Identifying Essential Elements of Near Miss Reporting for the Stockton Fire Department

Matthew Duaime

Stockton Fire Department, Stockton, California

Certification Statement

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

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Matthew J. Duaime

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Abstract

The problem was that the Stockton Fire Department (SFD) would routinely become aware of the near miss situations and/or injuries involving fire department employees; occasionally these situations would also involve other city department employees. The information regarding these events would be discussed informally; however, there was no systematic internal process to collect information and analyze the chain of events and modifying conditions that led up to the near miss situation or injury. The purpose of this applied research project is to understand: (a) What are the employers' legal requirements for reporting? (b) What are the existing high performing near miss reporting models? (c) What components are needed to develop an internal near miss reporting process? (d) What are the relevant tools to measure reporting effectiveness? The descriptive research process included a literature review to design a near miss reporting system that takes basic foundational components from recognized systems and adapts those components to the reporting needs of the SFD. This research included analysis of private industry reporting processes as well as the existing national reporting system. In the U.S one firefighter is injured every eight minutes and approximately 100 firefighter fatalities are reported annually. This research project studied accepted national data and injury statistics, developed basic internal SFD measurement tools and combined those with numerous inputs from safety professionals to form a basis for the SFD near miss reporting model. Based on the results of this research, the recommendations include: implement a two-tier near miss reporting system, design a comprehensive risk management plan, create an incentive-based reporting system, and develop a comprehensive data analysis system for evaluating near miss events and occupational injuries. Future researchers should review limitations of this project and focus on understanding and studying the human factors and reporting obstacles associated with near miss events.

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Introduction

The Stockton Fire Department (SFD) is a department that values customer service and traditional firefighting to the highest professional level possible. The SFD's motto is: "Community Service with Excellence" (Stockton Fire Department [SFD] website. n.d.). Previously an Insurance Service Office "ISO Class 1" Fire Department for thirty-seven years, SFD's mission has centered on being known as an aggressive interior attack fire department. This aggressive modality applies to all aspects for emergency service delivery and has become the key element of a proud tradition based culture. Additionally, the SFD genuinely values the safety of their membership and the importance of their well-being as has been declared in the SFD's core values statement: "Importance of our members - We value the wellness and safety of each individual." (SFD website. n.d.).

The SFD Fire Chief created an Occupational Health and Safety Division (OHS) in September of 2014 and is currently staffed with one full time member. The OHS program charter and work scope of this division is to oversee different safety-related committees that deal directly with work place safety and employee wellness, both physical and mental. Different sub groups within the OHS division include the safety committee, vehicle accident committee, wellness program, facilities inspection program and Cal/OSHA citation/regulatory compliance program.

The SFD has developed a peer based safety committee. The Stockton Fire Department Safety Committee (SFDSC) is comprised of 27 members from various ranks and includes both fire administration and fire suppression work groups. The committee has been officially

sanctioned by the Fire Chief's office for 22 months. The motto and mission of the safety committees is:

Motto:

"The Importance of Employees and Their Safety"

Mission:

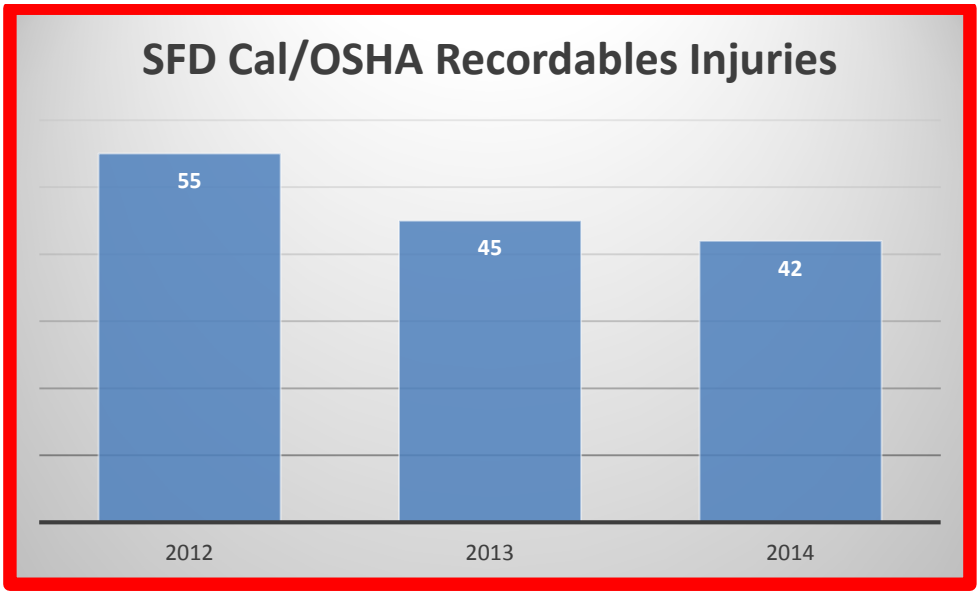
"This Committee (SFDSC) uses progressive methods and best practices to identify and validate safety concerns and issues affecting the safety of our employees. We enhance workplace safety by raising situational awareness and offering unparalleled education, training, and equipment that focuses on the health and well being of our employees. These elements are the foundation of a world-class safety culture." (SFDSC, 2014).

The SFDSC is a subcommittee of a larger safety and risk reduction management group within the City of Stockton. The City of Stockton has defined 13 departments with a safety representative from each department. The City of Stockton's risk management safety committee is designed to coordinate risk reduction and to implement best safe work practices in a standardized manner throughout the City. This process is overseen by a risk management director who provides direction and comparative information for the departments to utilize. This risk management safety group meets on a monthly basis to discuss and communicate needs, identify injury trends, anticipate regulatory changes and help develop proactive safe work practices and programs.

The SFDSC meets on a monthly basis as well to discuss a myriad of topics, including the latest high risk low frequency responses, recent accidents and injuries, operational changes and

proactive preventative risk reduction concept programs (SFDSC, 2014). The near miss reporting process is recognized in concept; however, there is no formalized process for employee reporting or for collecting reports and analyzing data.

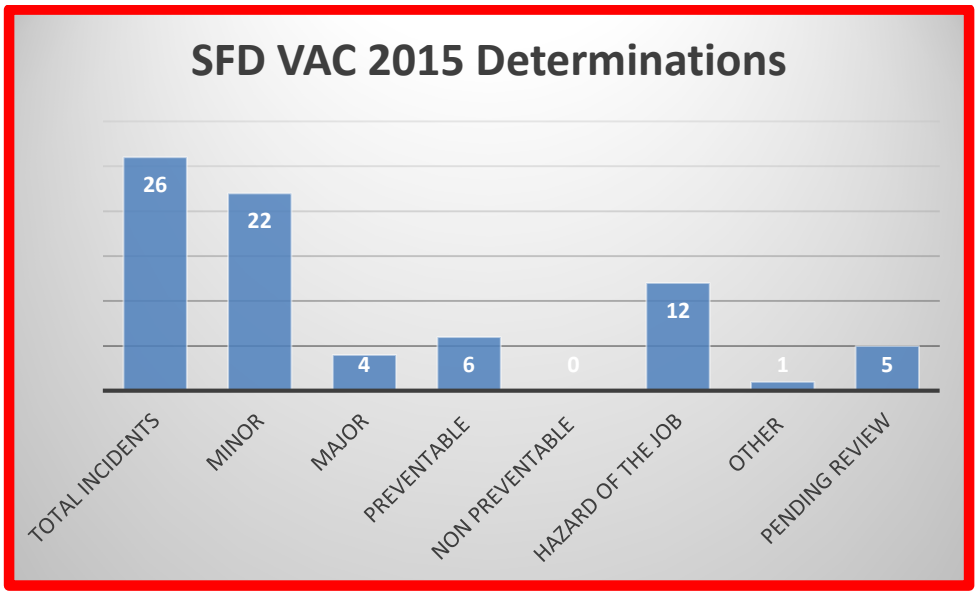
The concept of firefighter safety is embraced within the SFD. Most of the department is all too familiar with a tragic incident that occurred on February 6, 1997. The SFD lost 2 firefighters and critically injured a third in a heroic rescue effort of a senior citizen who was trapped in a two-story residential house fire. This incident, known as "26 W Mendocino," was investigated by a Board of Inquiry (BOI) and National Institute for Occupational Safety and Health (NIOSH). The SFD has lost 12 firefighters since its inception over 166 years ago in 1850.



From 2012-2014 the SFD has averaged 47.3 Cal/OSHA recordable injuries. The number of injuries declined in 2014; however, it's too early to tell if this is a continuing trend. Recent

recordable injury totals for 2015 include 44. Additionally, the SFD averages 55 reportable first-aid type injuries per year (SFDSC, 2014). The problem is that key components for a near miss reporting system have not been developed for the Stockton Fire Department.

The Vehicle Accident Committee (VAC) is a subcommittee of the SFDSC and was formed 11 years ago. It is a peer-based accident review committee. The VAC reviews **all** incidents involving vehicle damage from minor scratches to major vehicle collisions. In 2015 the VAC reviewed 25 vehicle related incidents of which seven were found to be preventable.



When vehicle incidents are determined to be preventable, the VAC is the recommending body for re-training and progressive discipline relevant to incident circumstances. This findings recommendation is forwarded to the Deputy Fire Chief of Operations for consideration.

The purpose of this project is to provide a foundation for a near miss reporting system by using descriptive research to identify key system components and to understand the critical process elements of a near miss reporting program. This Applied Research Project (ARP)

focused on the four following areas to form a recommended near miss reporting model: (a) What are the national and California regulatory requirements for reporting near miss events in the workplace? (b) What are examples of national best practice models for near miss reporting? (c) What are the essential components needed for the SFD near miss reporting? (d) What internal means are needed to collect and analyze data for effective reporting?

Background and Significance

The SFD covers over 91 square miles of jurisdictional response area and serves a population of 355,000 residents with 12 Fire Stations. Each day the city and the surrounding metro area is protected by 15 fire suppression response units which are staffed with 12 three-person engine companies and three four-person truck companies with a daily staffing of 51 personnel. The 15 fire units and personnel are commanded by two on-duty battalion chiefs, and a chief's operator (SFD website. n.d.). The City of Stockton is the county seat for San Joaquin County and is centrally located in the San Joaquin Valley; located about 45 miles south of Sacramento, the State Capitol of California.

The SFD is staffed with 209 persons including all support staff. Each day 51 SFD personnel protect the community and contract districts from both structural and urban interface fires, hazardous materials, technical rescues, and dive and surface water rescue, as well as support law enforcement with a tactical paramedic program. Since 1976 the SFD had provided and continues to provide ALS non–transport services. Each fire engine is staffed with dual paramedics to assist private transport ambulances with advanced life giving care.

San Joaquin County is comprised of 19 different fire agencies including the City of Stockton. The SFD has contracted with four county fire agencies since the early 1980's and

averages 38,000 calls for service annually. Call distribution is typical with 83% of call volume EMS based and the balance ranging from fires to good intent calls for service. In 2014 the SFD responded to 391 structure fires, 204 of which were considered working fires.

In July 2012 the City of Stockton filed for municipal bankruptcy. Stockton was the second municipality in California to make this declaration. One year prior on July 1, 2011 the SFD experienced a significant staffing cut ordered by the City Manager. The SFD closed one fire house with an engine company, one truck company, reduced all four-person fire engines to three- person and all trucks were reduced from five to four person. This resulted in 36 firefighter layoffs. Average time on job for the laid off employees was six years of service. The previous daily staffing prior to July 2011 was 75 firefighters per shift. The SFD has absorbed the work load that this 32% staffing reduction caused. The SFD members work a 48/96 shift schedule with no max days worked cap. Prior to December 2015 the youngest member of the department was 30 years of age. Currently the average age of a SFD member is 43 years.

