training was recommended for existing and upcoming company officers.
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Pre-Incident Planning: The Cavalry of the American Fire Service

Introduction

Historians generally agree that the turning point of the American Civil War occurred over three days in July of 1863 at the Battle of Gettysburg. The Army of Virginia led by General Robert E. Lee was defeated for the first time in the war and would never gain the advantage again (The History Place, 1996). The failure of the Army of Virginia is attributed to the lack of cavalry support during the first two days of the battle. Reportedly, General Lee stated to General Jeb Stuart, cavalry officer, “General you were the eyes of this Army, meant to screen us from the enemy’s cavalry and to report on the position of their main body. That mission was not fulfilled” (Shaara, 1974). It was the loss of intelligence of the enemy’s strength and position on the battlefield that is attributed to the loss by General Lee (The History Place).

For the fire service an epic battle is being fought in new types and styles of non-residential construction and often without the eyes of the cavalry; a well prepared pre-incident plan (PIP). The battle of the American Fire Service is reported annually by the United States Fire Administration (USFA) and the National Fire Protection Agency (NFPA). In 2009, firefighters in the United States responded to a fire in a structure every 65 seconds (Karter Jr, 2010). Karter in his report for the NFPA, *Fire Loss in the United States during 2009*, states 80% of the structure fires responded to by U.S. fire departments were in residential occupancies. The remaining 20% of structure fires occurred in non-residential structures: commercial, industrial, and public buildings. In 2009, a structure fire occurred for Cobb County Fire and Emergency Services (CCFES) on average every 23 hours and 6 minutes. On average the CCFES response to a non-residential building fire occurred every 4 days and 22 hours (Cobb County Fire and Emergency Services, 2010). These buildings represent the entrenched and well supplied Union Army at
Gettysburg, and fire officers are responding to battle in these buildings as General Lee and the Army of Virginia did at Gettysburg in July 1863, without the eyes of the cavalry; a well prepared PIP.

The increased size of the non-residential building requires a proportionate response in apparatus, appliances, tools, water supply, and personnel to safely and successfully control and extinguish a fire in these buildings. The consequences of not being prepared and having information available to adequately identify the correct strategy and tactics to extinguish a non-residential fire is well documented in multiple firefighter fatality investigation reports prepared by the National Institute for Occupational Safety and Health (NIOSH). No structure fire demonstrates the consequences of underestimating the fire and not having an adequate PIP than the Sofa Super Store fire that occurred on June 18, 2007; nine career firefighters lost their lives in a non-residential structure fire (National Institute for Occupational Safety and Health, 2009).

CCFES station personnel are currently required to pre-plan over 3200 non-residential (commercial) structures annually. The average number of buildings to be pre-planned by each of the 29 stations is 110 PIPs. The completion of PIPs within CCFES has become a ‘checklist’ process of telephone interviews, record management system updates, and administrative compliance. The problem is that PIPs have not been performed by CCFES company officers at a level that provides adequate information that enables the officer or incident commander to quickly and easily identify the hazards that affect the safety of occupants and firefighters in non-residential buildings. The purpose of this research was to identify why the CCFES officer has not valued the pre-incident plan process and incorporated it into their training and operational activities. Descriptive methodology was used to complete this research. All research questions were answered through personal interviews of company officers and other personnel and a web
based survey distributed to the CCFES company officers; lieutenants and captains. The research questions were:

1. What does the CCFES company officer identify as the primary reason for completing PIPs?
2. What strengths and weaknesses do CCFES company officers identify with the PIP process?
3. What is the source and level of training for the PIP process as perceived by CCFES company officer?
4. What are the common practices employed by CCFES officers when completing the various sections of the PIP and conducting the walk through of the building?
5. When conducting a PIP walk-through what do CCFES company officers identify as critical items and/or issues to be addressed and documented?

Background and Significance

CCFES strives to identify and achieve industry best practices in the delivery of all services to the community. In addition to these industry best practices the department has legal mandates and national standards requirements to meet. The organization employs a total of 642 sworn and 27 civilian positions. Due to recent budget reductions the department is currently 40 sworn and 2 civilian positions short of the full staffing level (CCFES, 2010). In order to reduce a revenue shortfall the Board of Commissioners authorized a early retirement in 2009, but mandated that the positions remain vacant until revenues returned to higher levels.

The support of the Cobb County Board of Commissioners and County Manager over the past decade has allowed the department to achieve national accreditation and maintain a county wide Insurance Services Office (ISO) rating. The department initially received national
accreditation on August 10, 2005 through the Center for Public Safety Excellence, Incorporated (CPSE); formerly the Commission on Fire Accreditation International (CFAI), and is currently seeking reaccreditation (Cobb County Fire and Emergency Services, 2006). The department has a county-wide Public Protection Classification (PPC) of 3, as rated by the Insurance Services Office (ISO) from the Fire Suppression Rating Schedule (FSRS) (S. Heaton, personal communication, January 15, 2009).

CCFES (2010, p. 9) is described as a ‘full service’ fire department responding to the following emergencies; a) fire suppression response; b) emergency medical services response; c) hazardous materials response; d) technical rope rescue response; e) heavy rescue response; f) search and rescue response; g) vehicle extrication response; and h) medical operations response. Fire Chief Samuel Heaton led the department through the development of a departmental vision and mission statement in 2009. Included in this document were core values and cultural commitments. A copy of this document is included in Appendix F. The mission of CCFES is that we exist to provide superior fire, rescue, and emergency services … by practicing prevention, planning, education, and training (CCFES, 2009). The relevance to this research is obvious, pre-incident planning can be practiced through prevention, planning, education, and training.

CCFES units responded to an average of 45,056 incidents annually from January 1, 2006 to December 31, 2009. This translates to an incident every 11 minutes and 40 seconds. Table 1 demonstrates the total number of incidents responded to annually by CCFES (2010, p. 79) during this time period.
Table 1

2006 – 2009 All Incidents

<table>
<thead>
<tr>
<th>Call Type</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>2,193</td>
<td>2,106</td>
<td>1,597</td>
<td>1,267</td>
<td>1,791</td>
</tr>
<tr>
<td>EMS/Rescue</td>
<td>24,351</td>
<td>24,262</td>
<td>24,692</td>
<td>25,011</td>
<td>24,579</td>
</tr>
<tr>
<td>Hazardous Condition (No Fire)</td>
<td>1,166</td>
<td>1,429</td>
<td>1,588</td>
<td>1,535</td>
<td>5,718</td>
</tr>
<tr>
<td>Other</td>
<td>16,650</td>
<td>18,415</td>
<td>17,489</td>
<td>16,471</td>
<td>17,256</td>
</tr>
<tr>
<td>Total Incidents</td>
<td>44,360</td>
<td>46,212</td>
<td>45,366</td>
<td>44,284</td>
<td>45,056</td>
</tr>
</tbody>
</table>

The primary responsibility of the CCFES company officer is to keep the crew and apparatus prepared to respond to an emergency request. A significant part of that responsibility is to assure the delivery of in-service training requirements to their assigned personnel. The required training hours are a significant task. The average firefighter must participate in 25 hours of training each month to meet certification and licensure requirements. This requires the company officer to prepare and coordinate delivery of an average of two and a half hours of training every shift. Table 2 provides a breakdown of the annual training hour requirements for CCFES personnel. This includes training hours for continuing education required by the Georgia Firefighters Standards and Training Council (GFSTC), Georgia Office of Emergency Medical Services (GOEMS), and ISO. There are additional training requirements for personnel assigned to a specialty team that are not included in this data.

Training is not the only responsibility of the company officer. In addition to training the following assignments/tasks must be completed as well; a) annual hydrant inspections; b) station chores; c) incident reports; d) personnel documentation; e) physical fitness; and e) pre-incident planning.
Table 2

Annual Training Hour Requirements

<table>
<thead>
<tr>
<th>Rank</th>
<th>GFSTC</th>
<th>GOEMS</th>
<th>ISOa</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefighter</td>
<td>24</td>
<td>20</td>
<td>279</td>
<td>0</td>
</tr>
<tr>
<td>Engineer</td>
<td>24</td>
<td>20</td>
<td>279</td>
<td>0</td>
</tr>
<tr>
<td>Officer</td>
<td>24</td>
<td>20</td>
<td>279</td>
<td>4b</td>
</tr>
</tbody>
</table>

Note: a. ISO only recognizes fire related training. EMS and most technical rescue are not credited. b. Officers are required to maintain Incident Safety Officer ProBoard certification. This is a 16 hour course every four years.

