A Command presence, influence on first responder safety

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CERTIFICATION STATEMENT

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

Signed: ________________________________
Abstract

The problem is that the Providence Fire Department currently assigns one chief officer to a working structure fire or any other incident of equal magnitude. The purpose of the research is to determine if an additional chief officer on the incident scene would improve personal safety for first responders. The descriptive research method was used to identify current operational procedures used by the Providence Fire Department, along with opinions and observations as to the effectiveness of said procedures. Three questions were posed in an attempt to justify the validity of the hypothesis. What, if any, are the local, state, and federal codes that address firefighter safety while operating at, or on the scene of an incident? What, if any, are the safety factors for first responders that are similar in size to the Providence Fire Department using one, or two chiefs on the scene of an incident? What, if any benefits of having more than one chief officer on the scene of an incident do the members of the Providence Fire Department identify? Previous to these questions being answered a hypothesis was formed; an additional chief officer would prove to be beneficial to the safety of first responders used in the context established by the descriptive research method. Procedures included research of associated study documentation, written questionnaires, surveys, interviews, and personal observations. Results indicated that the presence of having a second chief officer on scene would alter, to a safer degree first responder safety. The addition of a second chief officer on the scene of a major incident was the primary recommendation according to study results.
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Introduction

Currently members of the Providence Fire Department (PFD) are a combination of both union and non-union members. The majority of the department is comprised of union members which includes individuals up to the rank of captain. Exclusive of the union ranks are the chief officers, both line and administrative. Although the minority of department members are non-union (management & supervisory), the majority of fire ground supervision, and experience can be found among the small group of eight to 10 individual line chief officers. The scope of experience mentioned previously pertains to the overall management of major incidents and structure fires. Functions of a major incident, not delegated to an individual as separate modules of the Incident Command System (ICS) are the responsibility of the Incident Commander.

Currently the PFD assigns one chief officer to a major incident such as a structure fire in a three story wood frame residential building or other incident of similar significance. Other incidents of similar magnitude receive the same dispatch of one chief officer. On a typical response, 36 to 40 first responders are sent to the scene of an incident (J. Taylor & M. Dillon, personal communication, August, 2010). The dispatched chief officer or eventually the Incident Commander are responsible for the safety and well being of the first 36 to 40 responders, along with the mitigation of the hazard without the assistance initially of an additional chief officer with the same level of experience and training.

In the late 1970’s and throughout the 1980’s there was a higher demand for fire suppression services than from the early 1990’s through present time (Bureau of Operational Control, Providence Fire Department [B.O.C. PFD], 1980 & 2009, p. 1). Members who were on the job from the early to mid eighties had the chance to gain the most fire ground experience for
the period encompassing the 1970’s through present day*. Over the past 20 years there has been an increased demand for Emergency Medical Services (EMS) and personnel trained to provide for the changing needs of the department.

As it was, years ago, when the need for fire suppression personnel and training dominated the infrastructure of the PFD, so today does the need for increased EMS overshadow the ever decreasing firefighting aspect of the job. As is with any profession or trait the more often that it is practiced or put into use, the more proficient those individuals performing the task become. Not only is a higher level of proficiency obtained through repeated actions, but an increased level of safety is also achieved.

According to the PFD Division of Training (DOT), since 1990, 285 candidates have been trained and hired by the PFD with greater emphasis and more time being placed on the medical training that was previously allotted for firefighting tactics (R. Blais, personal communication, October 4, 2010). This change in the training trend coupled with the reduction in fire related calls has led to a generation of firefighters that are very good at providing EMS in a safe and effective manner, yet lack experience in skills on the fire ground. Left unobserved by a chief officer, less experienced firefighters and officers alike could be more susceptible to injury than those members with more experience. Members with less experience that are supervised by a chief officer have less chance of being injured.

The problem is that the PFD currently assigns one chief officer to a working structure fire or any other incidents of equal magnitude. The purpose of this research is to determine if the addition of a chief officer would improve personal safety for first responders.

* From January 1981 through December 1984 Providence recorded 4,283 fires. Of these cases, building fires accounted for 1,265 incidents (Conley & Campbell, 1985, p. 351).
A descriptive research method will be applied in an attempt to answer the following questions. What, if any, are the local, state, or federal codes that address firefighter safety while operating at, or on the scene of an incident? What, if any are the safety factors for first responders that are similar in size or operate in a manner similar to the PFD using one or two chiefs at the scene of an incident? What, if any benefits of having more than one chief officer on the scene of an incident do the members of the PFD identify?

Research will be conducted through a series of questions, interviews, surveys, material review, and personal observations with members of the PFD and ranking members of other departments. A brief, open ended answer survey will be sent to other departments where verbal communication is not possible. Local, State, and Federal codes will be researched to determine current compliance levels by the PFD. An attempt will be made to do an injury comparison if enough data is gathered when one chief officer is on the scene and when two chief officers are present

The hypothesis is that an additional chief officer would prove to be beneficial to the safety of first responders used in the context established by the descriptive research method.
Background and Significance

The city of Providence R.I. occupies a land area of 18.1 square miles, along with 1.9 square miles of water & water front (City of Providence Finance Department, 2007, p. i). Along with the 171,483 individuals that live in Providence (True Knowledge, 2010, para. 1), there is a daily influx of approximately 67,510 people who work in the city bringing the weekday population in the city to approximately 238,993 (Rhode Island Department of Labor & Training, 2000, p. 31). The PFD is charged with the protection of life and property within these boundaries.

The PFD became a paid, professional department on March 1, 1854 making it the second oldest professional fire department in the United States (Conley & Campbell, 1985, p. 35). As early as the 1970 the PFD operated 15 engine companies, eight ladder companies, along with three EMS units. Due to the ever evolving economy and demographic changes within the city, the PFD has had to adapt and change the way it operates. The type of services required has dictated the current make up of the department with regards to apparatus, training, and personnel. Today’s PFD is quite a bit different than that of 40 years ago, and is expected to change at a rapid rate over the next five to ten years (M. Dillon, personal communication, September 24, 2010).

The current staffing of the PFD is approximately 600 members which includes such divisions as fire suppression, EMS, DOT, automotive maintenance, Fire Prevention Bureau, (FPB), marine division, and, an administrative department. The fire suppression division consists of 14 engine companies, eight ladder companies, one heavy rescue, six advanced life support (ALS) EMS units, and three (soon to be two) district chiefs. Fire suppression units are staffed with three to four personnel and the EMS units are staffed by two members each. The
shift in apparatus allocation since the 1990 clearly reflects the trend of ever increasing EMS incidents and experiences, accompanied by a decrease in fire suppression responses.

The lack of experience that firefighters and company level officers have, has led to an increased burden on the chief officer or (IC) that is charged with the responsibility of providing for the safety of all members operating on the fire-ground. At any given time there can be four sides to an incident; one chief officer on the fire ground can not be expected to provide direct observation and supervision of all members thus, increasing the potential for injuries or procedural mistakes. No matter how well trained or experienced, the incident commander can only be in one place at any given time.

The role of the chief officer as affiliated with the use of the (ICS) within the PFD since 1985 has remained the same with regards to assigned duties and responsibilities (M. Dillon, personal communication, October 1, 2010). Upon arrival of a chief officer at a building fire, or similar incident, it is the initial duty of the chief, after assuming command, to do an initial size-up of the structure. The initial size up of the four sides of the building can be time consuming depending on the overall dimensions of the structure. With four sides to be viewed there is only a limited amount of time an IC is allowed to spend on each side before he returns, and remains on the incident named side of the building, or the command post.

From 1985, and up until six months ago, the aforementioned command practices have been in place until certain safety questions began to arise at the suggestions of the chief officers responding to full scale incidents (D. Crowley, J. Mirza, & P. Thomas, personal communication, October 7, 2010)*. Beginning six months ago according to an informal agreement between working line chiefs and administrative chiefs the practice of having a second chief respond on

* The above mentioned individuals are Deputy Assistant Chiefs (DAC) and Battalion Chiefs (BC) who are line chiefs that frequently are incident commanders dealing with safety issues and incident management decisions.
his or her own accord to all reports of structure fires or large scale incidents was implemented. For the last six months two chiefs have been responding to major incidents in an attempt to increase first responder safety and establish the viability of two chiefs operating in unison with a positive outcome.

As was previously mention the PFD currently operates three districts under the supervision of two battalion chiefs and one deputy assistant chief. A contract currently approved as of October 7, 2010 will reduce the number of chief line officers per shift from three to two by the end of 2010.