The SFD annually averages 46 Cal/OSHA recordable injuries over the past three years. A simple average calculation method shows that the SFD averages one firefighter fatality every 12.25 years. Another less significant nonetheless important impact is fiscal; the average cost of one worker compensation injury within the City of Stockton is $11,800-$13,250. This figure includes direct cost associated with the injury, i.e., medical treatment, rehabilitation and wage compensation. This does not include any indirect administrative cost such as worker compensation rate adjustments, administrative time and various other factors. It has been a widely accepted principle by risk management that the indirect cost of a work-related injury can range from 10 to 15 times more than the direct cost (SFDSC, 2014).

This research project relates directly to the United States Fire Administration's strategic objective: "Goal Number 1: Reduce Risk at the Local Level through Prevention and Mitigation." This paper utilizes a descriptive research method to examine which model and best practices should be used by the SFD to develop and implement a near miss reporting system.

Literature Review

A literature review was conducted to identify, understand and examine the employer's legal requirements to develop near miss reporting processes, mitigate the hazards surrounding the near miss events, and communicate known hazards throughout department communication channels. Both public and private employers operating in the State of California are regulated by the California Department of Industrial Relations (DIR) also known as Cal/OSHA. Cal/OSHA is a subordinate agency to Federal OSHA. The relationship between the two agencies exists as such: Cal/OSHA is required to enforce Federal OSHA regulations at an equal or more stringent regulatory standard (Department of Industrial Relations [Cal/OSHA], May 2011). This model is known as a state planned state as it relates to governance of worker safety regulations. Many public agency employers fall under the General Industry Safety Orders (GISO) category for workplace safety. This work force categorization is determined by Federal OSHA, Cal/OSHA and the Bureau of Labor Statistics (BLS). The GISO categorization obligates the employer to follow general industry safety orders as outlined by Federal and Cal/OSHA regulations. Specifically this applies to the City of Stockton Fire Department. Contained within those general industry safety orders are the legal requirements to follow Title 8 Section 3203 Injury Illness and Prevention Program (IIPP). This program standard became effective July 1, 1991. The SFD has

had an IIPP since 1993 and it has been updated in 2002 and in 2015 (Department of Industrial Relations [Cal/OSHA], 1991).

The employer's IIPP regulatory authority comes from Cal/OSHA which states:

> In California every employer is required by law (Labor Code Section) to provide a safe and healthful workplace for his/her employees. Title 8 (T8), of the California Code of Regulations (CCR), requires every California employer to have an effective Injury and Illness Prevention Program in writing that must be in accord with T8 CCR Section 3203 of the General Industry Safety Orders. (Department of Industrial Relations [Cal/OSHA], 1991).

This regulatory language is very specific to the responsibilities of the employer to create and maintain safe workplace operations. The regulation requires that the employer identify a person or persons that have been charged with the oversight responsibility for implementing an IIPP. This program must ensure that employees comply with safe work practices and ensure substantial compliance (Cal/OSHA, 1991, p. 1).

CCR Title 8 Section 3202 identifies this person as a health and safety officer for the organization. The responsibility of the IIPP resides with the owner of the company, department head or director of a governmental agency. The employer is allowed to designate the position of the health and safety officer (HSO) to a responsible and competent employee for the purpose of administering all aspects of the IIPP (Cal/OSHA, 1991, p. 1).

The HSO is required to ensure that employees follow safe and healthful work practices and conduct re-training programs if required. This person also has responsibility and decision-making authority, including the ability to issue "stop work authority", implement corrective

measures and recommend disciplinary actions as a means to ensure compliance with the IIPP (Cal/OSHA, 1991, p. 2).

The HSO is also required to include an effective system for communicating to employees in a form readily understandable by all, including those with language barriers on matters relating to Occupational Health & Safety. The system must be designed to encourage the employees to inform the employer of recognized hazards that exist on the worksite without fear of reprisal. Examples of an effective communication system include regular meetings, training and retraining programs, written communications, a system of anonymous notifications by employees about hazards, labor management safety and health committees, and any other means that allow useful communications with employees (Cal/OSHA,1991, p. 2; Cal/OSHA, May 2011). Under CCR 3203 the HSO is required to include processes for identifying, investigating and evaluating hazards that exist in the workplace. This person is charged with conducting regular inspections of the work place and conducting audits of workplace safety programs (Cal/OSHA, 1991, p. 2).

The employer or designee may elect to use a labor-management safety and health committee. If so the HSO is required to comply with communication requirements including meeting regularly, but not less than quarterly, prepare and make available for affected employees written records and safety and health recorded meeting notes, relevant safety issues and meeting notes discussed at committee meetings. Moreover, these records and notes must be made available to the employees for a minimum of one year (Cal/OSHA, 1991, p. 2).

A required function of the safety committee includes a review of results of periodically scheduled worksite inspections and discussions, including hazards found and mitigating

measures that enhance workplace safety. The HSO and the committee are also charged with review of investigations of occupational accidents and the causes of those accidents that result in occupational injury or illness, including exposure. When appropriate the committee will also submit recommendations to management for further prevention of such injuries (Cal/OSHA, 1991, p. 2; Cal/OSHA, May 2011).

When required the committee shall investigate alleged hazardous conditions brought to the attention of any committee member and when deemed necessary, the committee may conduct its own inspection and investigation that would assist the employer in mitigating solutions. The HSO and the committee are also charged with the responsibility of ensuring that the employer has mitigated identified citations that have been issued by Cal/OSHA. The committee and HSO are responsible to ensure that mitigations remain in place and are effective (Cal/OSHA, 1991, p. 3; Cal/OSHA, May 2011).

The HSO is considered to be the architect for the safety system in place within the workplace. This safety management system is designed to identify patterns and trends within the operations that allow the employer to implement predictable results (National Safety Council, 2001, p. 167).

Absolute safety is not a cost-effective model for high risk employers. For most fire departments to achieve a no risk status would be impossible and would result in essentially no emergency response. People have inherently accepted risk within any venture and understanding those risk hazards becomes tolerable to the workforce (National Safety Council, 2001 p.169).

The HSO and the committee are charged with identifying hazards within the workplace. Fire departments innately deal with many hazards in a dynamic and rapidly changing emergency

environment. Fire department employees accept those risks until they become intolerable (Dodson, 2007). Hazard analysis within the fire department is often difficult because the ability to identify and evaluate or duplicate exactly the same hazards for the purpose of elimination is a challenge because limited data exists to support that analysis. Many times situations encountered in emergency response have similarities, but rarely are they identical as compared to industrial manufacturing settings. The simple lack of empirical data and the ability to re-create close calls or mishaps has caused many fire departments to accept these situations as a part of department operations (Dodson, 2007).

Analyzing situations and problem solving is not a new process. Workers constantly make assessments to evaluate and guide their decisions for actions within the workplace. Many times those workflow paths are never identified in a formal manner but rather become habit from years of on-the-job training (National Safety Council, 2001 p. 169). Part of a hazard analysis must take into account the factors that need to be analyzed in association with the work being performed. In a perfect world every fire department job task would have a hazard analysis in determining a priority rating that should take the following factors into consideration (National Safety Council, 2001 p. 170).

- "Frequency of the incident: any operation or task with a historical account of repeated incidents should be considered. This should be cross-referenced with other employers engaging in similar type activities." (National Safety Council, 2001 p. 170).
- "Potential for injury: some processes and operations have a low frequency of occurrence however the highest potential for major injury." (National Safety Council, 2001 p. 170).

- "Severity of the entry: any job-related task or process that has been identified by the employer historically known to produce serious injury is worth conducting a hazard analysis even if the frequency is considered low." (National Safety Council, 2001 p. 170).

The HSO is responsible for assessing this hazard analysis and prioritizing in a systematic way to develop a safety system that lessens the potential risk of exposure injury to the employees. When the HSO becomes aware of a new or unrecognized hazard, he is obligated under CCR 3203 to make a decision for corrective measures (Cal/OSHA,1991, p. 2). These unsafe conditions must be corrected in a timely manner using the following procedures:

- At the time observed or discovered that a confirmed hazard exists which cannot be immediately mitigated without endangering employee and/or property, the employer will remove all workers until the hazardous conditions are mitigated or proper and necessary protection has been provided to the employee. Actions taken and the dates they are completed must be documented within the organization (Department of Industrial Relations [Cal/OSHA], n.d., p. 18)
- The employer is required during the hazard assessment and correction process to properly document the person conducting the inspection, the hazardous condition or work practice that existed, and the corrective actions taken to mitigate the circumstances (Department of Industrial Relations [Cal/OSHA], n.d., p. 18).

The information below represents a small portion of the SFD's injury illness prevention program. Two key points are outlined in this excerpt, including the internal regulatory authority for the Fire Chief and supervisors to manage the employees' safe work area. The second element explains the responsibility of all employees to notify and when appropriate and/or mitigate

known safety hazards in the workplace. These four paragraphs are taken directly from the SFD's Injury and Illness Prevention Program - IIPP 2015 (SFD, 2015, p. 5-6).

The Fire Chief, Chief Officers, Captains, Managers and Supervisors are responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees and to enforce the rules fairly and uniformly (SFD, 2015, p. 5-6). Those safety and health policies and procedures include, but may not be limited to, the following:

- OSHA and Cal/OSHA safety regulations
- All Safety Directives
- All local work rules intended to prevent job injuries and illnesses

Every employee, regardless of job title, level, or areas or responsibility, is responsible for personal compliance with all safety and health policies and procedures, including, but not limited to, the following:

- OSHA and Cal/OSHA safety regulations
- All Safety Directives
- All local work rules intended to prevent job injuries and illnesses

Noncompliance with any provision of this IIPP may subject the Fire Chief, Chief Officers, Managers, Supervisors or employee to disciplinary action**.** All employees shall be evaluated regarding compliance with safe work practices in their biennial performance appraisals. (SFD, 2015, pp. 8-9)

Employees shall immediately report all recognized or potential safety hazards to their supervisor. The supervisor will initiate corrective action to address hazards and/or unsafe work practices as soon as they are identified and as quickly as it is safe to do so. Priorities will be determined by the severity of the hazard(s) as detailed in the Hazard Identification, Assessment, and Correction Safety Directive.

Actions to be taken following the discovery of a safety hazard may include implementing safer procedures, installing guards, modifying equipment, training employees, or any other actions that will provide the highest degree of safety until the hazard is abated (e.g., engineering and/or administrative controls). If not immediately corrected, a target date for correction will be established based on the severity of the hazard. (SFD, 2015, pp. 8-9)

National Fire Protection Associations (NFPA) 1500 Standard on Fire Department Occupational Safety and Health Program 2013 Edition addresses the health and safety officer directly about risk management and hazard assessment (NFPA 2013). The main body of NFPA 1500 does not specifically address near miss reporting; however, Annex D references risk management plan factors and it states:

> Annex D recommends fire departments create "a risk management plan that serves as documentation that risks have been identified and evaluated and that a reasonable control plan has been implemented and followed". (NFPA 2013 Annex D 1).

The fire department's HSO develops this risk management plan. NFPA 1500 specifically identifies six factors that should be included in this planning process. Those factors include:

- Risk Identification - Identify every aspect of the operation of the fire department with potential problems. The following are examples of sources of information that could be useful in this process:
    1. A list of risks which members can or are exposed to;
    2. Records of previous accidents, illness and injuries, both locally and nationally;
    3. Facility and apparatus surveys, inspections, etc. (NFPA 2013 Annex D 1.2).
- Risk evaluation - Evaluate each item listed in the identification process using the two following questions:
    1. What is the potential frequency of occurrence;
    2. What is the potential severity and expense of each occurrence (NFPA 2013 Annex D 1.2).
- Establishment of Priorities for Actions - Determining the frequency and severity of occurrence of all risks will serve as a method for establishing priorities; any risk that has low probability of occurrence and will have serious consequences; considered a high priority item; non serious incidents with low likelihood of occurrence or lower priority and can be placed on the bottom of the action required list (NFPA 2013 Annex D 1.3).
- Risk Control - Once a risk is identified and evaluated, a control for each should be implemented and documented; two primary methods of controlling risk and/or preference are as follows:
    1. Whenever possible totally eliminate and avoid risk or the activity that presents the risk (NFPA 2013 Annex D 1.3).
    2. Where it is not possible or practical to avoid or eliminate risk, steps should be taken to control it (NFPA 2013 Annex D 1.4).