In the midst of the response volume and administrative duties of the company officer conducting pre-incident planning activities are viewed as one item on a long and growing assignment list. Each of these items has a priority and a deadline from headquarters. Recently promoted officers have complained that they arrived to their first station assignment and found that a large number of their assigned PIPs had not been updated for several years or a telephone interview was conducted to update contact information and business name only; an on-site visit and walk-through had not been conducted for many of the PIPs. Due to the amount of work already assigned to these new officers most of them continued the practice of telephone interviews to complete the PIPs on time.

The impact on the performance and safety from the lack of well prepared PIPs is decreased civilian and firefighter safety and survival and increased fire losses. A review of the NIOSH firefighter fatality reports from 2006 to 2009 demonstrates a disturbing trend in non-residential structure fires; every report involving a non-residential firefighter fatality cited a need for better PIPs. The breakdown of this trend can be seen in Table 3.
### NIOSH Firefighter Fatality Reports Review

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Reports</th>
<th>Structure Fires</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Residential</td>
<td>Non-residential</td>
</tr>
<tr>
<td>2006</td>
<td>28</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>2007</td>
<td>35</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>2008</td>
<td>36</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>2009</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

CCFES Policy *Section 6-22 Pre-Fire Plans (Pre-Incident Plans)* has been in effect since November 2008. This policy requires a PIP walk-through and information update be completed annually. Many company officers concede that this is not the practice. Many of the preplans are updated by firefighters calling the building occupant or owner and verifying contact information and requesting if any changes to the building have occurred in the past year. The Fire House Records Management System (FHRMS) PIP contact information is updated and if any significant building changes were indicated to have occurred a walk-through is conducted. There is sufficient documentation in the fire service literature and injury and fatality research that documents a reason to perform pre-incident planning and use that information in the execution of strategy and tactics. What is not identified is why so many company officers do not value the process or the product. This research project is focused on identifying the common factors that have resulted in the CCFES company officer to discount the PIP as a potent weapon in the fight against fires.
The Executive Fire Officer Program (EFOP) class *Executive Leadership* (EL) course objective is for the participant to develop the ability to use interpersonal skills and processes used by executive level managers (National Fire Academy, 2005, p. SM 1-3). This research will meet this objective through interaction with CCFES company officers to influence their attitude and behavior in the area of prevention and safety in relation to pre-incident planning activities. This will be accomplished by achieving two additional EL course objectives. The use of PIPs is intended to provide a first arriving unit and incident commander with vital information to make strategic and tactical decisions. The objective of using the Vroom and Yetton Contingency Model for determining the level of participation of the followers can be applied to the purpose of this research (National Fire Academy, 2005, p. SM 4-2). To understand the current perception and value placed on the PIP process, full participation and consideration must be made of the company officer’s input in this research. Additionally, this process can be translated to the fire ground and the collection and processing of information for operational decisions. A well prepared PIP provides the first arriving officer and incident commander with a tool that provides information that would otherwise not be readily available. In the Contingency Model this is the leader accepting input from the followers and then deciding alone, A2 (National Fire Academy, 2005, p. SM HO). The third objective is to describe the concept of influence and to discuss the tools and techniques of influence (National Fire Academy, 2005, p. SM 8-2).

This research supports four of the five mission goals of the United States Fire Administration as described in the self-study guide for Executive Development (R123). The results of this research will improve performance in the activity of pre-incident planning by identifying the weaknesses in the current approach and allow for revision and education targeted to correcting any identified deficiencies or misperceptions. This will a) reduce local risk through
prevention and mitigation; b) improve the products and use planning and preparedness activities such as Pre-incident planning; c) improve the response of personnel and resources through increased knowledge of the community and identified hazards; and d) increase the professionalism of CCFES and the fire service through positive interaction with the members of community.

Literature Review

Mike Chiaramonte (personal communication, October 14, 2008) delivered a special presentation to students and faculty at the National Fire Academy in Emmitsburg, Maryland on the results of the Phase II Firefighter Fatality Investigative Report on the nine firefighter fatalities experienced in June 2007 by the Charleston Fire Department. During this presentation the building and incident photos of the Charleston fire and many of the issues relating to PIPs and code enforcement at the company level were found to be similar to many of the non-residential structures found in Cobb County, Georgia; to the point that what happened in Charleston could easily happen in Cobb County. These striking similarities became the drive for this research project. The lack of code enforcement knowledge at the company officer level and the lack of attention to detail in pre-incident planning activities were the initial topics researched in the literature review.

Firefighter fatality investigative reports

The scope of this research was initially focused on a rhetorical question presented by Mike Chiaramonte that firefighters are taught hazardous materials awareness, but are not taught code enforcement awareness. He made a direct link between improving PIPs through an increased knowledge of fire prevention and code enforcement of line or suppression personnel. It was not intended in the presentation to mandate all fire officers be dual certified as fire officers
and fire inspectors. The intent was to indicate that a better informed officer can complete a better
developed PIP if they are aware of the direct correlation of occupant life safety hazards to
firefighter safety during fire ground operations.

*Firefighter Fatality Investigative Report Phase II (The Charleston Report).*

The Charleston report found that although a pre-incident (pre-fire) plan had been
completed the prior year for the location it lacked sufficient detail regarding the conditions and
layout of the building and the features that contributed to the fatal incident (Routley et al. 2008,
pp. 106, 143). Routley et al., also documented that the absence of code enforcement knowledge
at the company level contributed to the lack of hazard recognition during the preplanning
inspection. In 2001 a city ordinance was passed that discontinued annual fire code inspections.
City inspection records indicated that the Sofa Super Store was last inspected in 1998. The fire
inspection, although conducted by a fire official, was the responsibility of the City of Charleston
Building Department and routine communications of issues found were not communicated to fire
department line personnel (Routley et al., 2008, p. 37).

The observations regarding the actual pre-fire plan in the Charleston Report brought to
focus the similarities in the pre-incident planning process in Charleston and that in CCFES.
Routley et al. (2008, p. 107) first describe that the pre-fire plan of the building did not contain
sufficient detail. There were several features of this location that was lacking detail or not present
in the pre-fire plan including a) building construction; b) the complex nature of the site; and c)
the absence of any sprinkler system. Routley, et al. states that had the PIP contained sufficient
detail and been available to the incident commander the outcome would have been different.

NIOSH (2009, p. 47-48) in its firefighter fatality investigation report details similar deficiencies with the Sofa Super Store PIP; water supply and building construction. NIOSH (p.48) reports that,

A more thorough building inspection and PIP for this single-story commercial building could have potentially identified the flat roof supported by lightweight metal bar joists (metal roof trusses), the immense fuel load considerations (i.e. large quantity of furniture and associated highly flammable furnishings in the showroom as well as stored in various locations throughout the facility), the presence of a drop ceiling and hydrant locations.

The water supply that was most readily available to the location was on the C side of the complex, but was not utilized until mutual aid companies arrived (National Institute for Occupational Safety and Health, 2009, p. 48). The lack of recognition of this information by the first due officer and not available to the arriving incident commander set both individuals up to make decisions without good information.

NFPA 1620 Standard for Pre-Incident Planning

Review of the Charleston report and the associated NIOSH investigation report led to a review of the most recent edition of NFPA 1620 Standard for Pre-incident Planning. The NFPA defines the PIP as, “a document developed by gathering general and detailed data that is used by responding personnel in effectively managing emergencies for the protection of occupants, responding personnel, property, and the environment”. This standard approaches pre-planning from an all hazards approach and is not isolated to fire incidents. This standard holds that the authority having jurisdiction (AHJ) ultimately has the responsibility of defining the instrument as well as the process, but provides clear direction for this process to occur. The points from the
standard that are directly related to this research are cooperative development, site visit, and training. The NFPA (p. 1620-7, 2009) states that “the developers shall visit the property to become familiar with its layout, contents, construction, and protection features.” The standard indicates that the AHJ will develop a plan to determine the properties to be PIPned based on multiple factors. CCFES (2010, p. 36-37) has developed a risk assessment matrix and applied that process during the PIP process to assign a category to the 3200 buildings that are required to be pre-planned annually.

Currently, cooperative development occurs between the Fire Marshal’s Office (FMO) and the Response Division personnel through the FHRMS. PIPs are completed in the FHFRMS database and shared through that platform. The risk assessment is completed there as well. The public or private building owner interfaces with CCFES personnel through annual fire inspections and PIP site visits.