This paper is being prepared in order to satisfy the applied research project portion of the Executive Development (ED) program which is part of the Executive Fire Officer Program (EFOP) offered through the National Fire Academy (NFA). The research uses the descriptive method which will provide data and information that will be made available to decision makers within the community in order to make decisions that would benefit the PFD and the City of Providence alike. The intent of this paper is to provide facts by examining the strengths, weaknesses, opportunities, and threats (SWOT) of the PFD, the standards and codes that govern the PFD, the procedures and tactics used by other departments, and the opinions of those who will be affected. The strength of the PFD is the ability to deploy a large number of first responders and equipment to an incident scene due to the resources available, and the rather small area that has to be protected. A major weakness of the PFD is the lack of practical experience that the majority of the members possess when it comes to mitigation of large fires in three and four story wood frame structures, and other incidents requiring immediate supervision to avoid serious injury or death. The PFD has the opportunity to train extensively under the tutelage of some very experienced chief officers who have had the opportunity to work under
rapidly reoccurring practical fire conditions. The greatest threat facing the PFD is limited supervision; there currently is not enough supervision on the scene of an incident to identify and correct the preventable risk factors that lead to injury and death. It is important that this applied research project produce results, whether it is definitive answers to the proposed questions, or the elimination of the hypothesis along with the knowledge base used to explore the possibility of whether or not a difference can be made. ”Most fatal fires and most property loss occur in residential fires ”(Klaene & Sanders, 2000, p. 338). The majority of structure fire responses by the PFD are residential, thus the relevance. An additional element to this research project pertains to the suggested amount of duties required of the IC as they relate to firefighter safety. According to a book “Structural Firefighting” by Bernard J. Klaene & Russell E. Sanders, there are 73 size-up items that an incident commander must consider when evaluating an incident and safety issues. Is it possible for one chief officer to effectively manage an incident with so many duties requiring not only knowledge, but experience?
Literature Review

The ICS was first developed in California in the early 1970’s in order to deal with catastrophic wildfire incidents, and was later adapted by the Phoenix, Arizona fire department for use at structure fires. Although begun in the 1970’s, the ICS did not go national until 2003 with the passage of Homeland Security Directive number five “mandating” all local, state, and federal agencies to use the ICS in order to receive federal funding ("Incident command system", 2010, para. 3). Since gaining national acceptance the ICS has been renamed the “National Incident Management System” (NIMS) (http://www.fema.gov/emergency/nims/). The original name of the system has evolved into a more refined and definitive definition, so have opinions towards the original concepts and how they affect safety issues. The original intent of the incident command system was to break down a complicated issue into smaller more manageable modules.

As the incident expanded so did the number of sectors to deal with the size of the incident, leaving one person responsible for managing 3 – 7 units or first responders, with five being the optimal amount (Providence Fire Department Division of Training, 1993, p. 8). As can be seen in the fully exploded model, the ICS system can encompass a large contingent of individuals, locations, and functions at a major incident (see Appendix A). There are however exceptions to the ICS which are practiced successfully by numerous departments throughout the United States. Alterations to the ICS under certain conditions have evolved through experience and tragedy alike. There are two main directions that the ICS can vary according to published literature, surveys, and personal interviews. One is less supervision for increased numbers of first responders on routine incidents, and the second is increased supervision for fewer first
responders at incidents that are rarely encountered. Both directions have first responder safety as the primary supervisory level (Brunacini, 2002).

According to National Fire Protection 1500 section 8.1.7 “at an emergency incident, the incident commander shall establish an organization with sufficient supervisory personnel to control the position and function of all members operating at the scene and to ensure that safety requirements are satisfied” ("Standard on fire department occupational safety and health program", 2002, table 8.1.7). Past research has focused mainly on applicable codes such as the previously cited national standard. Codes that are not followed are the building blocks that could eventually lead to departmental liabilities such as was the case in the District of Columbia; in which the families of two deceased and two severely injured firefighters filed separate civil rights actions suits under 42 U.S.C. 1983 against the district, Chief Donald Edwards, and three other district officials including two other non-chief fire officers that were on the scene and made critical decisions along with decisive actions (Comstock, Jr., 2009). While many of the aspects of the case are still pending, it is apparent that the door has been opened for legal action against fire officers who are given tasks beyond their training and experience level, and failed.

In the above mentioned incident it will never be known whether or not an additional chief officer would have made any difference, but it does lead one to believe that more experience and training of the officer in charge (a chief) could have had a more positive outcome on the safety of the first responders (Klaene & Sanders, 2000, p. 60-61).

The majority of literature review material found so far portrays’ the consequences of not having enough chief officers on scene resulting in serious injury and loss of life. A prime example of this is the Worcester Cold Storage Warehouse fire. A second chief was not dispatched until the second alarm was struck, where the addition of a second chief on the first
alarm could have helped identify the severe life hazard to first responders prior to commitment of personnel that ultimately perished. In a book by Mark Haraway a good point is brought to light about the need for additional chief officers.

Mark Haraway, in his book, “Large Scale Incident Management” explains a few situations when a single incident requires two chief officers. The first is when the span of control is exceeded (more than 7), or the incident is of geographical proportions that are beyond the abilities of one chief to monitor (Haraway, 2009, p. 27-28). As a personal observation I would like to offer a third situation; a second chief officer should be added to altered to some degree the outcome of the incident when first responders have a low level of experience. No data has been collected or documented that would indicate that an additional chief has made a difference as to the safety of first responders, but observations were made of other fire-ground operations that were being performed more efficiently with a second chief on the scene. Communications, size up, building construction, and progress of the incident are a few of the more noticeable ones. These observations were confirmed after speaking with other chief officers of the PFD (M. Dillon & A. Horton, personal communication, October 1, 2010).

An extensive search for studies conducted concerning the viability of a second chief officer on the scene in the library at the Learning Resource Center (LRC) did not provide any direct information concerning additional chiefs and first responder safety. However, the literature revue from the library’s data source did provide some information that could possibly be used in support of the hypothesis. Many studies were conducted on firefighter safety with regards to the reduction of serious injury and death. There were many alternatives and options proposed, but none dealing specifically with the addition of a second chief. Possible solutions in
reducing firefighter injury and death ranged from increased personnel (unspecified rank in most cases) to increased training at all positions.

One Executive Fire Officer (EFO) paper that was reviewed contained information indicating additional personnel would satisfy the need to meet national safety policies which in turn would ensure a safer operating environment for first responders. The paper cited a typical situation involving a residential house fire. A question was asked of neighboring departments and departments of similar size inquiring as to the number of personnel sent to a typical residential fire 15 years ago and how many members currently respond. Once the responses were compiled and averaged, it was found that a residential fire today requires eight more first responders than the same fire 15 years ago. While the increase in personnel could indicate an additional chief, the questioning failed to specify where these additional members would be used, and gives no indication that any of the extra responders would include a chief officer (Grammer, 1998).

Before any surveys or questionnaires were sent out, the author was aware of a fire department that sent two chiefs on all reported residential structure fires. The Philadelphia Fire Department sends two chiefs to all reported residential structure fires as a matter of standard operating procedure. In hopes of gaining information on the effects of two chief officers at a residential fire and how the policy initially came about, Deputy Commissioner of Operations Ernest Hargett of the Philadelphia Fire Department was contacted. After a brief conversation with Deputy Commissioner Hargett it was determined that the reasoning behind the response of two chiefs was two fold. First was the geographical issue; Philadelphia residential housing consists of row houses that are a block or more long. This makes it virtually impossible for one
chief to do a 360 degree survey of the entire building in a short amount of time and return to the command post.

The second reason for the additional chief is for the safety of the first responders along with the knowledge and experience a command level officer possesses (E. Hargett, personal communication, June 14, 2010). When questioned as to how and why the procedure was initiated, Deputy Commissioner Hargett stated “It was that way when I came on the job” and agreed to send a hard copy of department procedure regarding residential structure fire response (E. Hargett, personal communication, June 14, 2010). Upon receipt of Directive #39 from the Philadelphia Fire Department it was confirmed that two chief officers were sent on all incidents where there was a high risk to benefit situation regarding first responder safety. There is a vast amount of literature available on the history and current operational procedures of many individual fire departments many of which are similar in size to the PFD. What seems to be missing is the reasoning and statistics associated with the underlying factors that initially resulted in the response of a second chief officer to a structure fire. As far as recorded information or research done from a fire departments’ perspective regarding first responder safety and the number of chief officers on scene, there have been no extensive statistic bearing results in the fire service. Given the limited scope of fire service studies, other areas of supervisory / employee safety ratio effectiveness will be examined.