- Other methods of control to be considered are the following:
    1. Safety program development, implementation and enforcement;
    2. Standard operating procedures, development dissemination and enforcement;
    3. Training;
    4. Inspections (NFPA 2013 Annex D 1.5).
- Risk Management Monitoring and Follow-up - As with any program, it is important to evaluate whether the plan is working. Periodic evaluation should be conducted and if the program elements are not working satisfactorily, then modifications should be made (NFPA 2013 Annex D 1.6).

A summary in NFPA 1250 2010 edition specifically states in Chapter 5 that a risk assessment should be conducted for the purpose of identifying and analyzing risk by the fire and emergency service organization for those individuals for whom they are responsible and also to whom they are accountable (NFPA 2010 p. 5.1). Chapter 5 goes on to indicate that a risk assessment should consist of risk identification and comprehensive analysis, and should establish a priorities list for action. This action list should be risk ranked in order of highest frequency and severity to ascertain the most systematic way to implement risk reduction (NFPA 2010 p. 5.1).

The fire department's risk reduction plan should include a regular review on a scheduled basis to evaluate operational and organizational changes that have occurred in an indicated amount of time. NFPA 1250 also states that post-incident analysis should be included in this evaluation because many times it identifies trends or noticeable gaps within the organization's risk profile (NFPA 2010 p. 5.1.3).

The NFPA's standards handbook gives a very detailed explanation and interpretation of NFPA 1500 and 1521 by specifically addressing the role of the department's HSO as it relates to the organizational relationship and responsibility of the Fire Chief's office (Foley, 1998). The Fire Chief's office is ultimately responsible for development, implementation and management of the employees' occupational health and safety programs. In practice the day-to-day operational responsibility of occupational safety and health is delegated to the HSO (Foley, 1998, p. 111).

Chapter 2 of NFPA 1521 specifies the qualifications necessary for a competent HSO. As a basis for training the NFPA standards handbook recommends a 16-hour training course for the National Fire Academy's HSO (Foley, 1998, p. 112). Moreover the Standards handbook suggests that an effective HSO should serve both as a firefighter and as a fire officer in order to gain the experience necessary to have an enhanced understanding of occupational safety hazards. One of the best tools available to the HSO to evaluate organizational risk includes live fire training in a controlled learning environment, also known as a directed exercise. Live fire training gives the safety officer the ability to assess operational risk and hazard potentials (Foley, 1998, p. 113).

Additional qualifications outlined include nontraditional learning environments such as college and university safety programs that have been developed by safety professionals over the last 40 years. One specific professional association recommended is the American Society of Safety Engineers (ASSE) as a professional development tract (Foley, 1998, p. 113). Finally, HSO authority comes directly from the fire chief. The fire chief must grant the HSO the ability to immediately correct hazards that jeopardize the safety of department employees. NFPA 1521 identifies three types of hazards: nonemergency, imminent dangers, and long-term non-

imminent dangers. The HSO must address and eliminate identified imminent hazards with the authority granted in this position (Foley, 1998, p. 114).

The role of the NFPA standard-setting committee is considered to be an assembly of subject matter experts with a comprehensive understanding of the above topics. Although the NFPA has no regulatory authority, these committees are often considered examples of best practices standard-setting committees. Fire departments nationally are not obligated to follow NFPA; however, in the unfortunate event of a significant injury or fatality, NFPA is referenced in the OSHA citation process, as well as the legal proceeding.

Many agencies have incorporated incident safety officers and health safety officers to have a good opportunity to observe trends within the organization. Spotting is an opportunity for leaders and safety personnel to recognize gaps within an organization that create near miss events. Many times the professional expertise of a safety officer not only allows him to identify the problem, but also to present reasonable solutions (Dodson, 2007, p. 308).

The NFPA reports that firefighter injuries were down in 2014. This is a decrease of 4% from the previous year. NFPA noted the progress as part of the annual report on firefighter injuries in the United States. The number of firefighter injuries reported in 2014 was 63,350, which marked a 3% drop from the previous year. Despite a decrease in reported injuries they remain a common threat for firefighters. The NFPA estimated that one firefighter is injured every eight minutes on average in the United States (Safety and Health, January 2016, p. 37).

Firefighter injuries were categorized into five distinct sections:

- Fire ground operations 43%
- Non-fire related incidents 23%
- Other on-duty activities 17%
- Training 11%
- Responding to and returning from 6%

The most common type of injury on fire ground operations were sprains, strains and muscular pains at 52.6 %; the second most common injury was lacerations at 13.6 %, bleeding, bruising, smoke and gas inhalation at 6.4% (Safety and Health January 2016 p. 37). The relationship between unsafe actions and actual harm can be illustrated by the safety pyramid. This pyramid shows that for every worker fatality, there will be 10,000 unsafe acts. The fire service has learned from the aviation industry that reporting a near miss event that could have led to an injury results in fewer injuries, accidents and errors because the data sets are analyzed and acted upon. In other words the reduction in injuries, accidents, and errors drives down the fatality rate also. Near Miss Reporting (NMR) concentrates on unsafe acts and property damage data of the pyramid because this data offers more opportunities to learn and prevent (NFFNMRS, 2009, p. 7).

Close calls and near misses need to be investigated. These terms are interchangeable; whether a near miss or a near hit, evaluating and analyzing these events may prevent future injuries. A near miss in an organization should be considered a gift of opportunity by the safety leadership to analyze, determine cause, and mitigate to resolve future injury. Unfortunately, many times the interpretation of a close call is subjective and generally deemed unintentional;

however, with a certain minimal alignment that same event chain link could create an injury, fatality, property damage or environmental impact. Fortunately for the agency a break in the chain of events prevented this undesired outcome (Dodson, 2007, p. 309).

The purpose of near miss incident reporting is to reduce reoccurrence by gathering timely information in a systematic, complete, accurate and objective manner. The goal is to gather data that will allow the employer to arrive at causal factors and root causes for the incident. The data will be examined and analyzed to identify corrective measures and process improvements which will be developed and implemented as means of significantly preventing future reoccurrence of damage to property and risk of fiscal losses. To fully understand the purpose of a near miss reporting system certain terminology must be understood:

Accident - an undesired event that results in personal injury or property damage (National Safety Council, 2001).

Incident - an unplanned or undesired event that results in loss or under slightly different circumstances could have resulted in a loss. Example of incidents include fatalities, lost time injuries, injuries requiring first-aid, environmental release into the air or ground, exposure to hazardous materials (toxic, corrosive or flammable) flammable explosion or motor vehicle accident, near miss, unplanned shutdown, damage to property or equipment. No distinction is made between incidents that have serious consequences and those that have no serious consequences (Cal/OSHA).

Near accident or near miss is an example of an incident resulting in neither injury nor property damage. However, a near accident has the potential to inflict injury or property damage if the cause is not corrected. About 75% of industrial injuries are forecasted by accidents or near

misses. It is in the supervisor's best interest to find and eliminate the causes of these near misses to prevent them from reoccurring or becoming a serious accident (National Safety Council, 2001, p. 3).

Near miss - any incident that does not result in injury, death or damage or damage to the property or environment, but could have been given slightly different circumstances. Near misses are also known as near hit, close call, or mishaps. Near misses can simply be called "close calls" and if they are not attended to and corrected they will most likely cause injury to one or more employees or cause illness from the original incident (NFFNMRS, 2009, p. 7).

Risk - a measure of combined probability and severity of potential harm to one or more resources as a consequence of exposure to one or more hazards. Mathematically speaking, risk is a simple product of severity and probability that one or more hazards will impose upon one or more resources (Lack, 2001, p. 89).

Risk acceptance - the acceptance by an individual or organization of a level or degree of risk that has been identified as a potential consequence of a given course of action (Lack, 2001, p. 89).

Risk assessment - the process of determining the degree of threat that is posed by one or more hazards to one or more resources or the product of that process; risk can be assessed either subjectively or numerically (Lack, 2001, p. 89).

Risk control - the process of minimizing accidental loss by anticipating and preventing the occurrence of unplanned events; in the broadest form risk control incorporates a wide range of elements, including worker safety and health, environmental affairs, property conservation, fire protection, security transit product safety, third-party liability and contractual liability (Lack, 2001, p. 89).

Risk management - the professional assessment of all loss potentials within the organization's structure and operations leading to the establishment and administration of a comprehensive loss control program. Related to and independent upon an ongoing program of accident prevention, risk management encompasses a selection of purchase insurance, health insurance, and assumed risk with a goal to reduce losses to an acceptable minimal at the lowest possible cost (Lack, 2001, p. 89).

Risk (calculated) - an action undertaken or expected to achieve a particular purpose after the probable consequences have been eliminated; calculated risk, sometimes called residual risk, is risk charged to be acceptable through consideration of a planned operation (Lack, 2001, p. 89).

Unsafe act - any behavioral departure from accepted or correct procedure or practice which in the past has produced injury or property damage or which has the potential for doing so in the future and unnecessary exposure to a hazard conduct that reduces the degree of safety normally present in an activity (Lack, 2001, p. 108).

Unsafe condition - a condition in the work place that is likely to cause property damage or injury. Examples of unsafe conditions include: defective tools, equipment, or supplies, inadequate supports or guards, congestion in the workplace, inadequate warning systems, fire and explosion hazards, poor housekeeping, hazardous atmospheric condition, excessive noise and poor ventilation (Lack, 2001, p. 108).

This abbreviated common terminology list for NMR gives a basic overview of definitions that will assist individuals within the fire department in developing the NMR process.

In the NMR process it has been noted that seven key areas exist in developing an effective system. The process outlined below presupposes that all individuals in the organization

understand the described terminology above as it relates to near miss events. It assumes that a normal program implementation would include a training program and would have identified the process key elements and case history within the organization to which the employees can relate.

- **Unsafe act or condition and hazard awareness**

In a NMR system all employees have to be acutely aware of potential hazards. Furthermore, they have to understand consequences of actions that are outside of safe work practices. In many different industry settings the question is raised: What percentages of near misses are actually reported? The National Safety Council reports that it is likely that less than 20% of near miss incidents are actually reported (Balge & Krieger, 2000; National Safety Council, 2001).

- **Near Miss Reporting Process**

Federal OSHA has identified basic criteria for reporting unsafe conditions in the workplace. 29 CFR 1960. Although applied to federal employees, it clearly expresses expectation of employers to safeguard the workplace (Occupational Safety & Health Administration [OSHA], n.d.).

Any employee who believes there is an unsafe working condition or unhealthy exposure exists in the workplace has the right and is encouraged to make a report to their supervisor either in oral or written form. The standard distinguishes between conditions that are an imminent threat to life and those that are nontrivial conditions (OSHA).

The standard sets forth the importance of prompt reporting and correction of the conditions are essential elements of any workplace Occupational Health & Safety system. Supervisors

of these employees are obligated to provide clear direction surrounding these reported unsafe conditions to ensure safety of the employees while the condition exists and also during mitigation.

Employees who report unhealthy workplace conditions or hazards will not be subject to "restrain interference, coercion, discrimination or reprisal" (OSHA).