*CCFES Pre-Fire Plans (PIPs) Policy Section 6-22*

The next step in the literature review process was to look at any available internal documentation regarding pre-incident planning activities within CCFES. A review of the *CCFES Policy and Procedure Manual* reveals that there is only one policy relevant to this research, *Policy Section 6-22 Pre-fire Planning (Pre-incident planning).* This policy was adopted on November 4, 2008, and revised on November 2, 2009, it is available in Appendix A. The 2009 revision included the risk assessment form and scoring matrix for the *CCFES Standard of Cover* document for accreditation (CCFES, 2010, p. 38-39). The policy as it is currently written addresses a large portion of NFPA 1620; but the standard is not documented as related guidance in the development of the policy. The stated purpose of this policy is to make personnel aware of special hazards so that they can safely conduct operations with minimal risk to the public and
responders. It further clarifies this purpose to include a need to provide data and identify critical issues that may affect personnel safety and the outcome of the incident. It is meant to assist the Incident Commander to develop an appropriate incident action plan and strategies and tactics to manage the incident.

The policy addresses the following areas in pre-incident planning; a) specific types of structures to be pre-planned; b) frequency of pre-planning on identified structures; c) data collection to include process and elements; d) drawings of site and buildings; and e) process for reporting life safety violations. The frequency of the pre-planning process requires an annual update and walk-through of all pre-planned structures. This requirement further directs two other occasions when the PIP is to be conducted for a structure. A new building is to be pre-planned as the construction develops and through construction to occupancy. The third time a PIP is to be conducted is when significant changes have occurred and/or a new business has moved into the structure, the PIP is to be updated at the earliest possible time (CCFES, p. 2, 2008).

Fire Service Literature

The fire service training and educational literature covers the topic of pre-incident planning at multiple levels within the fire service. During this portion of the literature review terminology had to be considered in the research process. Pre is also described as pre-fire planning, pre-incident surveys, fire safety inspections, and company inspections. In order to assure that this research provides an apple to apples comparison, the definition and purpose as defined by NFPA 1620 was used to include the material as a part of this review. Within the literature it was found that the PIP is addressed from four basic perspectives; a) Firefighter II; b) Fire Officer; c) Strategy and tactics/operations; and d) Life Safety Code (LSC) enforcement.
The IAFC and NFPA (2009, p. 642) in *Fundamentals of Fire Fighter Skills* introduce the topic of pre-incident planning as “giving you the tools and knowledge you need to become a much more effective firefighter. Without a PIP you are going into an emergency situation ‘blind’.” Comparing the lack of a PIP to blindness is a strong and necessary image for the new firefighter. Murphy (2009, p. 885) continues with this use of mental imagery when he describes the PIP as greatly enhancing the ability of the firefighter to contend with a fire in a building. He goes on to further support the PIP at the firefighter level to describe it as providing the incident commander and officers “inside information” and the ability to anticipate problems and to better use resources. The International Fire Service Training Association (IFSTA) (2008, p. 970) writes a similar line in *Essentials of Fire Fighting and Fire Department Operations* adding the caveat that the PIP process allows the firefighter to gather this information under ideal conditions, when the building is not on fire. All three of these resources stress the importance of an accurate and detailed plan to provide the level of safety and operational readiness to fight fire in the non-residential structure.

*Fire Officer.*

The review of textbooks for the fire officer yielded similar results to the Firefighter II textbooks, that pre-incident planning is an important and vital job of the fire officer. Smoke (2010, p. 255) provides a quote from Francis L. Brannigan from the first edition of *Building Construction for the Fire Service;*

A building does not drop from the sky as does a disabled aircraft. Neither is it transient, such as a ship, truck or train. Very often it has been in existence since long before any of
the firefighters at the scene were born. Yet, sad to say, in many cases the building might as well be a space ship from Mars for all the fire department really knows about it.

This quote reinforces that there is no reason for a fire officer not to anticipate and be prepared for the non-residential structure fire and the demands it will place on the fire company and the department. In *Fire Officer: Principles and Practices* the IAFC and NFPA (2006, p. 214) reinforce that the proactive officer has a responsibility to the community and firefighters to reduce the risk of fire through hazard reduction by identifying and correcting hazards as well as reducing the impact if a fire occurs, they contend that this is effectively done through pre-incident planning. In this text they also explain that in the all hazards response environment that these PIPs may address other areas like hazardous materials, natural disasters, and terrorism. Stowell (2007, p. 379) sums up the PIP and its importance to the fire officer by explaining that the success or failure of incident operations often depends on the knowledge that operating personnel have in regards to the environment of the incident operations. He goes on to say that pre-incident planning is essential to that success.

*Strategy and tactics textbooks.*

The correlation between an effective size-up and the success of a fire ground operation is made routinely in the fire service journals and literature. One can hardly read a monthly journal without at least one article addressing size-up and command functions. The fire service literature has expanded in recent years through the influence of expanded degree programs in colleges across the country and the Fire and Emergency Services Higher Education (FESHE) program sponsored by the National Fire Academy (NFA). In the literature on strategy and tactics there is discussion at length on the importance of an initial size-up and continuing the size-up throughout the incident. The authors of these textbooks routinely stress that size-up begins with a well
prepared PIP. Mahoney, Rickman, and Wallace (2008, p. 139) describe the PIP process as the “pre-alarm size-up”. A time prior to an incident taking place that the firefighters and officers take time to determine the capabilities of the department based on the critical factors of the building. They stress that Pre-incident planning is extremely important to successful operations in complex structures or groups of structures and in buildings that are protected by fire protection systems (2008, p. 138). Klaene and Sanders (2008, p. 48) add a caveat that must be taken into consideration when developing the PIP; for it to be effective it must be useful in the field. If it is too simple or too complicated the end user will become frustrated and it will not be used. And finally, Smith (2008, p. 12) provides us with this, “Knowledge is a tool. The more tools we have at our disposal at an emergency scene the better the odds of a successful outcome.” Smith (2008) continues that the informed Incident Commander is able to make better decisions and to utilize resources more effectively if the knowledge and information needed are available. The PIP lays that information or knowledge foundation early in the incident if it is well prepared.  

Company level code enforcement.

IFSTA published a textbook in early 2010 titled, Fire Prevention Applications for the Company Officer. This textbook provides the fundamentals of fire code enforcement and includes an entire chapter dedicated to pre-incident planning. This is not the only textbook that dedicates a complete chapter to the subject, but it does so through an inspections and enforcement perspective at the company level. Lacey and Valentine (2010, p. 175-177) detail in their text the importance and process of a PIP. They reinforce all previous references in the fire service literature that have been discussed. The first point that they make has been the underlying theme in every area of the literature review; the amount of knowledge available before the incident has a direct impact on the success of crews operating at the incident. The time placed in
producing a well prepared PIP will increase life safety for the occupant and the firefighter according to Lacey and Valentine (2010).

Previous research.

A review of over 50 NFA EFOP applied research projects (APR) identified twelve ARPs that provided detail and direction in completing this research project. The ARP review for this project was broken down into two categories a) company inspections; and b) PIPs.

Company inspections

The ARPs that addressed company code enforcement inspections provided a perspective that similarly affects successful pre-planning efforts. The PIP ARPs reviewed were selected due to their relevancy to this project in information that was or was not addressed. Five of the reviewed ARPs addressed establishing or evaluating the performance of a company level code enforcement inspection. The company inspection and the company pre-incident planning site visit share several common factors or considerations and made review of these ARPs relevant to this research project. The company level inspection presents benefits and challenges as does the company PIP.

The primary responsibility of the fire company is to respond to request for emergency assistance in the communities represented by the various authors and CCFES. Due to the similarities of the two inspections and references within the included ARPs to pre-incident planning inspections in conjunction with a company level inspection, the information was found to be relevant to this research project. The challenges presented by the company level inspection found in the reviewed ARPs were a) available time; b) training requirements; and c) cultural change.
**Time.**

Time is a diminishing resource for most company officers in today’s do more with less government and business model. Adding tasks and responsibilities must take this into consideration. Sinsigalli (2007, p. 21) cautions that in implementing a program of this type one must consider the sum of all the duties and the multiple responsibilities that must be addressed by the company officer. Caussin, Jr. (2009, p. 19) relates that the company level inspection had all but vanished from Fairfax Fire and Rescue due to increasing call volumes when EMS response was added and companies complained that the firefighters simply did not have time to adequately complete the assigned inspections. O’Leary (2007, p. 14) provides the details of these additional duties and responsibilities to include a) call response; b) training; and c) routine maintenance duties.