The National Institute for Occupational Safety and Health (NIOSH) which is called upon frequently to help investigate firefighter fatalities and serious injuries uses insurance companies as sources of information when making recommendations regarding accident prevention and associated programs for all industries including fire departments. One such company is the SeaBright Insurance Company.
While the profession of a firefighter is not necessarily the safest job, there are some suggestions and recommendations from NIOSH as culled from the data base of SunBright Insurance Company that can be applied as general practices applying to safety in almost every type of job. Sun Bright Insurance makes the following suggestions:

**Use the knowledge and experience you possess** to orient and train your employees in the correct way to do their job tasks. Be prepared when you conduct your safety meetings and solicit input from your crews. Perform safety inspections regularly to identify unsafe acts and conditions, implement corrective action and follow up. Additionally, utilize the resources that are available to you from your own safety department, fellow supervisors, and your safety committee or through SeaBright’s Loss Control Department. (SeaBright Insurance Company, 2010, para. 9).

Review of local codes revealed nothing that superseded federal codes when compared to incident management and first responder safety. There were however state codes that were specific to fire prevention issues that surpassed federal guidelines, yet were not pertinent to chief officers and first responder safety. The two prominent federal agencies that have code compliance requirements pertaining to the PFD are NIOSH, and the NFPA. NIOSH is predominately an investigative and data based resource agency. On the other hand the NFPA has hundreds of mandates regulating fire department operations; including a standard that targets the specifics of incident management. NFPA standard 1561 “Standard on Emergency Services Incident Management System” was mandated and approved as an “American National Standard” (ANS) on December 31, 2007.

According to NFPA 1561 Annex E.3 the description of and functions of an Incident Advisory Team is described with strong evidence supporting the need for additional command
level officers. A key element of this standard includes a team of three individuals who are command level oriented (chief officer) whose primary duty is designed to increase the effectiveness of command and first responder safety at the most critical time of the incident. The standard goes on to further explain; that to further rely on a single individual acting as an IC to manage today’s complex incidents is unfair to that individual, citizens of the community, and first responders ("Incident Advisory Team", 2008, Chapter Annex E). This is a clear indication of the recognition for additional chief officers at a major incident by a federal agency empowered to enact laws, enforce mandates, and strongly advise through research, training, and case study.

Another NFPA standard states that when inexperienced members are working at an incident, direct supervision shall be provided by more experienced officers or members (National Fire Protection Association [NFPA], 2003, p. 1500-22).

The U.S. Fire Administration (USFA) along with the National Fire Protection Association (NFPA), (NIOSH), and the International Association of Firefighters (IAFF) conducted a multi part study into first responder Line of Duty Deaths and injuries (LODD). The study produced four separate clusters each with sub topics that were believed to be associated with LODD. Included in the first cluster sub topics were Incident Command, Standard Operating Procedure (SOP), and training issues. In cluster number four apparatus staffing and Standard Operating Guidelines (SOG) were addressed. The study had two main divisions; contributing factors to firefighters LODD in the United States (U.S.) and contributing factors to fire fighter injuries in metropolitan areas in the U.S. (United States Fire Administration [USFA] 2010). The study was published by the IAFF ("Contributing factors to firefighter line of duty injury study", 2008).
According to Rand Science and Technology in a Study of Emergency Responder Injuries and Fatalities approximately 88,000 first responders are injured every year; about 2000 of their injuries are life-threatening (Houser, Jackson, Bartis, & Peterson, 2004, para. 2).

It would not be fair to conduct a literature review without including references and points of view that are contrary to the hypothesis. In a recent conversation it was pointed out by the chief of a neighboring department that a two chief response was not feasible due to the fact that his department only assigned one line chief per shift due to the make up of the jurisdiction (M. Pare, personal communication, June 14, 2010). In other conversations it was the belief of administrators that given the advancements in the ICS, one chief officer should be able to handle a structure fire and account for the safety of all first responders. On the surface it appeared the previous statement to be totally factual. Further investigation proved this to be only partially true; a secondary factor that proved to be more interesting was the financial situations of many cities similar in size to that of Providence. Although there was no direct link found in the review, a reduction in all departments within the city of Providence seems to correlate the reduction in services and safety.

The City of Providence is currently in the process of reducing chief officer staffing from three chiefs to two chiefs per shift. This was brought about by contract negotiations between the city and the local chapter of the union (G. Farrell, personal communication, October 7, 2010). This decision is based on financial issues rather than safety issues. The City of Providence is also instituting a new response policy to structure fires for chief officers. The SOP will have two chief officers responding to all major incidents including structure fires and will be implemented sometime in December (M. Dillon, personal communication, October 1, 2010). It is yet unknown the intent of administration for the addition of a chief officer to confirmed structure
fires as there are no records indicating a reduction in injuries or property loss by making this change.
**Procedures**

The descriptive research method will be used on this project to best answer the three questions in the proposal. What, if any, are the local, state, or federal codes that address firefighter safety while operating at, or on the scene of an incident? What, if any, are the safety factors for first responders that are similar in size to the Providence Fire Department using one, or two chiefs at the scene of an incident? What, if any, benefits of having more than one chief officer on the scene of an incident do members of the Providence Fire Department identify? In order to justify findings, the above questions will be answered using surveys, questionnaires, interviews, personal observations, and reference material reviews.

In order to obtain accurate and diversified answers to these questions it was necessary to use a rather broad base of research methods which include but are not limited to the following: data base research information, surveys, interviews, questioners, text reviews, and search for legal statutes (local, state, and federal) as they relate to first responder safety while operating at the scene of an incident.

On the local level an interview was requested and granted with Fire Marshall Anthony J. Di Giulio chief in charge of the FPB and head of fire code enforcement for the city of Providence. During the course of the interview the general question of what city codes pertained to firefighter safety at the scene of an incident were posed to Marshall Di Giulio. Fire Marshall Di Giulio was selected because of his knowledge of fire codes and regulations at the local level. The Interview took place at PFD headquarters, located at 325 Washington St. Providence R.I. on October 10, 2010 at 1300 hrs (A. J. Di Giulio, personal communication, October 10, 2010). Also consulted as a possible resource on local code was the PFD’s Departmental Investigative Officer (DIO) and the Assistant Chief of administration due to the fact both individuals have extensive
legal code background. In a conversation with the previous two chiefs, they were unaware of any local standards or codes pertaining to firefighter safety and was told to refer to national standards (M. Morgan & T. Warren, personal communication, October 10, 2010).

The city of Providence’s legal department was contacted also in an attempt to determine if there were any liabilities attached with the response of one or two chiefs to an incident regarding city ordinances or matters pertaining to the collective bargaining agreement between the city and the firefighter’s local union. In a final effort to explore all possibilities at the local level, the PFDs local website was researched at which point all research was directed to the state level (Providence Fire Department, 2010, expression FAQ's)

On the state level research was begun at the State Fire Marshall’s office, and an interview was conducted with Chief Deputy State Fire Marshall R. Michael Di Mascola. This individual was selected due to the fact that he was previously the chief of the PFD and is familiar with, and has complete access to state codes that would pertain to first responder safety on the scene of an incident. Fire Marshall Di Mascola was interviewed on 24 Aug 2010 and was asked the same general question that Marshall Di Giulio was asked “what codes at the state level pertain to the safety of firefighters on the scene of an incident” (R. M. Di Mascola, personal communication, August 24, 2010) Also, an attempt was made to contact the Rhode Island State Association of Firefighters (RISAF) to seek information that the association might have accumulated over the course of time having contact with all fire departments in the state of Rhode Island (RISAF). Although the RISAF has no legal powers to enact codes, the association is in a good position to act as a central point for a collection of data and dissemination of results.

The Rhode Island Association of Fire Chiefs (RIAFC) was also contacted seeking information from a chief officer’s perspective on established codes and perceived safety issue
from a large body of individuals who are not only highly trained, but have hundreds of years of combined experience. An interview was granted on October 7, 2010 with the President of the RIAFC, Chief George Farrell. Chief Farrell was chosen due to the fact he is the president and spokesperson for the organization, and has close personal ties with the majority of the members in the Chief’s Association. Chief Farrell was asked to inquire if any members of the RIAFC were aware of any standards or codes associated with first responder safety, along with a general consensus of whether or not the addition of a chief officer would alter the degree of protection afforded first responders (G. Farrell, personal communication, October 7, 2010). Having culled various sources at the state level, additional information was sought at the federal level.

The predominant agency charged with code development, implementation, and enforcement at the federal level is the NFPA which is a division of the USFA. The NFPA has literally thousands of codes and regulations, all of which are available at a price. After visiting the NFPA website two code books were ordered that appeared to have the most information pertaining to the project at a cost of $30.00 per manual. Ordered were NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments 2010 Edition and NFPA 1561 Standard on Emergency Services Incident Management System 2008 Edition (National Fire Protection Association, 2010, expression Codes and Standards). NIOSH will also be consulted for any information pertaining to the research project although NIOSH is predominately an investigative agency dealing with serious multiple injuries and LODD.