Near miss reporting is many times a challenge employees are reluctant to report for a variety of different reasons to include (Williamsen, 2013):

1. Sometimes there is no system of reporting within the department.
2. Employees fear that supervisors will hold near miss reporting against them.
3. Near miss reporting creates additional paperwork and investigations.
4. Employees and supervisors have not been trained on how to report near miss events.
5. Employees become discouraged when nothing is done to correct the cause of a near miss incident. (Williamsen, 2013)
6. From a social or cultural aspect, reporting for an employee is a risk because they may be retaliated against or may be labeled a squealer.

This creates a situation of no incentive for the employee to make near miss reports as nothing is gained individually or as an organization. (Williamsen, 2013)

Below are four additional obstacles to reporting from another source:

1. Unfortunately near misses can become so frequent they are part of the everyday work life and therefore become tolerable.

2. Employees fear the possibility of penalty or job loss if they are found to be a contributing factor to a near miss incident.
3. It is possible that an established process for near miss reporting is so complicated or complex that nobody truly understands the process and therefore it is underutilized.
4. In some instances organizations have not assigned near miss reporting to a single individual; therefore there is no follow-through or corrective measures to deal with the situation that caused a near miss and workers become of the mindset that being safe in the workplace includes being lucky. (Tippet, 2007)

- **Safety Officer or SMS assesses**

The employer is required to assess or investigate these unsafe condition reports in a timely manner. Employees are allowed to make reports in an anonymous fashion, although that limits the ability for the department health and safety officer to contact the reporting individual should additional information be needed (OSHA).

The US Department of Labor Occupational Health & Safety administration produces fatal facts accident reports. Contained within those reports are fatal accident categories that outline major categories that affect the US workforce (Agnew & Synder, 2008, p. 7). A comparative thought process is that many times emergency workers try to separate themselves from general industry. However, when general industry hazard exposure is compared to the fire service, a close resemblance exists between the workforces. Below is a partial list identified as fatal accident categories (Agnew & Synder, 2008, p. 8):

Fatal accident categories:

- fall from a different level
- crushed by falling wall

- caught between
- trench cave-in
- struck by falling object or machinery
- electrocution
- fire and explosion
- fall from roof
- death due to burn
- hazardous atmospheres

For hazard assessment purposes a nonjudgmental non-faultfinding approach can assist safety officers in determining modifying conditions, sequence of events, and conditions that led up to the event. Many times fire departments do not recognize many of the warning signs or lose situational awareness that can contribute to an injury. As addressed throughout this report roughly 600 near misses occur for every serious injury. Historically the fire service has not documented these events and has accepted the degree of risk to a point of passive tolerance. (Dodson, 2007, p. 309).

Incidents of near miss and accidents are the result of a series of conditions and circumstances that have led to an unsafe condition which may result in injury or property damage. The assessment of this unsafe condition is an opportunity to identify the events in an accident chain. These opportunities to discover and evaluate elements of the chain have five components (Dodson, 2007, p. 310):

- The environment and physical surroundings;
- Human factors - components of human behavior, training and use of or failure to use recognized practices and procedures;
- Equipment - limitations, restrictions, maintenance and serviceability of personal protective equipment;

- Event - the intersection of the first three accident chain components that bring them together in a way to create an unsafe or unfavorable condition; and
- Injury or potential injury - damage associated with the accident. In the case of a near miss the injury can be supposed (Dodson, 2007, p. 310).

Health and safety officers as leaders of the safety culture must understand that hazard analysis and the dynamic nature of risk prevention are the foundational keys to begin the reduction of near miss incidents. Hazard condition reporting must be more formalized in a written procedure that promotes observation and encourages the reporting of hazards. To complement this process many successful programs have instituted employee recognition programs in conjunction with hazard reports (National Safety Council, 2001, p. 301).

- **Corrective measure or action is taken**

Hazard prevention and control comes through a process of assessing identified hazards and devising a method and plan to control or eliminate identified hazards. Three recognized methods of control in the safety profession include engineered controls, administrative controls, and work practice controls. The safety professional must identify what is the most practical control method to apply to the identified hazard. Many times hazards cannot be completely eliminated; as a result they are either minimized or mitigated for a certain time. As a last resort employers can provide employees personal protective equipment when all other reasonable means of hazard control are not possible. Although the terminology is somewhat ambiguous, it is the obligation of the employer to guarantee the health and safety of all employees (Balge & Krieger, 2000, pp. 320-321; National Safety Council, 2001).

- **Documentation**

Cal/OSHA is specific on documentation and recordkeeping. In many citation cases documentation was inadequate. The golden rule for Cal/OSHA is if it wasn't written down, it didn't happen. Record retention is outlined in a variety of different areas. Typically Cal/OSHA requirements are one year minimum and up to three years and as many as 30 years if it deals with employee exposure to hazardous chemicals and occupational medical records. The HSO must decide upon a record retention strategy as it relates to near miss reporting. Record retention means nothing if reports cannot be located. All the effort invested into this audit process, inspection process, and data analysis will be irrelevant if the information is lost or cannot be located (Balge & Krieger, 2000, pp. 114-115).

- **System wide communication**

The regulations set parameters for the employer regarding resolution of unsafe conditions depending on the various time frames of certain industries. However, the employer is required to make a broad communications system to all employees and also to provide a follow-up report as necessary to the individual(s) that initiated the hazardous condition notification (OSHA).

One element of good communication in NMR includes the opportunity for supervisors and team leaders to benefit from using a two-way communication system. A good communication system solicits feedback and encourages an open exchange of ideas. The system engages all employees to communicate and the leader acts as the facilitator to disseminate information. The leader also emphasizes that every employee's opinion is respected. This open communication also becomes a tool for building strong morale (National Safety Council, 2001, p. 16).

In addition, different forms of communication should be considered: formal written reports, memos, meeting minutes, and typically, letters. Often underutilized forms of communication include informal talking sessions, handouts, and safety bulletins. Many communications are mandated when it comes to identifying hazards. Within the NMR system a designated communication path should be mapped out similar to work flow process charts (National Safety Council, 2001, p. 17).

- **Auditing**

Evaluation of auditing methods should be developed prior to NMR implementation. A clearly outlined process that addresses a standard operating guideline should be established to ensure consistent audit methods. It is a well-known saying in business that: "What gets measured gets done." This applies directly to the health and safety audit process. "What gets measured gets targeted for improvement because a good audit serves as an educational tool." (National Safety Council, 2001, p 74)

Most audit processes in corporations reside with the health and safety core group. This team consists of individuals with technical expertise and knowledge of the facility and skill within the specific business. The objective of audits is three-fold:

1. measuring compliance with specific regulations;
2. benchmarking with established goals; and
3. identifying potentially hazardous conditions for which standards do not exist.

Communication of audit reports is important in order for employees to understand waste or correction. Communications happen regardless of whether reports are good or bad.

Communications should be evenly distributed to encourage employees to strive for excellence and consistently safe work practices (National Safety Council, 2001, pp 78 – 80).

In a separate report dealing with construction and other private industries' safety programs, safety teams around the nation believe there are five fatal flaws that bury NMR programs (Chen & Jin, May 2013):

- Upper management believes in the program and provides financial support; however, they are not engaged and do not know how to become so;
- Safety professionals who have the technology to be successful struggle with effectively teaching the organization that which is intuitive to them;
- Supervisors who do not want workers to get injured are overburdened with meaningless tasks;
- Hourly workers want to know "what's in it for me" in near miss reporting; and
- Data management can be a hindrance when no reports are received or known data available to analyze problems; therefore they remain unknown (Chen & Jin, May 2013).

There are many different factors affecting safety culture, one specific people factor that has had major influence is attitude and is by far the most difficult to address. Perhaps this is why attitude and behaviors receive the least amount of attention in terms of safety. Many times the complexities surrounding an accident, near miss or injury are compounded by placing blame to a specific individual. Individual attitudes have many different dynamics and a few are incredibly prevalent in the fire service. A fire department organizational culture is made up of ideals, customs, traditions, knowledge and skills that are passed on for decades before it is recognized that change is needed (Dodson. 2007, p. 33).

Competition and "that's the way we've always done it," along with mega egos and other personal attitudes are a few influencers that affect the safety culture in the fire service today. Until an agency or an individual has a significant emotional event, people oftentimes are unwilling to change. Many studies have proven that a traumatic death is one event that is capable of changing a person's values, thereby causing re-programming focused more on safety and health (Dodson. 2007, p. 34).

The HSO's role as a safety leader is designed to protect the people of the organization and should understand that near miss reporting does not come naturally (Petersen, 2008). A safety culture model that has been widely accepted was developed by M.D. Cooper of Safety Science. This safety culture model includes three key areas of focus: the person, the environment and the behavior. Contained within the model is a safety climate survey for each employee. This survey is helpful in understanding the employee's shared perceptions and attitudes about safety, which ultimately reflects safety culture in the workplace (Chen & Jin, May 2013).

Confidential attitude surveys conducted by consulting firms in a number of companies have revealed that it is fairly common for supervisors to hide accidents and is even more common for the employees who cause them. This occurs for many different reasons -- fear, discipline, concern about reputation, and/or desire to not interrupt work. Most of these barriers to reporting accidents are eliminated by creating models that remove the aforementioned barriers (Petersen, 2008).

The second focus area is the belief that the individual person also influences the environment within the workplace. The environment is associated with the safety management system, a

system of audits and inspections, all aspects of the organization's safety management system, all of which reflect safety culture within each operational area (Chen & Jin, May 2013).

The third area of focus is behavior; the safety behavior study or behavioral sampling measures the actual safety-related behaviors and unsafe acts which show employee engagement or unintentional and willful negligence (Chen & Jin, May 2013).

Also within the safety culture, organizations have adopted a set of nonnegotiable behaviors within the safety program. These are behaviors that are absolutely not tolerated in any way, shape or form in the workplace. A partial list of Industry's Top 10 nonnegotiable behaviors includes (Chen & Jin, May 2013):

- working on an elevated surface without fall protection,
- struck by accidents where employees disregard danger or barrier areas,
- caught between working in unprotected trenches and excavations, and
- electrical - working without lockout tag out and within 10 feet of power lines.

Private industry companies have adopted these nonnegotiable behaviors to set a well-defined management system to deal with employees that willfully disregard critical safety systems (Chen & Jin, May 2013).

The study on safety culture models has shown an absolute relationship between improved safety statistics and the environment of the workplace. When employees at all levels of administrative management and operations believe that safety is a key element of organizational success, companies have proven to be able to reduce risk and loss associated to near miss events (Chen & Jin, May 2013).

The Phoenix Fire Department has provided an excellent example as one of the nation's most proactive and progressive departments. In a document known as the "Phoenix Fire Department Way" their organizational values statement is set forth below.

SAFETY

We practice safety in observance of our risk management profile.

We will risk our lives a lot in a calculated manner to save savable lives.

We will risk our lives a little in a calculated manner to save savable property.

We will not risk our lives at all for lives or property that are already lost.

The safety of our members and our community is our primary objective. It is the driving force of all we do and the essence of the service we provide. Whether during our daily activities or during fire-ground, EMS or training operations, we observe and live by our standard operating procedures. We are safe because we always maintain situational awareness. Our members are personally accountable for total wellness. This means we are prepared and fit for duty, physically and mentally. (Phoenix Fire Department [PFD] website. n.d.)

The unique element within the Phoenix Fire Department is that the organizational values statement is a collaborative agreement between the fire department and the employees' labor union. The solidarity contained within this safety mission statement is reflective top to bottom of the organization's beliefs and values as it relates to employee safety.

NMR has found that in a lessons learned study many people were willing to self-report about significant events. Data collected by NFFNMRS in 2006 indicated that of 580 events, 383 were reported by members involved in the event, which represented 66% of the events that were

self-reported; 99 events were reported by others as “told of the event category” which represented 17%. The remaining 25 events were told to safety officers and 73 events were reported by witnesses of an event (Tippett, 2007).