**Training.**

Training requirements, in relation to a company level code inspection, center around the authority to conduct an inspection and issue citations in the event deficiencies and violations are identified during the inspection. Training is a need for both the company inspection and the PIP site visit as both expose the fire company to the public directly. Jee (1999, p. 28) states that the company inspection benefits the department by increasing the public image of the firefighter through increased knowledge and skills by being more familiar with the community served. The training of the officers and firefighters is critical to deliver a successful company inspection (O’Leary, 2007; Royse, 2007). O’Leary (2007) states it very strongly, “Training is the backbone of a successful program.”
Cultural change.

For each of these projects researching company level inspections, the culture of the organization presented a primary challenge. It was agreed by all authors that the commitment had to start at the top of the organization and filter down through the ranks (Caussin, 2009; Jee, 1999; O’Leary, 2007; Royse, 2007; Sinsigalli, 2007). Caussin (p. 24) relates that fire prevention had not become a part of the overall department culture and that code inspections had become almost exclusively the role of a fire inspector when EMS and other special responses were added to the company level responsibilities. With the loss of the company inspection, the PIP process had all but vanished as well. Royse (p. 23) indicates that the importance of any inspection program requires that it be a part of the mission statement of the organization. The bottom line message is the organization must do more than simply issue a policy or directive mandating the inspection. The inspection process must be a part of a safety and prevention culture.

PIPs

There were many ARPs that address the need to improve pre-incident planning. There were three themes found a) the elements of a PIP; b) the medium with which the PIP is recorded; and c) how responding companies access and use the PIP. The shared challenges of completing fire inspections and pre-incident planning visits became very clear in this portion of the literature review. Underlying issues that were identified in the review but were not addressed by the authors of these documents were a) training; b) culture change; and c) procedural execution.

Training.

Many of the programs that were reviewed in various ARPs documented a need to institute a training program for company officers and firefighters. Many of the open ended responses from the survey participants demonstrated a level of frustration with the lack of training. King
(2009, p. 32) reported in an interview that a firefighter stated “(We) are not sure of what we are looking for and if we notice and report something, it is unchanged when we return later”. This is a demonstration of a lack of understanding at the operational level of the department. King also conducted a national survey that found many department representatives that participated in the survey reported that they did not know why they pre-planned specific buildings. These examples indicate personnel that demonstrate compliance to a policy or procedure; but lack an understanding of why there is a policy or procedure. Fox (2008, p. 29) reports that company members stated that they did not receive training in the pre-incident planning process and were unsure of the key areas to be evaluated and documented. Not only is a lack of training apparent in the development of the PIP, but Roy (2010, p. 46) states that end users of their PIP reported they did not realize any benefit of the process; this points to a lack of training in the use of the finished product. Training is an issue in the development and use of a PIP program in many departments.

*Culture change.*

Just as organizational culture was found as an issue, regarding company inspections, in the literature, so it was with the PIP process. Essentially all agreed that the PIP is an important process and that the accurate completion and a usable document are critical to fire ground operational success (Altman, 2009; King, 2009; Major, 2008; Price, 2008; Roy, 2010; Vaughn, 2010). The fire service literature and all reviewed research papers agree to this fact, yet well over 15 ARPs since 1989 have sought out the answer as to why the PIP is deficient in that organization and how it can be improved. Roy (2010, p. 57-58) states that the process must have a commitment from every member of the organization, starting at the top. Roy (2010) continues that once the employees are engaged in the process, changes to a program can be made to refine
the details. Employees that are engaged have bought into the program. Comments received by King (2009, p. 29-30) support that buy-in at all levels is critical to a successful program. Two respondents to King’s survey instrument reinforce this need stating, “The officer must sell the value of PIPs” and “never saw a complete PIP or the benefits of all the work doing one.” Altman (2009, p. 31) sums up the issue of culture change in his recommendations indicating that increasing the use of PIPs by firefighters requires creating a vision, timeline, and strategy for implementation. Culture change is a slow and often difficult process, firefighters and fire officers are known to be stubborn and to resist change.

Summary

The literature review for this research encompassed current literature and research regarding pre-incident planning. Similarities in the literature of fire inspections and pre-incident planning provided an alternate perspective regarding the practice of inspections or surveys for life safety purposes. It should be noted that the difference between the fire inspection and PIP is the intention; code enforcement or location familiarization and planning. Both types of inspections result in increased safety for the occupant and the firefighter. In the review of literature it is noted that the focus of research in the past has analyzed the elements, the process, and the effectiveness of the PIP. At the beginning of this review it was the focus of the research to identify how an awareness level of LSC knowledge could improve the PIP process. After review of the fire service literature and gathered ARPs, it is obvious that pre-incident planning is identified as a critical factor in emergency operations success. The issue that is clearly identified is that the process does not produce a product that benefits the end user when it is most needed.

All reviewed documents address the PIP and the process as the issue that needs to be adjusted. There are standards and policies in place that define a well prepared PIP. The
instrument appears to be well defined and many processes are available to emulate or adopt by an organization. This author saw that the issue written “in between the lines” of every ARP reviewed was the acceptance of the PIP as a part of the end user’s approach to incident management and safety. The focus of this project changed from identifying the knowledge and skill level of the company officer in fire and life safety code in relation to pre-incident planning to why the PIP is not valued and used routinely in emergency response. This focus shifted the remainder of the project to focus internally on CCFES company officers to determine their valuation of the PIP process and use within CCFES. The literature review revealed that another research project on the elements or process was unlikely to reveal any new perspective or new information for the good of CCFES or the fire service. The goal of this research is to describe an internal perspective that can be applied to future research projects with a similar introspective focus.

Procedures

The purpose of this research is to identify why CCFES company officers do not fully value the pre-incident planning process and incorporate it into the training and operational activities at the company level. After the literature review it was determined that conducting an interview with a sample of company officers and their crews and distributing a web-based survey directly to CCFES company officers would provide the information and data necessary to achieve the purpose of this research.

An interview was conducted with CCFES Fire Marshal Jay Westbrook to determine how recognition of code violations could be addressed by non-certified inspectors to proactively address occupant and firefighter safety during pre-incident planning activities. The FMO
maintains the database that the PIPs are stored in and works integrally with company officers on PIPs.

During the literature review it was identified that the current CCFES Policy Section 6-22 Pre-Fire Plan (PIP) and the procedures outlined within that policy satisfactorily met the identified elements contained in NFPA 1620 and as described in the fire service literature. The task was to identify the level of compliance to the policy and if any deficiencies were present and to identify the contributing factors.

Interviews

Crew interviews were conducted in January and February of 2009 with four double companies and one triple company. These crews were selected due to the structural demographics of the station territories to include non-residential buildings. All companies assigned to a station with a truck has an officer assignment of a lieutenant and a captain. This allowed the interview to include two officers and their crews. Station 2 is assigned one lieutenant and was the only double company with one officer for the crew. Table 4 details the units assigned to each crew interviewed.

Table 4

**Fire Companies Interviewed**

<table>
<thead>
<tr>
<th>Station</th>
<th>Shift</th>
<th>Battalion</th>
<th>Unit types assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>1</td>
<td>Engine, Truck, Rescue</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>2</td>
<td>Engine, Rescue</td>
</tr>
<tr>
<td>19</td>
<td>B</td>
<td>2</td>
<td>Engine, Truck</td>
</tr>
<tr>
<td>19</td>
<td>C</td>
<td>2</td>
<td>Engine, Truck</td>
</tr>
<tr>
<td>21</td>
<td>A</td>
<td>3</td>
<td>Engine, Truck</td>
</tr>
</tbody>
</table>
The questions were intended to be general so as to allow the interview participants to expand on each question this allowed for the concerns of participating personnel to be expressed in regards to the development and use of PIPs within CCFES. Three questions were asked of each group;

a) What are the benefits or disadvantages of pre-fire plans as conducted by CCFES?

b) What do you look for during a PIP site visit?

c) Do you address any life safety or code enforcement issues when completing the PIP walk-through?

These initial interviews allowed the author to gain information from a sample of department personnel to aid in the development of the specific items for the company officer survey.