Code inquiries were limited to cities within the state of Rhode Island on the local level and Rhode Island itself on the state level. All agencies at the federal level perceived of having legal authority will be explored.
In order to gather information on the use of a second chief officer on the scene it will be necessary to contact other fire departments and request information on current policy and procedure. This can be accomplished through phone interviews and surveys (best used for departments that are distant, yet similar in size to the PFD). In person interviews and personal observations will be used for departments that are in the vicinity to the PFD. Due to the nature of the research project the method used was descriptive. Although it is recommended that survey questions be closed ended in order to ensure accuracy in a controlled response manner, open ended questions were used in this survey in order to better gather information due to the limited amount of subject specific material found during the literature review.

A survey was sent out to 30 departments which consisted of ten questions that required open ended answers (See Appendix B). First and foremost the questions posed are directly related to the three applied research project questions. The balance of the survey questions were directed to departments that currently send two chiefs to a working fire. In order to eliminate surveyed departments that do not send two chief officers, the first question of the survey is of significance (see appendix B). The selection of departments surveyed is based on two prominent relationships to the PFD.

The first factor took into account departments similar in size to the PFD. The second factor sought out departments that are metropolitan and are located within a 200 mile radius of the City of Providence. The survey was distributed via an internet site called “Survey Monkey” (http://www.surveymonkey.com/). Departments were notified by cover letter that all responses would be confidential and that the results of the research project would be made available to them in thanks for cooperation. Major metropolitan departments that are in close proximity to the PFD were also requested to conduct a phone interview in order to obtain additional
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information that was not sought in the general survey. Interview questions were the same for all departments that were willing to participate.

Separate interview questions included, “do you have any records or documentation of first responder injury reduction with more than one chief officer on scene?” The second question “will request hard copies of documentation in order to conduct a comparative analysis with the PFD.” The final question will “ask for experience based advice on how to track and implement a program targeting chief officers, and first responder safety on the incident scene.” Phone interviews were requested of chief officers having jurisdiction from the following cities: New York City Fire Department (FDNY), the Philadelphia Fires Department, the Boston Fire Department, the Worcester Fire Department, the New Haven CT. fire Department, the Hartford CT. Fire Department, and the Tempe, AZ Fire Department. The previous departments were chosen based on there size, experience, expectations of accurate record keeping, and accessibility to personnel willing to participate. To keep the interviews short and to the point, all responding departments will be asked the same three questions.

In order to gain information on the third question of the ARP, “What if any benefits of having more than one chief officer on the scene of an incident do the members of the PFD identify?” The starting point was a questionnaire handed out to members of the department of all ranks in all divisions. The questions can be found in Appendix C. Along with the questionnaire a request was made to interview the following officers based on knowledge and credentials: Chief of the department (COD) George Farrell, chief of the PFD, ultimate final decision maker on all policies, and former State Fire Marshall. Assistant Chief of Operations Michael Dillon, 37 year member of the PFD, accredited instructor of the incident command system, highly knowledgeable with NFPA codes, fully qualified safety officer and instructor. Department
Investigative Officer (DIO) Michael Morgan, who is charged with tracking injury and their mechanisms. Chief Morgan since being appointed DIO has put together an accurate tracking systems associated with injury type, location, personnel involved, and the type of incident where said injury took place. Chief of the (DOT) James Gallant, who has directed all recent training schools, oversees development and testing of all new policies and procedures, and is an accredited instructor in many fire-ground and safety related issues. The afore mentioned individuals were chosen based on their individual attributes along with their combined ability to determine what is and is not beneficial to the PFD.

There are also limitations that apply to the procedures being used. This study has been primarily directed towards the benefits and feasibility of having a second chief officer on the scene and the added safety that would be provided. Although touched on in one of the surveys, there has not been much concentration of how implementation should occur. This project does not pertain to volunteer or paid on call departments. Also, financial liabilities associated with the additional chief officers were noted but not addressed. While many incidents will require more than one chief officer, this research project is directed towards the function of chief officers on the scene of a three story wood frame residential structure fire.

Also, the nature, severity, and mechanism of injuries on the scene were not included in the research project. The exact location on the scene (if in the structure the exact location, or if outside, the exact location) of individuals are not being defined.

This applied research project was designed to benefit the PFD rather than the use of the results when applied to any other fire department regardless of similarities with relation to department size or location. It is however hoped that the material contained within could somehow benefit other departments having issue with any portion of the study. The surveys,
interviews, and questionnaire procedures were used as tools to gather information rather than use the results as a consensus as to how things should be done because the majority of other departments do it a certain way. The participation and number of responses from other departments can not be determined at this time. Also due to ongoing contract issues with the local union, participation and validity of responses from union members of the PFD could alter the research, based on monetary values and bias towards chief officers that are not in the union.

Finally, the research project does not take into account the number of injuries incurred when there is more than one chief officer on the scene.
Results

The results were not as dramatic and conclusive as at first thought. While much of the resulting information was predictable, there were also some surprising findings related to the expected responses to some of the procedures listed. A quick overview shows that the requested information was provided by some individuals and departments that were asked to respond while others either did not have answers and opinions, or elected not to respond due to other reasons. The procedure steps on code application was straightforward due to the fact that most codes, laws, and mandates are of public record, and with proper research were obtainable.

During the interview with Fire Marshall Di Giulio to determine local codes as they pertain to first responder safety none were found. According to Marshall Di Giulio all codes at the local level are directed towards the protection of the civilian population which includes: smoke detectors, means of egress, and building code compliance just to name a few. The only involvement of the first responder is the enforcement of certain codes. Most local codes are adopted from codes at the state level (A. J. Di Giulio, personal communication, October 10, 2010).

At the state level Chief Deputy State Fire Marshall R. Michael Di Mascola when asked the same question concerning standards and codes at the state level that Marshall Di Giulio was asked the reply was very similar. The State Fire Marshall’s office is charged with the protection of the average citizen and has considerable oversight of all construction codes within the state both commercial and residential. The State Fire Marshall’s office is an enforcement and educational agency, along with jurisdictional input into laws being considered that pertain to fire codes. To date there have been no laws or legislation introduced that would mandate first responder safety standards (R. M. Di Mascola, personal communication, August 24, 2010).
A phone call was made to the Rhode Island State Association of Fire Fighters. This is a lobbying body at the state level that works on behalf of unionized firefighters at the state house with proposed legislation that could affect firefighters. The majority of these issues are monetary in nature. It is believed that no call was returned due to the fact that the author is not affiliated with any union. After researching at the local and state level and consulting different government agencies, there appears to be no codes or regulations governing first responder safety while operating on the scene of an incident. It is clear that first responder on scene safety has been relegated to the federal level with little monitoring taking place at the local or state level with the exception of each individual department policing itself in accordance with federal codes.

The governing body at the federal level is the USFA. Research shows that the USFA has the legal authority to enforce codes and regulations that have been researched and developed by the NPFA. Although other federal agencies such as the NIOSH and the Occupational Safety and Health Administration (OSHA) function to provide for first responder safety, it is the NFPA that conducts testing and develops codes that address all aspects of fires, first responders, prevention codes, and equipment specifications just to name a few. The NFPA was established in 1896 and has since developed thousands of codes and standards.

NFPA 1500 is a general standard used as a starting point for all training, equipment, apparatus, staffing (ICS based), fire-ground operations, response times, and safety issues. Each one of these standards along with many others is broken down into smaller, more descriptive codes that are specific to the many aspects described in NFPA 1500. The two codes that specifically govern Incident Commanders (chief officers) duties and first responder safety were found in NFPA 1561 Standards on Emergency Services Incident Management systems & NFPA
1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by career Fire Departments. The language of these codes determines whether they are laws or suggestions. Any code or subtitle containing the word shall is considered law and must be adhered to by the Authority Having Jurisdiction (AHJ). On the other hand if the word being used is should rather than shall, it is considered to be a suggestion only. AHJ needs to abide by this only if they are a federal agency, or if they are a local city or state receiving federal funding for any training or equipment.

NFPA 1561 refers in a few different subsections to situations where more than one IC will be needed and also the responsibility of managing responder safety. NFPA 1561 requires the Emergency Services Organization (ESO) to prepare plans based on the ICS that address different types of situations that might be encountered. The code further states that the ESO also prepare a plan for assignments of supervisory personnel for situations of different sizes and complexities ("NFPA 1561 Standard on emergency services incident management system", 2008, Chapter 4). Also noted in NFPA 1561 is the management of risk levels (safety concerns with regards to risks vs. gains) and 13 points that should be addressed. Two of the key points that would apply to the research project include effective incident management and communications along with experience based on previous incidents ("Incident action plan", 2008)

NFPA 1710 states that the number of fire suppression personnel on scene shall be sufficient given the expected fire conditions and that the amount of chief officers be considered based upon the experience and training of first responders. The number of responders on scene shall be determined to provide for safe and effective firefighting conditions for members on the scene (NFPA 1710 Standard for the Organization and Deployment of Fire suppression
operations, emergency medical operations and special operations to the public by career fire departments, 2009).