One of the significant findings of the study of NMR in 2006 indicated that fire departments collectively need to adopt an error management approach to firefighting performance to understand what causes the errors or lack of judgment specific to each event. Errors in these near miss events occurred because of incorrect information provided, poor decision-making, and loss of situational awareness and underestimation of critical incident factors (Tippett, 2007). Fire departments must adopt an error management philosophy that creates different approaches to dealing with individuals who make unintentional mistakes versus willful policy violations (Tippett, 2007).

Finally, NMR must add supplemental questions to departmental policies, standard operating procedures and organizational elements including culture to assist reviewers in the analysis of the NMR system (Tippett, 2007).

The use of awards can be used to motivate employees to perform work-related tasks in a safe manner. In several of the motivational models, rewards and promotions and other incentives are used to recognize individual’s contributions to process improvement. Organizations as well have used similar incentives to acknowledge teams that have achieved high performing company level objectives in order to celebrate achievement (Hagan, Montgomery, O’Reilly, 2001).

Generally speaking, the use of awards such as salary increase and promotion can be a tool to create positive influence within the workplace. This motivation can have a positive effect on

employees' behaviors and attitudes which can be directly related to the safety culture. These factors take on added significance to important job-related tasks (Hagan et al., 2001).

A counterproductive aspect of a reward system is that to a certain degree it can create a competitive or "at all cost" type of culture within the organization. Without regular monitoring certain corporations have reported that safety-based incentive programs lead to underreporting of injuries due to the fact that employees are concerned about breaking important safety awards records or strings. To counter this problem many employers have created incentive programs that look for employees doing purposeful and intentionally safe behaviors. An example of this is a program known as "caught you being safe." This program acknowledges employees who demonstrate an attitude towards safety-based behaviors (Hagan et al., 2001).

The last drawback of safety incentive programs is when they are used for a tool by management to promote individuals who are not necessarily worthy of acknowledgment or the program is held hostage by political agendas. Many times employee unions and management find themselves struggling with these types of complications within an award program (Hagan et al., 2001).

Procedures

The process for this applied research project began with a comprehensive gathering of relevant research material. The researcher began this process in July 2015 and continued through September 2015, utilizing the resources of the Learning Resource Center Library of the United States Fire Administration's National Fire Academy. This comprehensive quest to gather resources and reference material was not only specific to public safety and emergency response, but also included an in-depth attempt to locate information outside the fire service. Although the

NFFNMRS model on NMR systems sets an excellent foundation for the fire service, the researcher's intent was to identify an existing high-performing and robust NMR system (Hagan et al., 2001, NFFNMRS, 2009, p. 7).

The initial research and literature review consists of traditional fire service systems, including the national model. Extensive information was located and researched with respect to the legal requirements and recommendations for near miss reporting and risk management. This research project clearly sets forth the responsibility of fire departments which are considered to be high risk employers to develop sufficient reporting systems to measure and reduce occupational injury. Sufficient legal and best practice recommendations exist for fire departments to implement NMR successfully (Hagan et al., 2001, NFFNMRS, 2009).

Additional literature review included researching contemporary reporting models from private industry. Reference material sources developed by the National Safety Council and the American Society of Safety Engineers proved invaluable in providing information for this project. Part of the research process was to engage local private industry to discuss their success with NMR. Although many of the modern private industry reference resources were utilized during the research, it was discovered that most of the material dealt specifically with risk management, professional safety topics and left a significant void about precise instructions on the actual development and implementation of NMR.

Currently the SFD embraces the concept that NMR would have widespread and significant impact to the organization if implemented. Due to the complexity of this topic the researcher engaged the SFDSC in a fundamental discussion about importance and relevance regarding a NMR system. On September 17, 2015 the researcher explained the role of NMR at a

regularly scheduled safety committee meeting (see Figure 6). Much discussion ensued concerning this topic in regards to the lack of labor management relations, impact to the members, and the involvement of outside departments overseeing risk management for the SFD. At the end of this single discussion it was agreed that the development of a NMR system was important, although it would require a subcommittee development type approach. It was also agreed by the SFD safety committee that whatever type of system was designed, utilization would be directly linked to punitive outcomes for the reporting employees.

The absence of internal data regarding injuries and near miss events led the research to the development of simple matrixes to begin tracking department injuries and vehicle-related incidents. The SFD injury matrix includes years 2012-2014 (see Figures 1, 2, and 3). The vehicle accident matrix spans one year 2015; however, it is anticipated that the tracking will continue as a basis for monitoring incidents that have not been prevented (see Figure 4).

The research involved subject matter experts in the industry of occupational injury. Four different categories of experts were considered in developing this research project. Those categories included an industrial hygienist, a worker's compensation claims manager, a deputy director of risk services, and a liabilities claims manager. Pre-interview screenings were conducted in September 2015 with each person responsible for overseeing those areas of expertise. As a result of the prescreening, interviews with the deputy director of risk services and the workers compensation claims manager were conducted.

In an attempt to understand the basic key elements of a NMR system, interviews were conducted with the above-mentioned experts. During this interview process a systematic approach was taken during these one-on-one interviews (see Figure 7). During each of these

interviews it was discovered that both risk services and workers compensation dealt specifically with the elements of post-event injury or accident consequences. Although risk services is heavily engaged in elements of employee training, it was realized that risk and safety training was high in regard to volume, but it was more tailored towards a generic one-size-fits-all model and rolled out to all departments and employees. It was also discovered during these interviews what a limited understanding each individual had about the complex topic of NMR systems. Both risk services and workers compensation experts had very specific pathways for return to work programs and risk reduction as it related to facility safety issues, well-maintained equipment and certain mandated employee behavior training, such as harassment and workplace violence. The relevancy of NMR yielded very little specific information. In both cases the interviews concluded with a concurrence that NMR was embedded in the injury illness prevention programs and that it would be a sufficient system for the City of Stockton. The interviews conducted clearly did not meet the intent of this research project; Identifying essential elements of near miss reporting.

San Joaquin County Fire Agencies, 14 in total serving a population of approximately 650,000, do not have any organized system for near miss reporting. During the development of this research project it was learned that most agencies are looking for leadership in fire department safety and specifically for a NMR system. In one particular case an agency indicated that they would be contacting the resources of the SFD to assist in any serious accident review teams should the need arise in their agency.

Limitations:

The results of this research project have many limitations; as stated above significant information exists in the conceptual design and development of near miss reporting. However, the research results lack the practical implementation of a well-designed NMR system. The expectation that a plug-and-play type system exists within public safety in this region was not evident. Specific templates and blueprints on the how-to's for NMR simply were not found. Many professional safety experts have proven that NMR deals with individual behaviors and attitudes and this is why many organizations are unwilling to tackle the challenges associated with employee behaviors.

This research project did not address elements of organizational health, labor management relations, and organizational trust. Moreover, the legal elements and implications of creating a program that essentially self-reports its own safety violations was not discussed. Many of the research concepts identified in this project are affected by the rules of engagement as it relates to employment. Most public agencies within California are represented by employee associations or unions and significant resistance could be met with any program that will yield consequences or shift the onus of responsibility to the employee. The lack of organizational trust of management is a confirmed obstacle to NMR systems.

The researcher also attempted to engage private industry in modeling a functional NMR system. Two private entities contacted during this research project have had certain successes in the reduction of occupational injuries and near miss events. A gas and oil safety professional who is an expert in occupational NMR and has overseen this type of reporting system for over 15 years was willing to informally discuss elements of their system, but was not willing to contribute to this research project since the appropriate internal legal clearances had not been

obtained. A similar response was met with a private employer of a metal fastener corporation local to this region. Both companies have been recognized as leaders in Occupational Health & Safety risk reduction programs. A limitation of this research project is to understand functional systems and taking components of those and applying it to the needs of the SFD.

Results

The results for this research project are provided below:

What are California regulatory requirements for reporting near miss events in the workplace?

As a result of this research, it was discovered that a comprehensive regulation outlined by Cal/OSHA takes the focus and the responsibility of worker safety and directly transfers it to the employer – the SFD. Specific instructions are given in Cal/OHSA IIPP model programs T8 CCR 3203 – injury illness prevention programs. This program is mandatory. The employer's responsibility includes but is not limited to hazard assessment, recognition, mitigation and communications; all are key components of a comprehensive near miss reporting system (NFPA 2013 Annex D 1, Cal/OSHA,1991).

What are national best practice models for near miss reporting?

The recommendations and best practice models come directly from NFPA 1250, 1500 and 1521. Each one of these recommendations and technical reports gives specific guidance and is a pathway to the development of world-class Occupational Health & Safety Systems. Furthermore, the NFFNMRS is an outstanding example of data collection and national communications method for near miss situations that fire departments encounter. The research

did ascertain that the amount of data being collected for NMR is limited (NFPA 2013 Annex D 1).

The model fire department for risk management and developing the overall safety culture is the Phoenix Fire Department. The examples of safety culture they provide to their employees allow an avenue to build trust within the system of NMR.

What are the essential components needed for the Stockton Fire Department near miss reporting?

The research yielded a comprehensive understanding of the seven key components of designing a NMR system. The system is simple yet has the ability to collect and analyze each near miss event (see Figure 5). The SFD currently has fractional elements of near miss reporting, but lacks an actual defined organized system. The SFD is in need of creating a safe avenue for employee reporting. The NMR system will have to be promoted and a method needs to be developed to incentivize reporting. Safe work practice behavior will be an essential element for success (NFFNMRS, 2009).

What internal means are needed to establish reporting effectiveness, collect and analyze data?

The SFD currently has no system in place to encourage and promote employees to report near miss events. In order to accomplish this, this NMR system must be developed in a transparent fashion and should incorporate all levels of the organization. The NMR has to be embraced by all levels of the organization, beginning with Fire Management (NFFNMRS, 2009). Recently purchased software through Firehouse Analytics will be part of the data analysis tool in managing this NMR system. In addition, matrix sheets tracking occupational injury and post-

event analysis will assist in mitigating reoccurring occupational injury and mishaps (see Figures 1, 2, 3, and 4).

Discussion

This research project found a significant amount of information regarding legal requirements of the employer to develop risk reduction management plans, as well as safety management systems. Within the public-sector a limited amount of information exists for near miss reporting statistics. Additionally a large amount of information exists on models and concepts surrounding the importance of near miss reporting which will aid the SFD with NMR implementation (NFFNMRS, 2009).

It is unrealistic to think that all of the total case injury rates (TCIR) reported constitute moderate to significant injury; however, it is safe to say that 30-35% of the SFD injuries require emergency medical treatment. If we apply concepts of the hazard pyramid we realize that the SFD experiences many unsafe conditions. It is likely that we have a similar amount of unsafe behaviors (Hagan et al., 2001, NFFNMRS, 2009).

The inability to analyze near miss incidents as well as injury data only disguises a bigger problem within the SFD organization. Empirical near miss and injury data with proper analytics will paint a picture within the fire department clearly identifying the importance of NMR system implementation (NFFNMRS, 2009). Within the research, the national NMR system seems to lay the foundation and produce the necessary data management the SFD would need to support NMR. The ability to have autonomy certainly is an incentive to individuals who may be otherwise hesitant in filing these much-needed reports. The research identified concepts such as error management systems and nonjudgmental approaches that will create incentive for these

employees who will ultimately benefit most from this reporting system (Hagan et al., 2001, NFFNMRS, 2009).