CCFES Fire Marshal Jay Westbrook was interviewed in January of 2009. The Fire Marshal’s Office is responsible for maintaining the occupancy information and inspection records in the CCFES FHFRMS. This module of the FHFRMS loads the information for the PIP module utilized by field personnel. The initial direction of the research was to identify whether knowledge of the LSC is addressed during the Pre-incident planning site visit for occupant and firefighter safety. The research was redirected due to information found during the literature review to focus on the perceived lack of value and under utilization of the PIPs by the company officer. The questions and interview notes used in the interview of the Fire Marshal are included in Appendix B.

Company Officer Survey

The literature review and crew interviews provided the basis for the focus of this research project and the questions that are included in the Company Officer Survey instrument. This
survey instrument was designed, delivered, and analyzed through an internet based service, Survey Monkey®. The survey was conducted for seven calendar days in June 2011, ending on July 1, 2011. The email invitation for participation is included in Appendix C. Several questions within the survey were built with skip logic. Skip logic directs the participant to specific areas of the survey based on how they answer a particular question. This prevents participants from having questions presented that are irrelevant based on previous responses. As an example question 6 inquires if they have a college degree. If the participant answers ‘no’ then they do not need to answer the question regarding the level of their degree. The survey questions and summary results are located in Appendix D. The survey was divided into seven pages or sections; a) demographics; b) PIP training; c) PIP completion; d) PIP process; e) PIP strengths and weaknesses; e) PIP walk-through; and f) code enforcement actions.

Participant demographics.

The survey participants were selected based on their assignment as a CCFES company officer. There are 24 captains and 86 lieutenants assigned to the Response Division of CCFES. There are 4 lieutenants assigned to the Training Division that were solicited for participation in the survey due to the rotation frequency of the training officer assignment. Training officers voluntarily serve a two year rotation with the Training Division. It is because of this short assignment that participation was included. The company officer group was the total population that was solicited to participate in this survey. Participation was requested but not mandatory for any officer. Because of the small size of the population, the total population was solicited for participation. The total population of the identified group was 114. Of the 114 potential participants, 82 personnel participated. The survey was not conducted to achieve a statistical
sample, but to collect a sufficient amount of information that allowed a description of the current attitude and approach to pre-incident planning within CCFES.

The purpose of the demographic section of the survey was to establish the background and relevant details of the survey population. The questions in this section were used to describe the rank, time in rank, time in CCFES, and time in the fire service of the participants. Understanding the experience level provided insight to the collected data. Questions related to the fire service certifications and education level of the participants was asked in this section as well. Fire service certification in the State of Georgia is administered by GFSTC through ProBoard National Professional Qualifications (NPQ) testing. The certification and education levels have a direct connection to the training section of the survey instrument. These questions were included in the demographic section as a tool to describe the participant and used to compare to the training section questions.

Training.

The use of skip logic was used in more questions in the training section of the survey than any other section. The purpose of this section of the survey was to identify several components of training in Pre-incident planning the participants had received. The first question was to determine if the participant had received formal or on-the-job training (OJT). Participants were then presented questions specific to the response they entered.

Participants that indicated they had received formal training answered six questions. The questions addressed these areas of the training a) the source; b) the recency; c) the method; d) the type; e) the length; and f) any OJT. The goal of this set of questions was to determine if there has been a consistent training method of department company officers for Pre-incident planning. Through the participants response, the strengths and weaknesses of the training can be evaluated.
and addressed as is appropriate. The final question of this section identified if the participant received OJT in addition to any formal training. Those that indicated they did not receive any OJT were taken to the pre-incident completion page. Those that indicated they had received OJT were taken to the OJT training page of the survey.

Participants answered four questions related to their experience with PIP OJT. The questions addressed the following areas of the OJT a) the recency; b) before or after promotion; c) the method; and d) feedback mechanism. OJT as a training method is a valuable and often used tool in the fire service. This set of questions was used to determine if it has been the ‘formal’ method of training for the Pre-incident planning process in CCFES.

*Pre-plan completion.*

The next section of the survey sought to identify the attitude toward the completion of the PIP as perceived by the participant. This section included three questions. The first question was a multi-select question regarding the reason PIPs are completed by CCFES personnel. Several of the answers provided were distracters. Those answers sound valid, but are incorrect in nature. As an example one of the choices was ‘required by NFPA standards’. Although the NFPA standards may use language to require a task or process, unless it is officially adopted by the AHJ it is not a requirement at that level. In other words, NFPA alone does not have the authority to require a jurisdiction to do anything. The remaining two questions asked the participant what was the primary reason for completing the PIP from their perspective and then the perspective of the department. Essentially these questions asked the participant to define why CCFES personnel do PIPs.
The method.

The next section of the survey gained information on what methods the participant utilized to complete the PIP process. The participant was asked the following questions: a) what elements of the PIP are completed on every plan annually; b) what frequency should various elements of PIPs be completed; c) rank in order of importance the elements of the PIP, and d) how often the participant uses various methods to complete the PIP.

Strengths and weaknesses.

The next section of the survey contained only two questions, each one was a two-part question. The first question provided a list of elements or attributes of a PIP and asked the participant to check the item if it was a strength during planning or response. The question allowed multi-answer selection for each item. In other words, the item could be checked indicating it as a strength for planning, response, both, or neither. The second question repeated the process and was to identify which items were considered weaknesses. The item list was broke into two category areas; pre-plan information and the pre-plan drawing. Concerns such as detail, location, accuracy, and relevancy were included in the list.

The final three questions addressed the walk-through and LSC enforcement. One question was dedicated to the PIP walk-through. This question allowed the participant to identify and select multiple items they considered critical elements to observe or address during a walk-through. The remaining two questions inquired if the participant identified and addressed LSC violations during Pre-incident planning. The final question was to solicit the opinion of the participant on whether the company officer should address LSC violations during the PIP visit and to justify their answer.
Limitations

Several limitations were observed while conducting this research and should be considered individuals who seek to further this particular topic and improve the development and use of PIPs in their organizations and the fire service.

This project found that even after a review of the survey instrument by a sample group there were participants that found a few of the questions confusing. When the questions were developed and reviewed they appeared to achieve the desired results, but several participants provided feedback in regards to a few questions. It is accepted after delivery of multiple survey instruments in research that the best planned question may still be misinterpreted by the participant. In addition to confusion or misinterpretation of questions, the use of skip logic can be challenging. Use caution and verify the flow of the survey multiple times to prevent the need to clean the data after the survey closes. The automated features of the service make building and publishing the survey very easy and accessible, but the advanced features such as skip logic are not easily tracked through the survey instrument. As with any survey, another limitation is the potential misinterpretation of the question content by the participant. There is no magic bullet or perfect solution to this breakdown in the communication feedback loop without potentially contaminating the answers of the participants with researcher bias.

The group interviews, although productive, are time consuming. The free style answer format that this author used to conduct interviews often had participants go ‘off script’ and they had to be corralled back to topic. The group interviews were very beneficial in the design of the Company Officer Survey instrument, but were very time consuming. The other caution in the group interview is the possibility of researcher bias in the questions. It is possible to lead the participants towards a desired end and caution must be exercised to avoid interviewer bias. It was
found that an open-ended question and often a silent pause allowed enough time for the group to begin a discussion and for the interviewer to engage in listening and documenting the dialogue that occurred.

Definition of Terms

Company Officer – This is the first line supervisor or beginning middle manager in CCFES; a lieutenant of captain.

Company – a company is the personnel assigned to a specific apparatus. This typically includes four personnel; one company officer, one Fire Engineer, and two firefighters. A double company is two apparatus. A triple company has three apparatus.

Non-residential building – for the purpose of this research this includes commercial, industrial, and public structures

Pre-incident plan – a process when firefighters assess a building for hazards to the occupant and the fire service before an incident occurs. Also know as a pre-fire plan; pre-incident survey.

Fire inspection – an inspection performed by an inspector. The inspection is made to assure that the building and process are in compliance with local and State laws and rules and regulations.

Results

The presentation of the Sofa Super Store fatality fire and the personal experiences of the author called to attention the lack of importance that the Pre-incident planning process was viewed with by CCFES personnel. The assignment to a double company in 2001, upon the promotion of the author to lieutenant, was the first exposure to the deficiencies of the PIPs and the process within the department. After a review of all of the assigned PIPs, it was discovered
that some had only been telephone updated annually and the last visit occurred in 1994 by an officer who was a lieutenant at the time and was now a battalion chief. The purpose of the crew interviews and the *Company Officer Survey* was to discover why this lack of value was occurring and identifying possible solutions.