A review of the website from OSHA proved to be a valuable tool for various codes pertaining to a multitude of fire related items including member safety. There was however no statistics, data, or case study that provided any link between the number of chief officers (supervisors) on scene and first responder injuries (Occupational Safety and Health Administration website, n.d.). The same holds true for NIOSH, while not solely responsible for fire department safety issues, NIOSH has investigated many LODD of first responders, but does not provide any correlating data between chief officers on scene and first responder (Center for disease control and prevention website, 2010).

It appears that all agencies having jurisdiction, or assisting in the development of codes have done a tremendous job in trying to keep first responders safe from all incident scene hazards. After a through review no results were found on any level associating the number of chief officers on site at a residential fire and the resulting injuries to first responders. NFPA codes refer to numerous mandates regarding the duties of ICs and chief officers along with steps to be taken by first responders to reduce injuries. To date there are no codes that state two chiefs shall respond to a structure fire to increase safety issues. Only language that states additional experienced command staff should be on scene to increase the possibility of risk reduction. When checking with other fire departments results were a little more positive.

In order to answer the second question a 10 question survey was sent out to 30 different fire departments. This was a selective survey not a random selection in order to gain specific information as was explained in procedures. All of the following questions came from Appendix B. Of the 30 departments that were requested to reply, 24 responded to varying degrees. The
reason for this was either confidentiality, or, the simple fact that they had no information on the subject. Even though it was noted that all responses would be anonymous so as not to associate or create a biased opinion from the study towards the responding department.

Response to question B1 were slightly varied, 22 departments sent, at a minimum, two chiefs or more, while two departments only sent one, which were based on availability factors.

Response to question B2 came from 21 of the 24 departments. Position assignments were determined by the first on scene chief officer (IC) or the second chief officer assumed a roll that was related to first responder safety issues. The majority of the responses were geared toward a safety position.

Response to question B3 once again came from 21 departments. All of the departments responded the same stating that the second chief officer would be part of the command staff, and, if needed, could be redeployed from that position most likely to a safety officer/observer position.

Response to question B4 was from 21 departments also but was a little more varied. One department stated that they were not aware of any difference in safety factors for first responders when there were one or two chief officers on the scene. The remaining 20 departments responded with answers that all address the primary reasons why first responders are injured on the scene. Answers included: Accountability, manageable span of control, hazard identification, and scene safety (properly worn personal protective equipment). One department’s response helps to address the problem that the PFD is having. The unknown author states “Due to the vast difference in experience of first responders, the chief officer gives a level headed approach to firefighting operations”. There is no citing of the previous quote due to the fact that the survey response was anonymous.
Response to question B6 was from all 24 departments. Question B6 was answered by many of the same answers that were provided for question B5. A few exceptions were keeping junior members from putting themselves in harms way, and better communication from one sector to another.

Response to question B7 was from all 24 departments again. All responding departments replied with a resounding yes. Indicating safety, strategy, and accountability were eased at the command and control level with the presence of an additional chief.

Response to B8 was from 21 departments. The majority of the departments responded in three major ways; in order to comply with NFPA 1500 standards, to comply with the ICS or an updated version of the ICS referred to as the NIMS, and some said they did not know that it has always been that way since they came on the job.

Response to B9 was the same from all 21 departments. The only negativity was the same from all departments, and lead to the fact of personality conflicts initially, but once that problem was resolved there were no further adverse affects.

Response to question B10 was only from 8 departments. This can be attributed to the fact that in question B1 most departments responded with a two or more chief officer response. Responding departments stated that they would never go back to one chief officer at the scene of an incident even given financial restrictions they would not compromise safety.

All respondents to questions were thanked in advance and offered any new information that might be developed by this research project. Aside from the questionnaire that was sent out to 30 departments, appointments were requested to conduct phone interviews with chief officers of seven major departments that are listed in the procedure section. Of the seven requested, five were granted. Of the five granted, four were sent the questionnaire listed in appendix B previous
to the phone interviews. These departments were chosen based on size and vicinity to the PFD, along with the fact that they are all metropolitan departments.

Initial contact with the departments included an introduction, the purpose of the call, and the information being sought. The three questions used in the interview can be found in the procedure section. For purposes of convenience they will be stated here again in close proximity to the responses. Do you have any records or documentation of first responder injury reduction with more than one chief officer on the scene? Question two requested hard copy documentation in order to conduct a comparative analysis with the PFD. The final question will ask for experienced based advice on how to track and implement a program targeting chief officers, and first responder safety on the scene.

On 14 Jun 2010 @ 1200 hrs Deputy Commissioner of Operations Hargett for the Philadelphia Fire department was contacted and asked the three interview questions. He stated that he would not be able to release on scene injury records but agreed to send along documentation of staffing response policies to fires that were similar to those encountered by the PFD, which he did in the form of Directive #39 dated September, 2004. According to Deputy Commissioner Hargett, they do keep records of injuries both on the scene of an incident and injuries incurred elsewhere. He further stated that they do not compare the number of fireground injuries with the number of chief officers on the scene. Deputy Commissioner Hargett recommended that in the best interest of first responder safety it would be better to implement a two chief officer response policy rather than sacrifice avoidable injury to conduct a survey which in his opinion would find a reduction in injuries with a second chief on the scene anyhow (C. Hargett, personal communication, June 14, 2010).
Assistant Chief DeLiddo of the Worcester Fire Department was contacted on 14 Jun 2010 @ 1300 hrs and responded to the three questions. The department’s record keeping of injuries was not listed by location and situation. Records were based on the type of injury, therefore making it difficult to discern where the injury took place, let alone how many chief officers were present. Chief DeLiddo was willing to discuss injury type and those associated with on scene operations but would not be able to pass along hard copies due, once again, to confidentiality reasons. When questioned about starting a program using two chief officers immediately, he simply stated “do not wait a moment and learn the value of a second chief officer on the scene the hard way, as we did” Chief DeLiddo was referring to the loss of six Worcester firefighters on December 3, 1999. He further stated that the Worcester Fire Department has limited staffing and sometimes experiences delays in getting a second chief officer to the scene of an incident. This is similar to what the PFD is about to experience (F. DeLiddo, personal communication, June 14, 2010).

On June 14, 2010 @1330 hrs Assistant Chief of Operations Black, for the New Haven Fire Department was contacted, but seemed to be pressed for time and only responded briefly to the interview questions. They maintain injury records but would not release that information for undisclosed reasons. Chief Black would not go into details but went on to explain that records would not indicate the presence of one or two chief officers on the scene when a first responder had been injured. Information was also limited on the establishment of a tracking system and the only advice offered was to leave it in the hands of the department safety officer (a chief officer in the PFD) (C. Black, personal communication, June 14, 2010).

The next interview was conducted on 14 June 2010 with Chief O’Halloran of the Boston Fire Department @1500 hrs. The Boston Fire Department like the other departments
interviewed keeps statistics on injuries and have them broken down into different categories primarily type and severity. Although location is usually indicated on the individuals’ personal injury report there is no referral to the number of chief officers on the scene. Once again hard copy request were denied but a copy of standard operating procedure #5 pertaining to operations of a rapid intervention team (RIT) was sent. The information was appreciated but pertains to actions taken after a first responder is injured with no relation to prevention. Chief O’Halloran said the practice of sending two chief officers to an incident was standard procedure prior to his appointment to the department 34 years ago. Chief O’Halloran could not offer any programs or tracking methods other than the fact of safety relations associated with experienced personnel on scene (chief officers) (C. O’Halloran, personal communication, June 14, 2010).