Fire administration will have to accept the fact that disciplinary action for errors in judgment will have to be considered "re-training opportunities" and coaching sessions and not necessarily an opportunity to step into a progressive disciplinary process. If discipline after reporting becomes the standard, it is most certain the agency and its employees will revert back to the status quo of non-reporting and underreporting incidents. The researcher feels that NMR system is a much-needed tool for a comprehensive risk reduction program. The implications of implementation will reveal the true cost and impact of injured employees and the effects on the organization. This reality provided through statistics will absolutely be a measurement and snapshot for the organization. This tool alone will begin creating a culture of change as it relates to occupational injury. It is the researcher's opinion that when this information becomes known, it will be met with resistance, possible reactionary modification to fire ground operations, and certainly to standard operating procedures. Based on findings and research it could be anticipated that full implementation of the near miss reporting system could take as long as three years. Within three to five years it is anticipated that relevant data sets will indicate trends as they relate to occupational safety and health.

Recommendations:

The general purpose of this project is to provide the SFD with a prototype near miss reporting system. By utilizing descriptive research based on the data and information collected, the SFD will have the foundational basis for design criteria and implementation of a NMR system. This NMR system can reduce the number of injuries both minor and serious throughout

the organization. The intent is to systematically and consistently lower the number of occupational injuries. The researcher compiled data and studied various models to form a reporting system that will add value and trust to the emerging safety culture. (Hagan et al., 2001, NFFNMRS, 2009).

Based on the results of this research, the recommendations are:

- Implement a two-tier NMR system. For low to moderate near miss rated incidents, internal reporting completed and resolution obtained. For high severity near miss incidents, both internal and national reporting completed to include a core internal fact-finding, post incident analysis, immediate or time specific resolution obtained with system wide communication (Hagan et al., 2001, NFFNMRS, 2009).
- Design a comprehensive risk management plan as outlined in NFPA 1250, 1500 and 1521. This will include a comprehensive risk management training track for all safety committee members as recommended by ASSE (Hagan et al., 2001).
- Create an incentive-based program for employees to report near miss events. This will include revisiting previous programs and comparing them to modern high performing incentive programs (Hagan et al., 2001).
- Implement a comprehensive data analysis system of evaluating injuries, associated cost and return on investment safety improvements. This recommendation utilizes existing data analysis personnel and software systems (Hagan et al., 2001).

The benefits of this implementation are yet to be determined. The effectiveness of the system will be based on the employees' willingness to use the NMR system. Measurement tools and data analysis is crucial to beginning to observe incident trends. Many private companies who

have successfully implemented such models have made monumental progress in reduction of serious worker injuries and illness.

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Figure #1

2012 OSHA 300 Report

			Classify the Case																
Injury Date	Where the event occurred	Describe injury / illness	Death	Days Away From Work	Job Transfer / Restriction	Other Recordable Cases	First Day Off Work	Last Day Off Work	Total Days Off Work	First Day of Modified	Last Day of Modified	Total Days of Modified	(1) Injury	(2) Skin Disorder	(3) Respiratory	(4) Poisoning	(5) Hearing Loss	(6) Other
01/02/2012	110 W Sonora St., Stockton	MRSA		1	0	0	01/06/2012	01/11/2012	5			0	✓					
01/05/2012	5525 Pacific Ave., Stockton CA	Hurt left shoulder		0	0	1			0			0	✓					
01/12/2012	110 W Sonora St., Stockton	Strained lower back		0	0	1			0			0	✓					
01/16/2012	2908 W March Ln., Stockton	Ear Pressure/loss of hearing		1	0	0	01/16/2012	01/27/2012	11			0						✓
01/18/2012	1045 Charter Way, Stockton	Hurt lower back		0	0	1			0			0	✓					
01/22/2012	550 E Harding Way., Stockton	Hot water burns		1	0	0	01/23/2012	02/07/2012	15			0	✓					
02/12/2012	1230 E Hazelton	Upper back pain		1	0	0	02/14/2012		180			0	✓					
03/04/2012	4227 N El Dorado St.	Burns to ears and wrist		0	0	1			0			0	✓					
03/14/2012	Manthey & Chicago	Twisted knee & back		1	0	0	03/15/2012	03/19/2012	4	03/15/2012	03/19/2012	4	✓					
03/22/2012	110 W Sonora St.	Possible MRSA		1	0	0	03/22/2012	03/27/2012	5			0		✓				
04/01/2012	I-5 North of March Ln.	Hurt left hip		1	0	0	04/03/2012	04/12/2012	9			0	✓					
04/01/2012	1116 E First St., Stockton	Back pain/spasms		1	0	0	04/05/2012	04/17/2012	12			0	✓					
04/02/2012	110 W Sonora St.	Blunt trauma to Right foot		1	0	0	04/03/2012	04/04/2012	1			0	✓					
04/08/2012	3939 N Pershing Ave.	Lower back injury		1	0	0	04/10/2012	04/23/2012	13			0	✓					
04/12/2012	5341 Passero	Injury left hip		1	0	0	04/12/2012	05/24/2012	42			0	✓					
04/16/2012	1621 N Filbert, Stockton	Needle stick to thumb		0	0	1			0			0	✓					
04/26/2012	110 W Sonora St.	Injured elbow		0	0	1			0			0	✓					
04/26/2012	3606 Hendrix Dr Stockton, CA 95212	Lower back		0	0	1			0			0	✓					
04/30/2012	425 N El Dorado St Stockton, CA 95202	Left leg		1	0	0	04/30/2012	06/04/2012	35	06/04/2012	07/23/2012	49	✓					
05/05/2012	1501 Ploardy Ln., Stockton	Swollen right ankle		1	0	0	05/05/2012	05/10/2012	5			0						✓
05/16/2012	Hwy 99 at E Mariposa Rd	Back		0	0	1			0			0	✓					
05/16/2012	East Frontage Rd/Mariposa Rd	Lower back		1	0	0	05/16/2012	07/12/2012	57			0	✓					
05/24/2012	4010 E Main Street	Hernia		1	0	0	05/25/2012	08/02/2012	69			0	✓					
05/29/2012	920 S Stanislaus St	Left shoulder injury		1	0	0	05/29/2012	08/09/2012	72			0	✓					
06/07/2012	2908 W March Ln., Stockton	Broken toe		1	0	0	06/07/2012	06/13/2012	6			0	✓					
06/12/2012	722 N Commerce St., Stockton	Left elbow pain		1	0	0	06/12/2012	08/17/2012	66	06/27/2012	08/17/2012	51	✓					
06/17/2012	3499 Manthey Rd., Stockton	Left foot pain		1	0	0	06/18/2012	07/05/2012	17	06/22/2012	07/05/2012	13	✓					
06/22/2012	NW corner of Maranatha & Bryant	Umbilical hernia		0	0	1			0			0	✓					
06/24/2012	2908 W March Ln	Back		1	0	0	07/02/2012	07/31/2012	29			0	✓					

2012 OSHA 300 Report

07/02/2012	Weber & Walker	Broken nose		1	0	0	07/03/2012	07/13/2012	10			0	✓					
07/03/2012	110 W Sonora St., Stockton	Hurt right chest wall		1	0	0	07/03/2012	07/16/2012	13			0	✓					
07/05/2012	908 S. American St	Sprained left ankle		1	0	0	07/16/2012	07/16/2012	0			0	✓					
07/08/2012	1116 E First Street, Stockton	Lower right back		1	0	0	07/09/2012	07/21/2012	12			0	✓					
07/17/2012	5525 Pacific Ave., Stockton	Fracture fingers		1	0	0	07/18/2012	07/25/2012	7	07/19/2012	07/25/2012	6	✓					
07/17/2012	110 W Sonora St., Stockton	Right knee pain		0	0	1			0			0	✓					
07/28/2012	French Camp and El Dorado	Heart flutter		0	0	1			0			0						✓
08/06/2012	8364 Encino Dr., Stockton	Lower back pain		1	0	0	08/09/2012	08/24/2012	15			0	✓					
08/13/2012	1523 Sierra, Stockton,	Smoke Inhalation		1	0	0	08/13/2012	08/20/2012	7			0			✓			
08/16/2012	Wilson & Weber Ave., Stockton	Exposure		0	0	1			0			0						✓
08/21/2012	110 W. Sonora St Stockton, CA 95203	Left arm pain		1	0	0	08/21/2012	08/23/2012	2			0						✓
09/01/2012	3606 Hendrix Dr., Stockton	Exacerbation of previous lower back injury		1	0	0	09/01/2012	09/18/2012	17			0	✓					
09/05/2012	345 N El Dorado St., Stockton	Hurt right knee		0	0	1			0			0	✓					
09/14/2012	845 N Golden Gate, Stockton	Sprain of neck		0	0	1			0			0	✓					
09/17/2012	1319 N Madison St., Stockton	Strained back		1	0	0	09/18/2012	10/04/2012	16			0	✓					
09/24/2012	4401 Manchester St Stockton, CA 95207	Injured right ankle		1	0	0	09/24/2012	09/24/2012	0			0	✓					
09/24/2012	4401 Manchester St	Injured left ankle		1	0	0	09/24/2012	09/28/2012	4			0	✓					
09/24/2012	1020 Rosemarie Ln., Stockton	Lower back strain		1	0	0	09/27/2012	10/09/2012	12			0	✓					
09/24/2012	1020 Rosemarie Ln., Stockton	Lower back strain		1	0	0	09/25/2012	10/01/2012	6			0	✓					
10/16/2012	1116 E First St., Stockton	Twisted right ankle		1	0	0	10/16/2012	11/16/2012	31			0	✓					
10/22/2012	3550 Wagner Heights Rd., Stockton	Right shoulder/back pain		1	0	0	10/29/2012	01/10/2013	63			0	✓					
10/24/2012	5525 Pacific Ave., Stockton	Strained abdominal muscle		1	0	0	12/05/2012	01/17/2013	26			0	✓					
11/15/2012	unk.	Left shoulder injured		1	0	0	11/13/2012		48			0	✓					
11/24/2012	1931 Latigo Way, Stockton	Lower back strain		1	0	0	11/30/2012	12/06/2012	6			0	✓					
12/06/2012	Kelly & Hammer Ln., Stockton	Exposure from needle stick		0	0	1			0			0	✓					
12/17/2012	9524 Bancroft, Stockton	Left knee pain		1	0	0	12/18/2012	01/18/2013	13	12/18/2012		13	✓					
TOTALS			0	40	0	15			961			136	47	2	1	0	0	5