This is a summary of the three open-ended questions posed to the multi-companies in the crew interviews. These discussions revealed sentiments and opinions that cannot be adequately measured in a survey instrument. The inclusion of engineers and firefighters in these discussions exposed the interviewer to their experience and knowledge on the purpose and value of the PIP process.

*Crew interviews*

The general consensus in every crew interviewed in regard to the benefits or disadvantages to PIPs was the process is busy work and does not provide a strong benefit to the fire company. One officer (personal communication, January 17, 2009) indicated that, “The PIP is nothing more than a map and feature locator”. A firefighter (personal communication, January 15, 2009) echoed the sentiment of participants in every interview that, “The plan is nothing more than busy work to comply with ISO”. This observation was also coupled with the statement by several participants (personal communication, January 2009) that, “it is nothing more than a contact sheet to get someone to secure the property before we can leave”. Several officers indicated that as a planning tool the PIP lacked critical information needed for true pre-planning and preparation. Items they included were hydrant flow rates and the fire suppression system flows and capabilities. These factors influence needed fire flows and line deployment of initial arriving companies in many cases. One captain noted (personal communication, January 17, 2009) that “each of the three shifts are assigned a pre-plan territory and they never see the
buildings pre-planned by the other two shifts unless they are responding to a call at that location”. The captain continued, “if it is a target hazard that should be pre-planned then every crew should conduct a site visit and review the plan while there.”

Although all participants admitted to having been trained in recruit training and/or company officer school that the PIP is important for safe and successful operations, the general complaint was they do not have the time or adequate training to recognize what needs to be documented and addressed. Several officers and their personnel commented that a basic class should be provided to all personnel in conducting the PIP and what is expected (personal communication, January 2009). Several personnel pointed out that they were aware of basic details that should be included in the PIP, but could not explain why it is included or why it is important. One captain (personal communication, January 2009) suggested that “the department and the Fire Marshal’s Office regularly provide personnel with a list of items to look for and ‘stories from the field’ that highlight issues and solutions found during Pre-incident planning activities”.

The issue of violations of the LSC and enforcement issues was presented as a question and received the most discussion in the crew interviews. The primary concern expressed by personnel was the lack of training and authority. All crews expressed that they looked for blocked and locked exits, an obvious safety concern. None of the crews were comfortable with a fire inspection level of activity or addressing the occupant at the fire company level. One lieutenant (personal communication, January 19, 2009) commented that, “the community likes the fire department and doing inspectors work would damage that relationship”. This sentiment was echoed by several of the firefighters and other officers as well, most indicating that all personnel would require training on how to approach a perceived violation and presenting the
solution to the owner/occupant. The discussion that followed the recognition of violations was the process of reporting and resolution of violations to the FMO. The officers participating in the crew interviews were particularly concerned with this part of the process. Almost every officer interviewed had reported a blocked egress or “something that did not look right” to the FMO. The complaint from each of those officers was that the FMO did respond quickly to their report, but they were never informed of the outcome or even if there was a violation (personal communication, January/February, 2009).

**Company Officer Survey Results**

Determining why an officer perceives pre-incident planning should be completed was answered in a series of three questions. The top three reasons as identified by survey participants were a) firefighter safety; b) required by departmental policy; and c) occupant safety. Figure 1 provides the breakdown of responses that were available for selection by the participants.

![Graph showing reasons for pre-incident planning](image)

**Figure 1** Identify the reasons PIPs are completed by CCFES personnel

Two follow-up questions were used to determine how the participant perceives why pre-incident planning is completed. The two follow-up questions addressed the primary reason as
perceived first by the participant and then by the department. Table 5 demonstrates the contrast between the perception of the officer and their perception of the department’s reason for pre-incident planning. There was one response to the other category in the department question. The response was, “I have no idea why”.

Table 5

**Pre-incident planning primary reason comparison**

<table>
<thead>
<tr>
<th>Policy</th>
<th>ISO Safety</th>
<th>NFPA Safety</th>
<th>Occupant Safety</th>
<th>Firefighter Safety</th>
<th>Other Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officer Dept</td>
<td>14.8%</td>
<td>25.9%</td>
<td>1.2%</td>
<td>8.6%</td>
<td>-</td>
</tr>
</tbody>
</table>

Contrasting the top three reasons in Figure 1 and the data on occupant safety in Table 5 provides a possible contradiction in the surveyed population. While occupant safety was the number three reason for pre-incident planning overall, it gained only 1.2% as a primary reason from the perspective of the participant and 2.5% from the perspective of the department. Firefighter safety was the overwhelming reason for conducting the PIP process.

Constructing a question that would measure the perceived strengths and weaknesses of the PIP from the perspective of the company officer was a more challenging task than it was originally thought to be during the design phase of the survey. A total of eight participants entered that they were unclear of the questions purpose in the other field. Table 6 and Table 7 provide a breakdown of the responses to these two questions on the survey. The assumptions that can be garnered from the data suggest that the information is a benefit during the planning process more than benefits are found during the response. Conversely there is a higher confidence demonstrated in the drawing during the response than during the planning phase. A
disturbing trend in the strengths and weaknesses of the PIP during response is that all ten categories scored above the 60th percentile as a weakness. Those same ten categories only score above the 70th percentile in three categories as being a strength. In seven of the ten categories the PIP during response is scored higher as a weakness. This may indicate that there is a lack of confidence in the current PIP process.

Table 6

<table>
<thead>
<tr>
<th>Detail</th>
<th>Location</th>
<th>Access</th>
<th>Accuracy</th>
<th>Relevancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info</td>
<td>Draw</td>
<td>Info</td>
<td>Draw</td>
<td>Info</td>
</tr>
<tr>
<td>Strength</td>
<td>84.4%</td>
<td>70.3%</td>
<td>67.7%</td>
<td>55.0%</td>
</tr>
<tr>
<td>Weakness</td>
<td>57.1%</td>
<td>58.5%</td>
<td>42.0%</td>
<td>56.3%</td>
</tr>
</tbody>
</table>

Table 7

<table>
<thead>
<tr>
<th>Detail</th>
<th>Location</th>
<th>Access</th>
<th>Accuracy</th>
<th>Relevancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info</td>
<td>Draw</td>
<td>Info</td>
<td>Draw</td>
<td>Info</td>
</tr>
<tr>
<td>Strength</td>
<td>45.3%</td>
<td>64.1%</td>
<td>66.1%</td>
<td>73.3%</td>
</tr>
<tr>
<td>Weakness</td>
<td>67.9%</td>
<td>67.9%</td>
<td>72.0%</td>
<td>60.4%</td>
</tr>
</tbody>
</table>

Training and education

The training and education portion of the survey encompassed 16 of the 32 questions delivered. This accounts for half of the survey. Many of these questions were intended to cross reference and verify some of the data being collected as well as to fully describe the population surveyed. The participants were asked to identify any ProBoard or NPQ certifications that they
have obtained that could be relevant to pre-incident planning. 81 of the 82 participants answered this question. All participants indicated they held a certification as a Firefighter II or a Fire Officer I. These certifications both require training to include the development and use of PIPs. Interestingly several indicated they held certification as a Fire Officer I or higher but did not hold Firefighter I or II certification. In order to obtain ProBoard certification at the Fire Officer I level the individual must possess Firefighter I or II depending on the edition of the standard. This survey did not attempt to identify what edition of certification the participant held. For the participants that indicated they had a college degree thirty three of those participants were awarded degrees in a public safety or fire service program. This number is closely related to the number that indicated that they received formal training in Pre-incident planning. Thirty participants indicated they had received formal training.

*Formal training.*

The participants that indicated that they had received formal training were asked to identify the source of that training. This question allowed the participant to select any response that applied. The top three sources of formal training in from highest to lowest was; a) CCFES, b) college; and c) self-study. The participants who indicated they received formal training represent only 37% of the total population surveyed. Figure 2 displays the breakdown of the responses to this question.
Figure 2 Source of pre-incident planning training.

Note: the y-axis is the number of respondents.

The recency of training directly impacts the retention and use of the material learned. The participant was asked how long since they had received PIP training. Over 50% of the participants indicated it had been less than two years. Surprisingly over 30% indicated that it was over five years since they had received any PIP training. All but two of the twenty eight participants in the formal training group indicated they received OJT as well.

The participants that indicated that they did not receive formal training on PIPs were asked if they received OJT. This group overwhelmingly, 69.4%, indicated that they had not received any PIP training in the last five years.