The final phone interview was conducted with Chief Dan Melia of the Fire Department of New York (FDNY) on 30 November 2010 @1130 hrs. Chief Melia is a battalion chief in the safety division and is therefore well versed with factors relating to first responder safety. The FDNY keeps extensive and detailed records of injury types, locations, severity, and number of occurrences. As with the other departments interviewed no injury to chief officers on scene ratio was available. The FDNY always sends more than one chief to a confirmed incident so no documentation was requested. Chief Melia offered, and sent along Chapter five of the Communications Manual dated 4 May 2010 which gives detailed procedures of apparatus and staffing response to various incidents. The document confirms the verbal interview communication that more than one chief officer is used at an incident. There will be no citing of this document due to the fact that the personal interview contains the information about multiple chiefs. No other information was used from this document. Chief Melia stated that the FDNY instituted the policy of at least two chief officers on the scene 15 years ago. He cited safety,
accountability, and span of control issues as the underlying factors for the addition of extra chief officers. His advice was the same as a few of the other interviewed chiefs “do not take the time to conduct a study or trial period, if you have young and inexperienced first responders or new chiefs, get extra command staff on scene as soon as possible. It will only enhance the ability of the IC to better protect on scene personnel from avoidable injury” (D. Melia, personal communication, November 30, 2010)

Members of the PFD were confronted with the issue of having more than one chief on the scene of an incident and how they felt about it, and were asked to identify any benefits. This was accomplished through a voluntary questionnaire, interviews, and personal observations. The voluntary questionnaire was distributed via PFD network email to the company level. At the company level there was the possibility of 120 total responses if there was total participation. The 10 questions asked can be found in Appendix C. Response varied from question to question and also from company to company. The results given will reflect the most common form of response from the majority of participants. Overall all participation ran about 60% mostly due to the fact it was not mandatory and it was perceived as a tool designed to benefit management rather than the study’s real intent which is first responder safety.

Response to Question C1 primarily stated that it depended on who the chief officer was, and was it a chief officer or a captain acting in the capacity of a chief officer. Also, it depends on who the individual company officer is and his or her ability to recognize a situation that is immediately dangerous to life and health (IDLH).

Response to question C2 was pretty much addressed in the response to question C1 with the exception of some companies openly stating that there are individual chief officers, when commanding alone, they would prefer not to work for and have feelings of insecurity.
Response to question C3 was a resounding no with the exception that the fire was being fought from the exterior and there were no exposures. No responders felt safe with one chief while conducting interior operations.

Response to question C4 Once again was a unanimous yes with one exception. Again, the personality and competence issue comes into play creating a small but distinctive void of uncertainty.

Response to question C5 produced two distinct responses. The second chief officer could cover the opposite side of the structure of the initial IC allowing the IC to remain at the command post. Secondly, another chief officer could act as an interior commander that is able to order companies off stairs or to different sections of the building. Currently members of the PFD do not respond well to commands of a company officer, unless they are in the particular company of the officer giving commands. The presence of a chief officer commands the respect and obedience of an order when given face to face, with an added sense of experienced security.

Response to question C6 was almost entirely the same from all participants. The white turnout gear and white helmet are a symbol of command authority and when not assigned or unsure of how to proceed, a company will consult the chief officer. Even though there are two chief officers on the scene, there is only one IC. The IC makes the assignments and decisions, and unless the company officer is paying attention to radio traffic, he or she might mistake who the IC is and have to be redirected from one chief to another.

Response to question C7 was virtually unanimous. In the future members of the PFD will require more supervision due to lack of experience. Less supervision will definitely lead to more injuries and a high probability of a LODD. Even new chief officers will require the supervision of a second chief officer with more command experience.
Response to question C8 was concentrated on the lack of experience and somewhat on the training issues. Many answers claimed that injuries and near misses were attributed certain individuals not knowing what to do (experience & training?) under circumstances that were common place 20 years ago. Very few replied that it was a supervision issue, but the few that did pointed to the fact that increased supervision could overcome lack of experience and training.

Response to question C9 was rather comical but true from many of the members. To reduce injury on the fire ground, do not go into a burning building that even the rats are running out of. Although this would definitely reduce injury this is not always an option as many respondents identified. The most logical responses included additional accountability through increased supervision (know where your members are and what they are doing), and using the span of control module (http://www.fema.gov/emergency/nims/icspopup.htm).

Response to question C10 was answered by the majority stating risk would be assessed by what there is to be gained. High risk to rescue a savable life, moderate risk to save valued property, and no risk to save what is of no value or already deceased. Response to this question also pointed out that many members have trouble equating the risk versus gain module and need supervision to define what level of risk should be employed. Too many chances are being taken to save what is already gone or of no value.

The above questions were answered by multiple members of varying rank within the PFD. In order to gain a complete picture of how members of the department feel about the research project the chief officers setting policy in the administrative offices were interviewed face to face using questions based on their area of expertise (finance, leadership, operations, investigative, safety and training).
The first interview was conducted with the Chief of the Providence Fire Department George Farrell on October 7, 2010. The chief was asked what he thought about the two chief response. From the operational and safety perspective it is a common sense approach hands down. Chief Farrell also went on to explain that due to recent financial issues affecting the department, there were perhaps other ways that the safety issue of first responders could be satisfied and referred this line of questioning to Assistant Chief of Operations Michael Dillon. Chief Farrell further stated that injuries leading to overtime coverage are of considerable concern only superseded by the department’s primary concern for the continued health and safety of first responders. Chief Farrell was receptive to any suggestions that might arise out of this applied research project due to the fact there was little information obtained from members of the RISAFC (G. Farrell, personal communication, October 7, 2010).

On October 1, 2010 Assistant Chief of operations was interviewed and has been a member of the PFD since 1974. There have been three line chiefs since chief Dillon first came on the job and up until about a year ago the only time a second chief was sent to an incident was on the transmission of a second alarm. Previous structure fires were three times more frequent from the late 70’s through 1990 as compared to modern day. Accompanying this was a large base of experience possessed by the majority of the members of the PFD. Many of the members both line officers and firefighters alike hired after the early nineties have very little experience at structure fires due to a 50% reduction in incident type. Chief Dillon stated that the reason only one chief was sent previously, was due to the fact that experienced firefighters and officers were better at conducting risk analysis and hazard identification. A very important piece of information that Chief Dillon incorporated into the interview addressed priorities. In past years it was up to the IC to protect life and civilian property; today’s PFD charges the IC with the...
safety and protection of first responders in addition to the previous responsibilities. “You are asking one chief to do what was a difficult task in the past with experienced personnel, to take on additional burdens with inexperienced personnel without additional command resources.”

According to Chief Dillon today’s PFD injuries are attributed to such factors as lack of situational awareness, physical conditioning, increased personal protection equipment (PPE), and poor risk assessment. Of these four items, three could be improved with additional chief officers on the scene. Chief Dillon is in 100% agreement that the PFD is long overdue in implementing two chiefs per incident policy to reduce injury. In order to indicate the injury trend on the PFD records and an interview with the DIO were made available and conducted (M. Dillon, personal communication, October 1, 2010).

In an interview with the DIO Chief Michael Morgan on 18 Sep 2010 injury statistics were obtained and a comparison was conducted with records acquired from the (FPB). According to Chief Morgan there are no consolidated job wide injury and exposure records available prior to the year 2004 other than in the personal files of individuals which were not available. According to Chief Morgan in 1994 there were 138 overall injuries and exposures, 56 of which occurred on the fire-ground. In the year 1994 there were 356 structure fires in the city that had a response policy of one chief officer to the incident scene.

In the year 2009 there were 196 on the job injuries and exposures overall, 71 of which occurred at the scene of a structure fire. Also, during the year 2009 structure fires declined to 270. Chief Morgan went on to point out, as figures indicate, that while fires decreased, fire-ground injuries increased. While elaborating on injury types, Chief Morgan went on to point out that the majority of the fire-ground injuries were preventable such as hand lacerations because gloves were not worn, burns because members were in the wrong place by their choice, and
smoke inhalation because members were not wearing their self contained breathing apparatus (SCBA). Had there been more direct supervision on the scene Chief Morgan believes many of these injuries and others incurred from elements controlled by members could have been avoided. Injuries broken down by age group show that 20 to 40 year old members have the highest rate of injury on the fire ground when compared to all other age groups responding to fires. Members in the high incidence group were hired after 1990, when the reduction in structure fires began. Chief Morgan brought up the issue of training and experience as possible causes of increased injury coupled with reduced activity (M. Morgan, personal communication, September 18, 2010).

On 22 Sep 2010 an interview was conducted with Battalion Chief James Gallant Director of the (DOT). Chief Gallant pointed out what issues took priority during the training process of a recruit and indicated that most training is directed towards EMS. Extensive training in this area is due to the current trend in the PFD of having to respond to more EMS incidents than fire suppression calls. Chief Gallant produced records to back up his statements. When questioned about fire suppression training chief Gallant went on to state that although there was a component in the training program for firefighting it was very short, providing only one live burn session, and did not provide anything close to what it like to operate at a real structure fire. Chief Gallant went on to say that the actual fire suppression training aspect of a new member, actually takes place under the command of a company officer once the assignment of a trainee is made to a company. Off the record chief Gallant questioned the experience and firefighting knowledge of the officer that the recruit was being assigned to. Referring to the fact of who is ultimately responsible for watching the officer and the recruit at an actual incident, chief Gallant
could not over emphasize the importance of experienced multiple chief officers on the scene (J. Gallant, personal communication, September 22, 2010).