Figure #2

2013 OSHA 300 Report

				Classify the Case																	
Job Title	Injury Date	Where the event occurred	Describe injury / illness	Death	Days Away From Work	Job Transfer / Restriction	Other Recordable Cases	First Day Off Work	Last Day Off Work	Total Days Off Work	First Day of Modified	Last Day of Modified	Total Days of Modified	(1) Injury	(2) Skin Disorder	(3) Respiratory	(4) Poisoning	(5) Hearing Loss	(6) Other
Engineer	01/10/2013	Zephyr Dr	Left shoulder				✓			0				✓					
Engineer	01/11/2013	1522 Sutro, Stockton	Lower back pain after fall				✓			0				✓					
Firefighter	01/19/2013	4201 Pacific View Lane, Stockton	Pain to lower back		✓			01/21/2013	01/28/2013	7				✓					
Captain	01/23/2013	1006 Rendon, Stockton	Right ankle pain		✓			01/24/2013	02/7/2013	14				✓					
Captain	02/10/2013	10411 Nations Cir., Stockton	TB Exposure				✓			0						✓			
Captain	02/12/2013	110 W Sonora St., Stockton	Hurt right arm				✓			0				✓					
Engineer	02/20/2013	2134 Erickson Pl.	Hurt lower back		✓			02/20/2013	03/07/2013	15				✓					
Engineer	02/24/2013	110 W Sonora St., Stockton	Strained lower back		✓			02/24/2013	03/04/2013	8				✓					
Captain	03/05/2013	361 W 5th St., Stockton	Neck-crushing injury		✓			03/07/2013	Retired 10/31/2013	180				✓					
Firefighter	03/06/2013	110 W Sonora St., Stockton	Right elbow pain				✓			0				✓					
Firefighter	03/25/2013	Alma & McDonell, Stockton	Blood born exposure droplet in mouth				✓			0									✓
Firefighter	03/29/2013	1767 W Hammer Ln., Stockton	Difficulty swallowing				✓			0									✓
Captain	03/30/2013	3240 Farmington Rd., Stockton	Hurt lower back				✓			0				✓					
Engineer	04/03/2013	550 E Harding Ave., Stockton	Hurt left shoulder		✓			04/04/2013	10/20/2013	180	4/22/2013	7/1/2013	70	✓					
Engineer	04/03/2013	550 E Harding Ave., Stockton	Hurt left shoulder		✓						9/23/2013	10/21/2013	28	✓					
Firefighter	04/05/2013	2223 E Lindsey St., Stockton	Hurt left wrist				✓			0				✓					
Firefighter	04/12/2013	1211 E Swain Rd., Stockton	Puncture wound from falling on axe		✓			04/15/2013	04/25/2013	10				✓					
Firefighter	04/26/2013	113 E First St., Stockton	Back spasms		✓					0	04/26/2013	04/29/2013							✓
Engineer	05/05/2013	744 N Pilgrim, Stockton	Burn to neck		✓			05/05/2013	05/06/2013	1	05/06/2013			✓					
Captain	05/14/2013	1501 Picardy Ln., Stockton	Hurt Middle Finger - right		✓					0	05/16/2013			✓					
Captain	05/23/2013	110 W Sonora St., Stockton	Hurt left hip				✓			0				✓					
Firefighter	06/04/2013	110 W Sonora St., Stockton	Hurt lower back		✓			06/04/2013	06/10/2013	6				✓					
Engineer	06/07/2013	2363 E Miner Ave., Stockton	Hurt lower back		✓			06/10/2013	07/25/2013	45	06/24/2013	07/26/2013	32	✓					
Captain	06/10/2013	Wilson Way, Stockton	Exposure				✓			0									✓
Captain	06/17/2013	I5 & Crosstown fwy	Laceration to left foot				✓			0				✓					
Firefighter	06/27/2013	131 E Gibson, Stockton	Burn to right hand				✓			0				✓					
Engineer	07/04/2013	647 E Miner Ave., Stockton	Heat exhaustion		✓			07/04/2013	07/10/2013	6									✓
Engineer	07/12/2013	10177 River Falls Cir., Stockton	Left lower back strain		✓			07/12/2013	07/15/2013	3				✓					

2013 OSHA 300 Report

Captain	07/14/2013	N/A	Heart arrythmia		✓			07/14/2013	08/19/2013	36									✓
Firefighter	07/17/2013	1145 W Charter, Stockton	Hurt right shoulder				✓			0				✓					
Captain	07/19/2013	3601 Pacific, Stockton	Syncope/heart		✓			07/19/2013		165	07/29/2013		155						✓
Captain	07/23/2013	5016 Jetty, Stockton	Hurt right foot				✓	08/02/2013	09/3/2013	32				✓					
Firefighter	07/28/2013	550 E Harding Way, Stockton	Hurt right shoulder		✓			07/29/2013	08/2/2013	4				✓					
Captain	08/12/2013	6800 West Ln., Stockton	Lower back pain				✓			0	08/26/2013	10/31/2013	66	✓					
Captain	08/12/2013	6800 West Ln., Stockton	Smoke inhalation / over-exertion		✓			08/12/2013	08/19/2013	7									✓
Engineer	08/14/2013	1338 E Weber Ave., Stockton	Hurt right arm & hip		✓			08/14/2013	08/25/2013	11				✓					
Captain	09/01/2013	8003 N El Dorado St., #10, Stockton	Exposure				✓			0									✓
Firefighter	09/02/2013	1550 B St., Stockton	Hurt lower back		✓			09/02/2013	09/9/2013	7	09/10/2013	09/23/2013	13	✓					
Engineer	09/10/2013	705 Ozark Ct., Stockton	Burns to both arms				✓			0				✓					
Engineer	09/17/2013	4724 Tanglewood Ct., Stockton	Burn to right leg				✓			0				✓					
Firefighter	10/03/2013	800 W Church St., Stockton	Right elbow strain				✓			0				✓					
Firefighter	10/17/2013	1701 Knickerbocker, Stockton	Hurt back, neck and upper right arm				✓			0				✓					
Engineer	10/25/2013	110 W Sonora St., Stockton	Pain in left calf		✓			10/25/2013	11/12/2013	18	11/6/2013	11/12/2013		✓					
Captain	11/15/2013	1501 Picardy, Stockton	Dizzy / chest pain		✓			11/15/2013	2/16/2014	46									✓
Firefighter	11/28/2013	1842 Tuxedo, Stockton	Nail into left palm				✓			0				✓					
Engineer	12/27/2013	1501 Picardy Ln., Stockton	Left shoulder pain				✓			0				✓					
TOTALS				**0**	**22**	**0**	**23**			**801**			**364**	**34**	**0**	**1**	**0**	**0**	**10**

Figure #3

2014 OSHA 300 Report

				Classify the Case																	
Job Title	Injury Date	Where the event occurred	Describe Injury / Illness	Death	Days Away From Work	Job Transfer / Restriction	Other Recordable Cases	First Day Off Work	Last Day Off Work	Total Days Off Work	First Day of Modified	Last Day of Modified	Total Days of Modified	(1) Injury	(2) Skin Disorder	(3) Respiratory	(4) Poisoning	(5) Hearing Loss	(6) Other
Engineer	01/10/2014	1520 N El Dorado St., Stockton CA	Hurt left shoulder				✓			0			0	✓					
Firefighter	02/06/2014	1767 Middlefield, Stockton	Swelling in right elbow				✓			0			0		✓				
Captain	02/08/2014	Unknown	Low back pain				✓			0			0	✓					
Engineer	02/12/2014	393 Jill Circle, Stockton	Exposure to Hepatitis C				✓			0			0						✓
Engineer	03/03/2014	1116 E First St., Stockton CA	Chest pain/diaphoresis		✓			03/03/2014	03/14/2014	11			0						✓
Firefighter	03/04/2014	2041 Navy Drive, Stockton	Right & Left hand pain		✓			03/14/2014	03/16/2014	2	03/17/2014	03/23/2014	6	✓					
Captain	03/12/2014	1116 E First St., Stockton	Basil cell carcinoma to left temple				✓			0			0						✓
Firefighter	04/14/2014	1801 E. March Lane, Stockton CA	Cardiac Arrhythmia				✓			0			0						✓
Captain	04/15/2014	Rough & Ready Island, Stockton	Hurt left shoulder		✓			04/16/2014	04/17/2014	1			0	✓					
Captain	04/16/2014	Unknown	Cumulative Right Shoulder Injury				✓			0			0						✓
Captain	04/21/2014	Stockton, CA	Cumulative back injury		✓			04/21/2014	12/11/2014	180			0	✓					
Firefighter	04/21/2014	1044 David St., Stockton	Whooping cough exposure				✓			0			0			✓			
Firefighter	04/28/2014	Stockton, CA	Hurt left eye				✓			0			0	✓					
Firefighter	05/05/2014	5300 Strawberry Way, Stockton	Chipped tooth				✓			0			0	✓					
Captain	05/19/2014	110 W Sonora St., Stockton	Hurt left foot		✓			05/20/2014	05/27/2014	7	05/28/2014	06/06/2014	9	✓					
Engineer	05/26/2014	110 W Sonora St., Stockton	Strained right elbow				✓			0			0	✓					
Firefighter	05/28/2014	1601 Stanford, Stockton, CA	Right eye and cheek injury				✓			0			0	✓					
Firefighter	06/01/2014	1319 N Madison, Stockton	Lower back strain				✓			0			0	✓					
Captain	06/01/2014	110 W Sonora St., Stockton	Right shoulder pain				✓			0			0	✓					
Engineer	06/11/2014	110 W Sonora St.,	Strained left achilles		✓			06/11/2014	06/22/2014	11	06/25/2014	10/21/2014	118	✓					
Battalion Chief	06/12/2014	Unknown	Cardiac issues		✓			06/12/2014	08/01/2014	50			0						✓
Firefighter	06/21/2014	1767 W Hammer Ln., Stockton	Neck pain w/left arm numbness		✓					0	06/23/2014	09/23/2014	92	✓					
Engineer	06/25/2014	550 E Harding Way, Stockton	Shin/leg pain		✓			06/25/2014	06/30/2014	5	07/01/2014	07/14/2014	13	✓					
Captain	07/05/2014	1426 Williams St., Stockton	Hurt left knee		✓					0	07/07/2014	07/14/2014	7	✓					
Firefighter	08/22/2014	3208 Wallace St., Stockton	Right knee pain		✓			08/22/2014	8/24/2014	2	8/25/2014	10/10/2014	46	✓					
Engineer	08/26/2014	1173 Hutchins Ave, Stockton, CA	TB Exposure				✓			0			0			✓			
Engineer	08/26/2014	1173 Hutchins Ave, Stockton, CA	Exposure, infectious disease				✓			0			0			✓			
Captain	08/27/2014	40 South Union St., Stockton	Puncture to finger				✓			0			0	✓					
Engineer	08/27/2014	110 W. Sonora St	Elbow				✓			0			0	✓					
Captain	09/03/2014	333 S. El Dorado	Exposure to Tuberculosis				✓			0			0			✓			
Firefighter	09/03/2014	333 S. El Dorado	Tuberculosis exposure				✓			0			0			✓			
Engineer	09/03/2014	333 S. El Dorado	Tuberculosis Exposure				✓			0			0			✓			
Engineer	09/10/2014	110 W. Sonora St	Rhabdomyolsis				✓	09/11/2014	09/30/2014	19	09/22/2014	09/30/2014	8						✓
Firefighter	09/20/2014	110 W. Sonora St.	Left leg & left lower back pain		✓			09/20/2014	11/01/2014	42			0	✓					
Engineer	09/29/2014	2131 S. Sacramento	Eye injury		✓			09/30/2014	10/06/2014	6			0	✓					

2014 OSHA 300 Report

Firefighter	10/14/2014	110 E. Sonora St	Left Shoulder		✓			10/15/2014	10/19/2014	4	10/20/2014	12/29/2014	70	✓					
Firefighter	11/16/2014	6706 Montauban, Stockton, CA	TB Exposure				✓			0			0						✓
Engineer	11/16/2014	6706 Montaban, Stockton, CA	TB Exposure				✓			0			0						✓
Captain	11/16/2014	6706 Montaban, Stockton, CA	TB Exposure				✓			0			0						✓
Engineer	12/04/2014	West Lane & Bianchi, Stockton, CA	Left Ankle Injury		✓			12/04/2014	01/04/2015	27				✓					
Firefighter	12/08/2014	108 40th St, Sacramento, CA	Dizziness / Hypertension/ Headache		✓			12/08/2014	12/11/2014	3			0						✓
Captain	12/08/2014	Co. 13 - 3606 Hendrix Dr	Chest Pain		✓			12/08/2014	12/09/2014	1			0						✓
Engineer	12/25/2014	8324 Griffith St., Stockton CA	Right knee injury		✓			12/25/2014		6			0	✓					
TOTALS				0	18	0	25			377			389	24	1	6	0	0	12