The length of the formal training ranged from one hour to multiple days. One participant indicated they attended a seven day course. Based on the source of the training the responses indicate that the material is delivered as a component of a larger class and as a standalone class.
Figure 3 Recency of formal training

Note: the y-axis is the number of respondents.

Figure 4 Recency of on-the-job training

Note: the y-axis is the number of respondents.

On-the-Job Training

Of the eighty one participants seventy seven reported that they had received OJT for pre-incident planning. The OJT was received prior to being promoted for 75% of the participants that
answered that question. The average year in rank for the survey population is six years and this correlates with the data indicating that the OJT occurred over five years ago as indicated in Figure 4. The source of the OJT was inquired of all participants that indicated OJT. Four sources were provided with a response of other that required a typed answer. Three participants answered other out of the total of eighty. Forty six or 59.7% of the participants indicated they received their training from the example of a previous officer. The scope of this research was not to identify the mentor or specific officer. Figure 5 displays the OJT sources.

![Figure 5 On-the-Job Training source](image)

Note: the y-axis is the number of respondents.

The final question in the training section and sub category of OJT asked the participant if after receiving their OJT if they had received any feedback. Almost 80% of the participants that received OJT indicated that they did not receive any feedback.

**Common practices**

Identification of the common practices and comparing those practices with the current *CCFES Pre-Fire Plan Policy* was achieved through question 25 on the survey. This question
asked the participant to identify from a list of activities those which are completed every year. The current CCFES policy indicates pre-plan activities will be conducted on all identified target hazards annually. Figure 6 provides the participants responses to this question.

Figure 6 Elements of a PIP performed annually

Note: the x-axis is the number of respondents.

The participants were asked to identify what they perceived to be an adequate frequency of conducting the PIP activities from the previous question. Completing PIP activities on an annual basis was the majority consensus for all rated tasks. Update/complete a building/floor plan drawing and notify the FMO of LSC violations tied for the lowest rating at the 50th percentile for the annual category. Including the two change categories for these two tasks increases both to ratings over the 90th percentile. In general, all participants support annual pre-planning with additional activities if changes to the building occur. One task category deserves specific mention; notification of other shift company officers. This task was rated at 46.2% for
annual notification of changes and issues to the building. The major changes category only received five responses or 6.4% of the participants indicating this as a frequency. This may be a misunderstanding of the question or an indication that there is a barrier to inter-shift communications. The result of this rating comparison is demonstrated in the stacked bar graph, Figure 7.

![Figure 7 PIP task completion frequency](image)

*Figure 7 PIP task completion frequency*

Note: the *x-axis* is the number of respondents.

Utilizing the same categories from the previous question the participants were asked to rate each task by level of importance from 1 to 8. One was considered to be of the highest importance and 8 the lowest importance. For the purpose of this survey the rank order was achieved by calculating the rating average of each task. The results identified the top three tasks in descending order of importance a) correct immediate threat LSC violations; b) complete a building walk-through; and c) identify LSC violations. The bottom three tasks in descending
order of importance were; a) notify the FMO of LSC violations; b) update/complete a site plan drawing; and c) update/complete a building/floor plan drawing.

The final question used to evaluate the common practices of completing the PIP required the participant to indicate what percentage of the time specific methods were used to complete or update a PIP. Note that one of the methods listed was a location drive by. This was intended to be what it describes, driving by a location without stopping, much like using the drive thru at a fast food restaurant. This item received responses as high as the 100% of the time response; 8 participants indicated they use this method. This may be a misinterpretation of what the question intended. This response choice should be defined if used in future survey instruments to remove any ambiguity or misinterpretation.

![Figure 8 Percentage of time method used to complete PIP](image)

*Note: the x-axis is the number of respondents.*

**Critical items and the LSC**

The final three questions of the survey required the participant to identify, from their perspective, critical items to be observed and addressed during a PIP walk through. From the list
of items contained in *NFPA 1620, Standard for Pre-incident planning (2010 Edition)* and the *CCFES Policy and Procedure Manual Section 6-22 Pre-Fire Plans (PIPs)* an abbreviated list of eighteen items were selected. Six of the eighteen items were rated above 90% as critical items to be considered with the top three identified as a) fire department connections (FDC); b) hazardous materials; and c) construction type. The response percentage for both FDCs and hazardous materials was 97.3%, a tie for the top position on the list. The entire list of the items participants selected is displayed in Figure 9.

![Figure 9 Critical items during walk-through](image)

The final two questions addressed the actions of the company officer in relation to LSC violations encountered during the PIP walk-through. The first question asked was if the participant routinely address LSC violations while conducting the PIP walk-through. Figure 10 displays that over half of the participants do not routinely identify and address LSC violations.
The follow-up and last question of the survey asked the participant if the company officer should address life safety code violations during the Pre-incident planning process. Figure 11 demonstrates that over three quarters of the participants, CCFES Company Officers, should address LSC violations during the process.

Figure 10 Are LSC violations routinely identified and addressed during the walk-through

The survey consisted of thirty two questions, twelve that provided the participant the opportunity to type in a free text response. These twelve questions resulted in 168 free text comments from the participants. In general the majority of the responses support and believe pre-incident planning is a valuable tool, but express a deep frustration with the lack of support, education, and commitment to getting them done correctly. The review of the free responses allowed for a better understanding of the data collected in the survey. The comments received from these free response fields can be found in Appendix E. The comments are under the related question and listed in the order they were received.
The importance of a well prepared PIP for an emergency operation is well documented in literature and research. The literature expounds the virtues and value of knowing the battlefield and understanding the enemy before the first resource is ever committed to the fight. Many researchers have pondered on how to a) improve the elements of the PIP; b) evaluate the medium the PIP is stored on; and c) improve accessibility of the PIP during response. The one aspect of the PIP process that has not been recognized is the value to the end user. Changing the format or elements of the document or the medium it is delivered to or on will not matter if the end user does not believe it will make a difference or provide a benefit.

One CCFES company officer wrote that, “Our prefire [sic] plans at our station are of bad quality. Officers are just checking things off so not to get on a bad list”. Another CCFES company officer commented, “I hear way too many stories of how pre plans are completed with phone calls only” (Appendix E). The frustration is not isolated to CCFES, Roy (2010, p. 49-50) reports that accessibility, consistency, and a lack of current information is why the PIP fell into
disuse in the San Gabriel Fire Department. Finally, King (2009, p. 30) reported that an officer stated they had never seen a complete PIP or any benefit from the work their company put into doing their PIPs. For an officer to spend the time and resources to produce a well prepared PIP they must be provided with a good reason that they can buy into.

The frustration of the company officer is complicated by having to manage and prioritize multiple critical assignments and assure a quality product as well. “Our department worries too much about making so many ISO hours that other things are suffering and one of the items suffering is prefire plans”, commented a company officer. Finding a way to make pre-incident planning fit into the mandatory ISO training hours and produce a quality PIP is a solution that could provide relief to the company officer. It would not only provide relief, but would improve the quality of the PIP.

Eight out of ten of the surveyed CCFES company officers report that firefighter safety is the primary reason they complete pre-incident planning. When asked what the primary reason the department requires pre-incident planning only six out of ten believe it is firefighter safety, a 20% difference. It is not a surprise that firefighter safety was the top choice. All survey participants indicate they have Firefighter II or Fire Officer I ProBoard certification. Job performance requirements for those certification levels require successful training on completing and coordinating pre-incident planning, as well as a focus on firefighter safety. The fact that company officers are not convinced that the department rates firefighter safety as highly as the officers is a concern and may contribute to the resistance to department mandated programs, like pre-incident planning.

When allowed to select multiple reasons for completing a PIP, the top three choices included a) firefighter safety; b) departmental policy; and c) occupant safety. Occupant safety
was selected by 52 of 81 participants or 64.2%. But when only allowed to select a primary reason it falls to a total of three out of 162 responses. It is obvious that the CCFES company officer directly connects pre-incident planning and firefighter safety, but does not appear to make a connection with occupant safety and fire prevention. Providing the officers with examples of how unrecognized or unaddressed LSC violations and occupant safety issues have and will impact firefighter safety may be a significant step in confirming the value of pre-incident planning.