Ground work for the applied research project was laid using personal observations begun in May of 2010 by the author Deputy Assistant Chief (DAC) Timothy McDaniel of the PFD. From May to September observations were made and recorded when time permitted of issues that were addressed by a second chief on the scene that would have otherwise gone unnoticed had there been one chief on the scene. This was made possible by the voluntary response of an additional chief through an agreement made by the chiefs of the working shift amongst themselves. There was and still is no standard operating procedure that directs two chief officers be sent to a structure fire.

Personal observations were made based on question three of the applied research project “What, if any benefits of having more than one chief officer on the scene of an incident do the members of the PFD identify?” By being in the position of the second chief on scene I observed actions taking place that were not in view of the IC, typically the single chief on the scene. No members of the department were aware of my observations and that they would be used in the Applied Research Project (ARP), and therefore had no reason to act differently in the presence of a second chief on the scene. The single most valuable input during the observation were the questions that were asked of me being a chief officer. Questions such as; How ya doin, where do you want us, which way do you think the fire is moving, do you think the building is safe, and have you seen any of my crew just to name a few. Also during my observations, in the best interest of responder safety, tasks were ordered to be stopped and orders were given to complete certain tasks. All observations were completely unbiased toward shift, company, and individual. Observations were based on operational procedure. Any observed procedure that was in direct
violation of PFD SOP were corrected by the author and the responsible party was later consulted as to why the act occurred and how future procedures should be carried out.

All of the below incidents took place in the year 2010. On 5 May at approx. 1000 hrs as a second chief on the opposite side of the building from the IC I observed a ladder company place a ladder upside down to the third floor for ventilation purposes. The ladder will work in this position with just one person on it, had the ladder been used like this to affect a rescue, there is a high probability the ladder would have failed. I later confronted the officer to explain the situation. His response was “I was tied up; you’re the chief you should have told them”. If there was only one chief on the opposite side of the building things could have turned out different.

On 22 May @0130 hrs at a well involved structure fire with a report of occupants trapped, I was approached by an engine company officer and his crew and asked where I wanted them. I informed the officer that I was not the IC and was told they were aware of that, but the IC had them originally standby before my arrival due to the fact he was overwhelmed with radio traffic. During the period prior to my arrival the IC was requesting additional resources when he had unassigned companies ready to deploy immediately. This is a prime example of the IC, and lack of situational awareness. The IC had trouble managing the companies he could see, how could he account for the safety of responders in the building or out of his sight. Neither the IC nor first responders were at fault here, the span of control was overwhelmed immediately. As the second chief officer I assigned the company to search and rescue sector and advised the IC so that he was able to track the company on his matrix.

On 8 June @ 2315 hrs I was at the rear of a commercial structure and saw a hose line leading into what appeared to be an open doorway under heavy smoke conditions with five or six members standing outside not deployed. Wondering why they were not performing a task or
entering the building, I approached and asked what company was inside, and what were the intentions of the members standing outside of a well involved structure fire. I was informed who the company inside was and told by the members outside they could not get through the door even though it was cracked open. Within seconds a mayday was called by the company on the other side of the door that they were trapped with no water. I immediately recognized the problem of the hose line being slid under the door before it was charged; once charged the hose line acted as a door wedge with no water on the fire side. Upon hearing the mayday many members on the outside who did not notice me were extremely confused on what actions to take. Some wanted to run to the other side of the building and inform the IC of the problem while others were trying to get through on their portable radios to shut the line down in order to open the door. After 10 seconds of this inexperienced chaos I simply instructed a member to place his tool in a strategic location between the door and the frame. Following my instructions the door was removed in under five seconds, water was flowing, and the mayday situation was mitigated. What might have happened had I or another experienced chief officer not been on the scene?

On 24 June @ 0100 I was the second chief at a fully involved four story vacant structure where three members had been injured. After the fire was knocked down I spoke with members who were in the vicinity of those who were injured. Eyewitnesses stated that the stairwell leading from the second to the third floor had been highly compromised to extensive fire damage, yet was overloaded by multiple first responders attempting to be the first to the head of the fire. It is apparent that poor risk assessment and lack of situational awareness led to the collapse of the stairs resulting in avoidable injuries to three members of the PFD. Had a second chief officer been on scene acting as interior command she or he would have been looking at the over all picture not just viewing operations as if wearing blinders (lack of situational awareness),
like the members on the stairwell. A second command presence would have immediately cleared up the situation using risk assessment based on previous experience and the ability to see what others had missed.

On 3 July @ 2215 hrs I arrived at a three story occupied wood frame residential structure with heavy involvement at the rear of the structure with all stairwells burned out. The first chief on the scene was busy at the front of the building and I was asked to proceed to the rear of the building and let the IC know what conditions were. Prior to my arrival I heard radio traffic directing companies to the rear of the building to gain entry and advance hose lines to all three floors. When I arrived at the rear of the building I found two engine companies and one ladder company standing outside with a look of confusion on their face. When questioned as to what the delay was I was notified there were no stairs and companies were still being directed to the rear for access. I immediately notified command of the situation (something an experienced company officer would have done), at which time a hazardous notification was put out informing all responders on the scene of a dangerous condition. The IC had no idea of the situation nor was he notified.

On 16 August @ 0230 hrs members responded to a well involve cellar fire. As the second chief I was asked to monitor conditions at the rear of the building where there was a door leading to the interior of the structure along with a small bulkhead that led to the basement. Two safety issues occurred at this incident that could have caused injury had there not been a second chief officer on scene. The first issue involved the non-placement of a second hose line at the top of the basement stairs which according to SOP was immediately ordered to be placed in service by myself. The second issue was more of a life safety issue. The company operating in the basement became disoriented and was running out of air according to their radio
A COMMAND PRESENCE

transmission. Companies operating at the rear of the structure went into the blinder mode and every attempt to reach the company in the basement was geared toward using the basement stairs. Knowing there was a bulkhead to the basement that had gone unnoticed I directed companies to open up and advance an additional hose line. The company in the basement found the bulkhead and exited even before an additional line could be brought in. Experience has taught me to always look for a second means of egress from all situations, especially basement fires.

As a final observation, date unknown, after the extinguishment of a mill fire it was time to shut down a supply line from the fire hydrant to the engine company. With everyone else tied up I requested an individual to perform this task. The member proceeded to the hydrant and began to turn the wrench in an attempt to shut the hydrant off. Only one minor problem as I observed, the member was turning the hydrant wrench the wrong way even though there are clear markings on the top of the hydrant which indicate the open and closed position. While this was not a safety issue at the time, it could have been if this individual was operating the hydrant at the beginning of the incident. I walked over and pointed out the member’s mistake and how to correct the situation. I was thanked and told “we do not do this very much and I was not sure, but thank you for being around to help me” (J. Doe, personal communication, Summer, unknown date).

A chief officer should be multi task oriented, targeting all hazards and possible solutions regarding responder safety. Results indicate that at times, due to span of control, level of experience that responders on scene have, size of the building, and scope of fire conditions that one individual chief officer, even using the ICS can not safely and effectively manage all personnel on the scene. Research has shown that with the exception of a few fire departments,
all departments in this study send at least two chiefs if not more. The primary reason for additional chief officers as indicated in research is to enhance first responder safety, increase accountability, and raise situational awareness.

An analysis of the data found indicates that the hypothesis could not be proven 100% correct due to the lack of any previous studies addressing the subject of the ARP. The PFD along with other departments involved in the study have no record keeping system that could directly tie on scene first responder injuries with the number of chief officers on the fire ground. However, through interviews and personal observations there is clear indication that at certain incidents, the presence of an additional chief officer resulted in injury prevention to first responder.

It was also shown where an advanced level of experience on the scene from multiple members can alter the safety of first responders to a greater degree. In the PFD the experience issue can be directly related to the large number of individuals that have very little fire-ground experience. In addition to the impact an additional command officer has on safety issues, the role and performance of the assigned duties of the safety officer according to the ICS can influence the outcome of an incident (http://www.incosit.org/position/safety%officer.pdf).

Although the hypothesis was not proven, there is every indication from the data collected that those fire departments using more than one chief at the scene of an incident have more control over the incident and a better overall view of what is taking place both inside and outside the structure where the incident is taking place. Given this view, a more informed decision can be made by the IC. Whether that decision will influence first responder safety or not is inconclusive at this time. Results indicate that an experienced well trained IC can take the
additional information provided by the second chief on scene and make an informed decision that could lessen the chances of a first responder being injured due to unsupervised activities.
Discussion

There are no real relationships between this study and any research conducted by an institution or individual other than the fact that first responders sustain injuries on the fireground. Studies have been conducted on types of injuries, mechanisms of injuries, where the injury took place, and what caused the injury. There have also been other studies directed at reducing injuries through various means, but none of which have considered the possibility of an additional chief officer on scene. Perhaps the results of suggested methods from other studies could somehow be incorporated into the second chief officer’s duties with the added degree of experience and observations not made by your typical safety officer.