Figure #4 on page #57

2015 SFD Vehicle Accidents

	Accident Control Number	Accident Date	COS Unit Number	SFD Unit ID	Cause of Accident	Enright Review Status	Law Enforcement Investigation	Law Enforcement Case #	VAC Ruling	Discipline Type	Status	Employee Signed	BC PDC	Date Received	Complete	Total Vehicles	SFD Vehicle	Private Vehicle	Claim Paid
1	2015-01	Thursday, January 1, 2015	5367	E9	Rock thrown off overpass struck passenger side windshield	Yes	Yes	SPD #15-00	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes				
2	2015-02	Friday, January 30, 2015	2183	E17	Civilian vehicle backed out of parking stall and bumped E17 driver's side rear dual and drove away	Yes	Yes	SPD #15-3794	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	2	1	1	
3	2015-03	Thursday, February 26, 2015	5183		While backing from parking space, civilian vehicle backed into passenger side of vehicle. Thought he put in park but was in reverse and hit passenger door again.	Yes	Yes	SPD #15-7419	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	2	1	1	
4	2015-04	Saturday, April 18, 2015	2798	E3	While stopped at stop sign, ready to turn north on S. Union, civilian vehicle made a late, wide right turn onto 2nd St. and hit E3 bumper and drove off	Yes	Yes	SPD #15-14288	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	2	1	1	
5	2015-04.5	Thursday, April 23, 2015		E12	Civilian vehicle incident										No	2	1	1	
6	2015-05	Monday, May 4, 2015	2630	E12 / F2277	While backing engine into apparatus bay, made contact with turnout lockers located on south wall.	Yes	No	N/A -	Preventable	MOD	Employee notified by Anita	Yes	Palmer	12/29/2015 *	Yes	1	1		
7	2015-06	Wednesday, May 20, 2015	2630	E12	Apparatus door came down on top of E-12 while backing in	Yes	Yes	SPD #15-18621	Undetermined but no driver fault	N/A	Reviewed at 6/18/15 mtg. Notification to employee delayed until add'l info requested by Enright is rec'd. Reviewed at 9/29/15 meeting and findings of "undetermined."	N/A	N/A	N/A	Yes	1	1		
8	2015-07	Sunday, May 24, 2015	5365	E11	While backing up to make 3-point turn, right rear dual tires went off paved road causing E11 to lean onto a small oak tree.	Yes	Yes	SPD #15-19089	Preventable	MOD	Employee notified by Anita		Kaiserm		No				
9	2015-08	Wednesday, May 27, 2015	2743	BR 13	While entering levee access, struck a pipe bollard	Yes	Yes	SPD #15-19481	Hazard of Job		Employee notified by Anita of "PREVENTABLE" ruling. On 6/23/15 rec'd email that Giannetto was not notified of mtg and was requesting the ruling be delayed so Giannetto/Votaw could discuss with VAC. Will be discussed at 9/29/15 mtg. Reviewed at 9/29/15 mtg. and changed findings to "HAZARD OF JOB"				Yes	1	1		
10	[illegible]	Tuesday, July 7, 2015	5364	E4	While proceeding through an intersection, collided with another vehicle attempting to make left hand turn	Yes	Yes	SPD #15-25300	Hazard of Job	N/A		N/A	N/A	N/A	Yes	1	1	1	
11	2015-10	Thursday, July 23, 2015	2798	E3	While entering apparatus bay, flood light was broken off when entangled with basketball hoop net	Yes	No	N/A	Preventable	MOD	Employee notified by Anita		Healy		No				
12	2015-11	Saturday, August 8, 2015	5364	E4	Crown of helmet struck windshield causing windshield to crack	Yes	No	N/A	Hazard of Job	N/A		N/A	N/A	N/A	Yes				
13	2015-12	Monday, August 24, 2015	5263		Truck struck fire vehicle while parked at base camp	Yes	Yes	Sac Sheriff Dept #CA-SNF-001746-0001	Hazard of Job	N/A	No repair will be done on vehicle	N/A	N/A	N/A	Yes	2	1	1	
14	2015-13	Wednesday, September 16, 2015	5237	#8 Ford Exp.	Vehicle was hit while parked in Engine Staging Area	Yes	Yes	CHP #09161501887392551200	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	1	1		
15	2015-14	Wednesday, September 16, 2015	2744	#2 Ford F-450	While exiting Co. 7, struck brick work in front yard	Yes	No	N/A	Preventable	MOD	Employee notified by Anita				No	1	1		
17	2015-15	Sunday, October 4, 2015	5391	E2	While backing apparatus in rear yard of Co. 2, struck light pole	Yes	Yes	SPD #15-37671	Preventable	MOD	Employee notified by Anita				No	1	1		
18	2015-16	Thursday, October 15, 2015	2185	E14	While returning from medical call, low hanging branch struck captain side view mirror and spot light.	Yes	No	N/A	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	1	1		
19	2015-17	Saturday, October 17, 2015	5109	T3	While backing out of a driveway, front bumper scraped driveway		No	N/A	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	1	1		
20	2015-18	Tuesday, November 3, 2015	2186		While exiting apartment gate complex, 5" intake valve struck 4' high post just outside exit gate	Yes	Yes	SPD #15-41621	Preventable	MOD	Employee notified by Anita				No	1	1		
21	2015-19	Monday, November 9, 2015	5391	E2	While unattended, E2 rolled into apparatus bay door	Yes	Yes	SPD #15-42482	Hazard of Job	N/A	Employee notified by Anita	N/A	N/A	N/A	Yes	1	1		
	Pending																		
22		Saturday, September 19, 2015	?	?	Fire hose booster line fell from moving FD engine and struck civilian vehicle		?	?								1	1	1	$1,122.57
23		Wednesday, October 14, 2015	2411	T4	While responding code-3, crossed into opposite lane and struck civilian vehicle		Yes	PD #15-38975								2	1	1	
24		Friday, December 4, 2015	5365	E11	While responding code-3, struck by civilian vehicle		Yes	PD #15-45634								2	1	1	
25		Wednesday, December 9, 2015	2634	E13	While attempting to move to curb due to mechanical problems, civilian vehicle hit front bumper as he tried to pass engine		Yes	PD #15-46410											
26		Tuesday, December 29, 2015	5191	T2	While backing into apparatus bay, mirror struck brick wall		Yes	PD #15-48995											

Figure #5

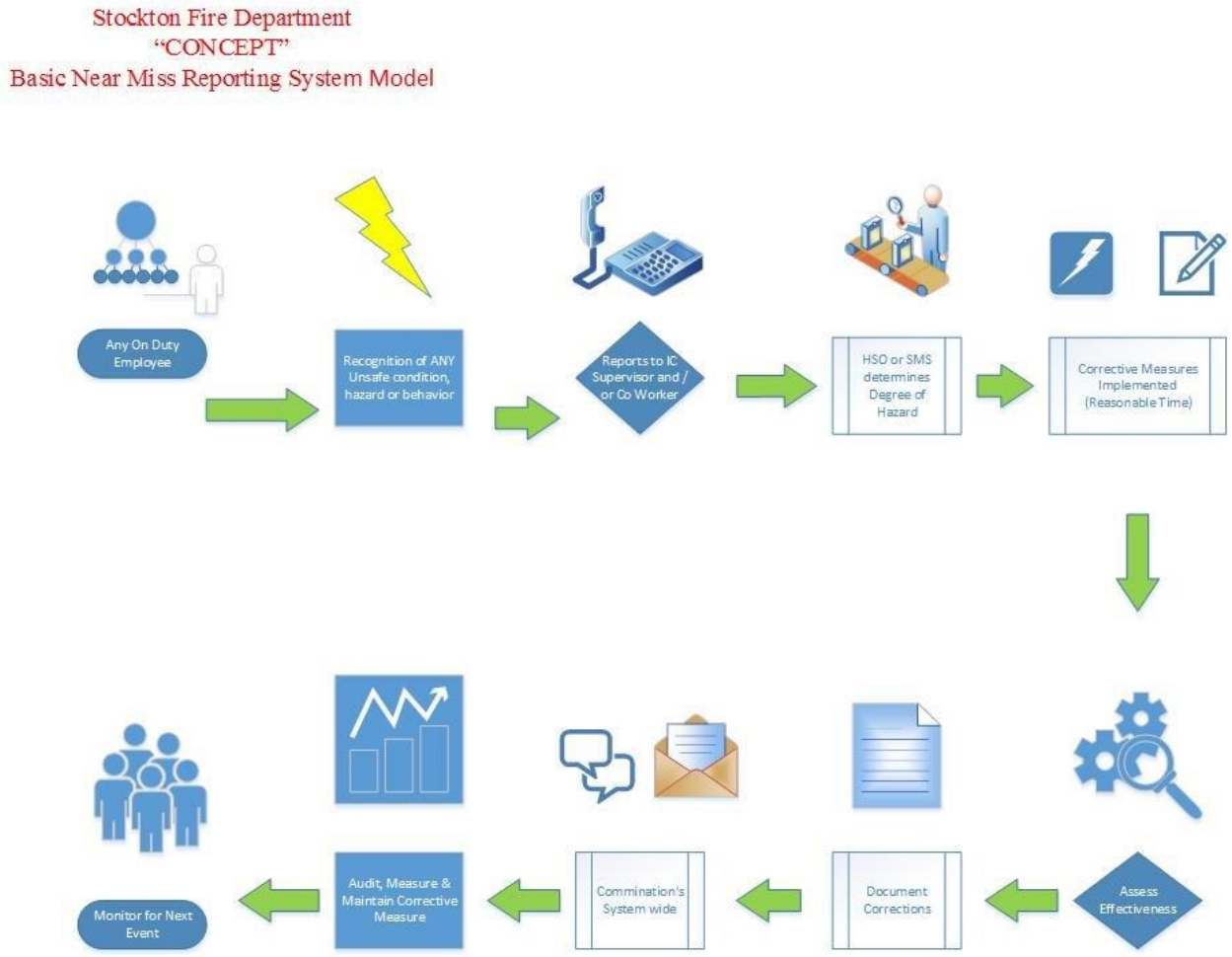
Stockton Fire Department
"CONCEPT"
Basic Near Miss Reporting System Model
Any On Duty Employee
Recognition of ANY Unsafe condition, hazard or behavior
Reports to IC Supervisor and / or Co Worker
HSO or SMS determines Degree of Hazard
Corrective Measures Implemented (Reasonable Time)
Assess Effectiveness
Document Corrections
Commination's System wide
Audit, Measure & Maintain Corrective Measure
Monitor for Next Event

Figure #6

Stockton Fire Department

Safety Committee Meeting

September 17, 2015 at Company #4 (0900 – 1100) AM

Minutes Approval August 2015:

Continued – on Going (Old) Business:

1. Wellness \ Prevention Report
2. Charter Progress – Draft Captain Duerr
3. Budget – SC $10,000 FY 2014-15 $5K Material $5K Training
4. Central Safety Committee – Charlie Craig, Chief McArn, Duaime, On Duty SC
5. VAC Committee Report – Duaime Nothing to Report
6. Truck Purchase – Captain Trana
7. Dangerous Building – Captain Miller
8. Pressure Issue – Hose Kinks & Nozzles
9. DOT Study – Captain Buscemi
10. Safety Alerts – Captain Miller

New Business:

1. 1 ¾" Hose line concern - Chief Edwards
2. Workout Injuries
3. Near Miss Process Development
4. SFDSC Secretary – responsible for notes and monthly minutes
5. MSDS Program
6. Ventilation Study Preliminary Findings
7. SC Purpose
8. Committee Needs – Equipment Resources
9. Identify Needed Training – Certificate Programs

Round Table:

1._____

2._____

Action and Follow Up:

1._____

2._____

Next Meeting Date: _____ Adjourn: Prepared by Duaime 9/17/15

Figure #7

NMR Interview Tool:

1. Overall NMR Basics – What are they?
2. What NMR models outside of City of Stockton have your seen work?
3. What are key elements of NMR?
4. What City department is reporting the best?
5. What can SFD do to better injury reporting?
6. As it relates to your area what should SFD do to improve OHS?
7. Additional areas of improvement? (any)