During the crew interviews the statement that the PIP is nothing more than a map and feature locator is well expressed in the PIP strength and weakness questions. A review of Table 6 and Table 7 provide a contrast of the strengths and weaknesses of the PIP during the planning and response phases of pre-incident planning. By the numbers, the drawing of the PIP rated the strongest during response. The highest score for the response phase was the rating for the drawing accessibility item; 74.6%, or 44 out of 59 respondents. The information section of the PIP was rated as a strength during the planning phase of pre-planning activities. The highest score for the planning phase was the rating for the information detail item; 84.4% or 54 out of 64 respondents. Five of the seventy four participants commented on the Question 29 that they did not understand the question. Three of the seventy four participants made the same comment for Question 28. Overall, none of the ten rated items performed strongly on average. The PIP rated at its overall best rating scored in the 70% range. This is not a strong level of confidence in the document for tactical advantage to be gained by the company officer. It appears that the expectations that are taught in the various programs are not realized and the PIP has become one more required activity with no personal or internal motivating purpose. At issue is the perceived benefit of the work put into the plan. Firefighters and fire officers understand why they complete
and what they collect for a PIP (King, 2009, p. 33). What they often do not understand or see is the benefits of the process and the use of the end product for their efforts. The progressive officer looks outside the box and finds uses as one officer commented that they use their plans for strategy and tactics training in station. Jee (1999, pp. 27-28, 34) reinforces selling the benefits of the walk-through when speaking of company fire inspections; benefits such as operating valves of protection systems and becoming familiar with the building layout.

Two areas that share the same deficiencies are training and common practices. Several previous ARPs reported the deficiency in training and common practice as a challenge to the PIP program in their respective departments. All cited interviews and data provided by participants that complained of a) a lack of basic training; b) consistency of documentation, and c) no defined process (King, 2009; Roy, 2010; Vaughn, 2009). CCFES officers provided similar comments in the survey. But the data clearly suggests there has been no centralized training program provided. When asked where they received their PIP training it was divided evenly between the department and a college program. The comments of the participants indicate there is a need for common training in the department. Without a central message endorsed by the department the habits that have been passed down over the years will continue.

Although CCFES Policy 6-22 Pre-Fire Plans (PIPs) requires all identified target hazards to be pre-planned annually with a walk-through, the survey reveals that this is not the case. Only 57 of 78 CCFES company officers responded that they conducted an annual walk-through, as required, on every PIP. Reasons abound within CCFES as well as other fire departments for not adequately preparing PIPs. Several conflicts and interruptions come to mind; a) call volume; b) administrative duties; and c) training requirements (Caussin, 2009; O’Leary, 2007). One disturbing answer in the survey was a response to the question on what methods are used to
complete PIPs. These questions looked to see what the most common method is. One of the methods listed was a drive by PIP visit. This question may have been misinterpreted by some of the participants. Forty two of seventy three participants, 57.5%, indicated they use the drive-by method to complete the plan. Eight participants indicated they used it 100% of the time. Interestingly the survey responses indicate that not one component of the PIP process is conducted annually. Sinsigalli (2007, p. 22) commented that the completion of the task is affected by the importance the organization places on the task. There must be support for the program from the top down. This is not accomplished by deadlines and threats of discipline alone, but by motivation that can be internalized and supported by the fire officer and firefighters themselves. Royse (2007, p. 23) states for a program to be successful it must begin with the mission statement and permeate all levels, with support from the command staff.

Several comments from the participants indicate they recognize the public relations value of the PIP process. They also express the concern that if company officers begin citing violations the business owners may stop allowing the PIP walk-through all together. Other officers expressed that our primary job is protecting the community and if we do not notify the occupant of a life safety code issue we are simply not doing our job. There were three questions on the survey that attempted to identify what role the company officer perceives their role is in fire prevention during a PIP walk-through. LSC violations were listed as a critical item to be observed and addressed during a PIP walk-through. Only 39% of the participants indicated it was a critical item they look for. Over 50% of the participants indicated they do not identify or address LSC violations when conducting a PIP walk-through. But the final question asked if the participant believed the company officer should address LSC violations during pre-incident planning; 78.4% answered yes. The responses to the first two questions seem to indicate that
LSC violations are not regarded to be a part of the company officers' responsibilities. But the third question is an abrupt about face that indicates the participants believe it is a responsibility. This contradiction can be understood by looking to the comments provided in the survey. Several officers express that, our job is to save lives and to overlook a LSC violation would be a breach of our sworn duty. Other officers add that if it could harm the occupants it makes it a danger to firefighters as well and must be addressed. The hesitation it appears comes back to a lack of knowledge and training. Many comment that they lack the training to recognize LSC issues and violations. One participant’s comment is echoed by CCFES Fire Marshal Jay Westbrook, the company officer should be trained to recognize and address them; but not to enforce the LSC. The company officer, working with the building occupant can proactively address LSC for the safety of the public and the firefighter.

There is room for improvement of the CCFES PIP program. The personnel and the department recognize the value of preplanning activities and the benefit of using a PIP to improve the safety of citizens and responders during emergency response. As one of the survey participant’s comment put it, “The PFP (PIP) should be used to build goodwill with the business and stress partnership”. For the pre-incident plan program to be successful it must be adopted fully into the culture. CCFES from the Fire Chief down has adopted a culture of safety on and off of the emergency scene. Pre-incident planning has not been fully embraced because it is not a routine part of the culture of the department. It has become another deadline and the risk of being on the ‘bad-list’. Until all personnel, especially the company officers, personalize the practice of prevention through planning the program will continue to be underutilized. Major (2008) observed that many of the departments surveyed do not take full advantage of the PIP programs already in place, CCFES is of no exception. King (2009) further reinforced that the challenge is
to make the change and not just talk about the need to change. The group that can and will make this difference is the company officer; the CCFES company officer must meet this challenge. But for the officer to be successful the department must equip and motivate these officers for the success of the fire company, the department, and the community.

Recommendations

The vision of the personnel of CCFES is to lead by setting a standard of excellence. The current execution of the pre-incident planning program in CCFES does not meet the vision or mission as described by the department. The pre-planning activity has become a chore and not a labor of love. As a department, CCFES is committed to the safety of the community and the personnel. Pre-incident planning is an opportunity for the department to reduce or prevent civilian and firefighter injury or death through aggressive pre-incident planning, community education, and firefighter training. The following recommendations are made in the spirit of honoring the vision and values of CCFES for setting a standard of excellence.

The first recommendation is for the CCFES Policy and Procedures Committee to review and revise CCFES Policy Section 6-22 Pre-Fire Plans (Pre-Incident Plans). The last revision of this policy occurred on August 20, 2009 to include the CCFES Standard of Cover Risk Assessment Matrix. It is recommended that NFPA 1620 Standard for Pre-Incident Planning 2010 Edition and the CPSE Standard of Cover Manual risk assessment model be adopted as the relevant guidance for this policy, it currently has none. The CPSE Probability and Consequence Matrix is already used in the policy and NFPA 1620 has relevant guidance that will strengthen the policy. The policy revision should also include the implementation of a required training and program that specifies initial and continuing education requirements. The policy and review and
revision should be completed within three months of the adoption of these recommendations by the Fire Chief and Command Staff.

The second recommendation is to require a comprehensive training and education program be developed and delivered to existing company officers. This program must include a review of national and local incidents where the lack of adequate pre-incident planning contributed to a) significant property loss, civilian injury or death, and firefighter injury or death; b) current policy and procedure for conducting pre-incident planning activities; c) real time hands-on practical pre-incident planning activities; and d) how to respond to and address life safety code issues during response and the pre-incident plan walk-through from the company level. The training should be linked to a policy revision and meet the education requirements of that policy. The development of this program should commence on the adoption of revisions to the existing pre-incident plan policy and begin delivery of the program within three months of adoption.

The third recommendation is to require a training and continuing education program for company officers and all personnel participating in the promotional process for the ranks of Fire Engineer and above a fire prevention and Life Safety Code awareness training. This program should address the general areas of the life safety code and how to recognize violations. Additionally the program should address how the department expects the officer to interact with the building occupant and owner to assure positive public relations are maintained and safety issues addressed professionally, consistently, and legally. The development of this program should commence on the adoption of revisions to the existing pre-incident plan policy and begin delivery of the program within three months of adoption.
The fourth and final recommendation is that all elements of the pre-incident planning program be reviewed every three years, beginning on the adoption of a revised Section 6-22 Pre-Fire Plan (Pre-Incident Plan) Policy, and adopting identified changes or improvements that will strengthen the development, delivery, and execution of pre-incident planning activities for fire prevention and response to include training, education, and resources.
References