The closest study in detail to the ARP was conducted by Rand Science and Technology titled “Emergency Responder Injuries and Fatalities” as noted and cited in the literature review section. The Rand study results did not mirror the ARP results but underlying factors such as training, lack of experience and supervision were mentioned. Although the discussion section of the ARP calls for extensive use of related reference materials and they be cited, it is difficult to relate previous works to this study. During an extensive literature review process, studies were found on the duties of an IC (Chief Officer), but nothing that related to the functions or duties of two chief officers on the scene (http://en.wikipedia.org/wiki/incident_commander).

The ARP study has concluded that the overwhelming majority of fire departments send more than one chief to a major incident such as a structure fire, yet has also found that within the literature review conducted, that no study has been conducted relating safety issues to the number of chief officers on the scene. This research project is the product of a fire department that currently sends only one chief officer to a structure fire, and needs to know if, how, and why a second chief is needed. The PFD has a unique problem that needs to be addressed that most
other departments do not have according to the results section. Therefore the limited scope of citable, related material relating to one or two chief officers.

What the study has brought out is the distinct possibility of an enhancement and advancement of required safety procedures on the fire-ground. The on scene safety requirements are the direct responsibility of the IC unless otherwise delegated to a member who is safety officer (SO) qualified, but does not have to be a chief officer. The SO usually attends a course in order to be trained in the duties of the safety sector officer. He or She can be of any rank and is not required to have a certain level of experience.

The author’s interpretations of the results include an increase in safety that is associated with the addition of more than one chief officer on scene. The recognition that the PFD is part of a minority that sends just one chief to a structure fire rather than the additional dispatch of two chief officers indicates a problem. Although no data has been collected that would indicate the rate of injuries with the amount of command staff on scene, personal observations indicate otherwise. What was surprising was the lack of specific record keeping, and the request for said information.

Although the purpose, scope and confidentiality were explained to all participating departments, for some reason or another there were (on the department level) no records of injuries made available. Whether protected by The Health Insurance Portability and Accountability Act (HIPAA) or simply not recorded there was no data available for comparison other than at the federal level which was not broken down enough to be used in the study.

From a personal perspective as an IC it is always a welcome sight to see that second chief officer on the scene. After conducting a rapid 360 degree assessment I position myself at the command post which is usually located at the front of the building or side number one. After
sometimes being flooded with conflicting radio traffic, a transmission from the second chief officer is what I ultimately base my decisions on other than a mayday.

As far as the impact of the study on the PFD it is clear that while the department’s first priority is responder safety, the PFD is behind in its’ method to accomplish this goal in a manner consistent with that of other departments that are similar in size, approximate in location, and a metropolitan department. The PFD is in compliance with the ICS at the federal level which covers the legalities of first responder safety. However, the implications that new and less experienced members are, and will continue to fill the ranks of the PFD, should give notice to the administration of the PFD that the current federally compliant safety program needs to be tailored with tools (additional chief officers) that will allow current operating procedures to supersede existing federal policy in order to offset factors that have the potential to increase injury. In order to add additional chief officers to an incident, qualified personnel must be available on a regular basis (24/7)

Currently the PFD through contract negotiations has agreed to close down the position of one battalion chief. The results of this leaves only two chiefs to cover the entire city and satisfy the requirement of two chiefs on the scene of a major incident or fire. Currently, fire department administrators have not come up with a viable plan for dealing with two incidents at the same time which frequently takes place. The only idea that has been suggested is the use of an additional chief who would be called in from home. With the fire doubling in size every three minutes, the previous suggestion is not only a poorly thought out option, but a gamble with long odds on the lives of first responders.
One other suggestion has been to use captains as ICs but as can be seen in the response by members of the department to the questionnaire, most members feel safer with two chief officers on the scene, let alone a captain with little command experience trying to manage the incident on his own.
**Recommendations**

The results of the study indicate that the PFD should immediately institute a policy that directs the dispatch of two chief officers to a report of a structure fire or an actual structure fire itself. Although there are multiple reasons for this, of most importance is the protection and safety of the first responder. Along with the practice of sending two chiefs to the scene of a major incident, policy must be set and made available to all members of the department in order to insure operational uniformity. The response of two chiefs should not be on a trial basis but rather a permanent one, policy and operational procedures should be on a trial basis to allow for optimum use of the second chief. Adjustments to procedures should be based on first responder injury occurrence, property loss, and availability of chief officers. The above recommendations are made on the basis of information contained in the results section that show even with a reduction in structure fires, there continues to be an increase in fire-ground injuries.

In order to obtain data on the effectiveness of a second chief officer a data base will need to be set up addressing multiple specific issues. The reason for the detailed record keeping goes back to the issue in the literature review. Very little information was available to use as a starting point for anyone wishing to conduct a study related to the ARP topic. Aside from the benefit the study offers the PFD, it is hoped that in the future, anyone wishing to further the study will have a solid base of information to work from, along with the problems and limitations that were encountered.

With the recommended changes in place there should be two major noticeable changes. First there should be a reduction in first responder and civilian injury alike. Both in severity and the number of occurrences. Secondly, the experience and knowledge of the additional chief
officer on the scene can be passed along to the younger less experienced members during the incident where immediate action is not a factor and a review after the incident is declared under control. These two benefits, in the long run, can result in substantial financial savings associated with medical costs and the overtime used to fill the injured member’s position.

It is recommended that the third line chief that was eliminated be reactivated immediately in order to have an additional chief available should the other two be tied up at a fire or other major incident. All line chiefs should receive additional training once procedures have been finalized in order to understand the role of the second chief on scene. Besides the three proposed working chiefs it would be of great value to have three or more chiefs on the scene of an incident. If two chiefs operating at an incident increase hazard identification and injury reduction during the trial period along with gaining the confidence of PFD members, imagine the possibility of three or more chief officers monitoring fire-ground operations. The PFD will not only meet federal mandates but will surpass them both on paper and in the street. This however is a wish list, and given the financial status of the city, not a likely scenario. There are other options, but none meeting the standards the addition of chief officers would attain.

In order not to be biased towards recommendations, and the addition of a chief officer as the only solution to the problem, some suggestions should be offered using the resources on hand. One possibility, although not explored in the study would be the use of multiple safety officers from the company level at an incident in order to “surround and drown with knowledge and experience” rather than rely on qualifications from one individual chief officer. Another possibility would be to make use of chief officers from other surrounding cities when the work load become too much for the on duty chiefs of the PFD.
No matter how smart or experienced an IC is there is many times that even when the span of control is not exceeded, the IC will have a better handle on the situation given the feedback of an additional chief. Many practices and procedures are in place to protect the first responder, but after conducting the study it appears that other departments and recommendations from the NFPA rely upon experience, knowledge, and training. Where better to find all of these traits in one place than in a chief officer.
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Appendix B

B1. How many currently respond on a first alarm of a confirmed structure fire or incident of similar significance?

B2. If a second chief officer is dispatched, what is his or her primary responsibility and where are they located on the incident scene?

B3. Where does the second chief officer fit into the ICS?

B4. Are there any local, state, or federal codes used by your department that address firefighter safety while operating at the scene of an incident?

B5. What, if any safety factors for first responders have been identified using one or two chief officers on the scene of an incident?

B6. What, if any benefits of having more than one chief officer on the scene of an incident have members of your department identified?

B7. Has the practice of an additional chief officer at the scene of an incident increased first responder safety from the command and control perspective?

B8. What policies and procedures were used to develop and implement the use of a second chief officer at the scene of an incident?

B9. Has the addition of a second chief officer had any negative effects on operations or communications within the command structure?

B10. If your department currently sends one chief to a single alarm structure fire; Have you ever considered using two chief officers, and for what reason?
Appendix C

C1. Do you currently feel safe while operating at a structure fire or an incident of similar size under the supervision of one chief officer?

C2. Do you feel more comfortable knowing which chief officer is supervising the incident?

C3. Is one chief officer enough to properly command an incident such as a fire in a well involved three story wood frame residential structure?

C4. Would you feel more comfortable (safety oriented) with a second chief officer on scene given the above scenario?

C5. Identify any benefits of having a second chief officer on the fire-ground.

C6. Identify any disadvantages of having a second chief officer on the fire-ground.

C7. Do you feel that currently, and in the future members of the PFD will require more or less supervision at the scene of a structure fire or other major hazardous incident?

C8. If first responders are being injured or having near misses at structure fires are there issues with equipment, training, experience, supervision, or any other factors?

C9. In your opinion are there any ways of reducing injury to first responders at the scene of a residential structure fire.

C10. What has the greatest influence on the risks and actions you will perform at a structure fire?