

MANAGING FIRE INVESTIGATION SCENES

**EXECUTIVE ANALYSIS OF FIRE SERVICE OPERATIONS
IN EMERGENCY MANAGEMENT**

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ABSTRACT

This research project explored the feasibility of creating a comprehensive fire investigation procedure to be prepared to provide an adequate response to the need of establishing the cause and origin of all fires. The procedure will assist Douglas County Fire District No.2 (DCFD#2), the members of the Fire Investigation Team (FIT), and all fire suppression personnel during the fire investigation process, and in those instances when responsibilities have to be coordinated with other organizations to successfully resolve a fire under investigation.

The problems to overcome were the lack of a clearly defined policy to assist in determining the steps that must be taken to conduct a fire scene investigation in the most efficient and thorough way possible. The lack of adequately trained staff capable of carrying out the actions necessary to ensure that all aspects surrounding a fire investigation are carried out in a professional and meticulous manner. The lack of knowledge of the protocols and standards that need to be observed to properly conduct the investigation of a fire scene. The lack of measures in place to support the members of the FIT and assist them in dealing adequately with the different phases of a fire investigation. The lack of preparation and resources to adequately investigate large incident scenes, as well as, death or serious injuries resulting from fires. The lack of formal cooperation agreements with any other agencies that can provide professional or technical support in a diversity of disciplines related to fire investigation to assist DCFD#2 fire investigators in managing fire scenes in a proficient manner.

The purpose of this research project was to identify the need for the implementation of a fire investigation procedure. Moreover, it also evaluated the

personnel needs to implement the procedure efficiently, the training needs of the personnel in charge of overseeing or applying the different areas of the procedure, and the operational criteria needed for the procedure to be successful.

It was also the purpose of this research project to identify any other agencies that may have access to resources or expertise not currently available to DCFD#2 to assist in the management of the investigation of fire scenes. The pursuit of cooperation agreements with these agencies would enable DCFD#2 to have access to the resources that can better serve the needs of the department throughout the different steps of a fire investigation.

Descriptive research, including the literature review, was conducted to determine the need for a fire investigation procedure, and the extent and scope of the procedure.

The research questions addressed were:

1. What is our past-experience with the investigation of fire incidents?
2. What are the benefits and limitations of a fire investigation procedure?
3. What should be the scope and purpose of a fire investigation procedure?
4. What should be the key elements of a fire investigation procedure?

The procedures used for this research project included a review of fire service literature, DCFD#2 documents and records, documents from the United States Fire Administration (USFA), and other fire agencies that have fire investigation procedures in place.

The results of this research showed the benefits of implementing a fire investigation procedure. Moreover, it demonstrated that interagency cooperation is a

must for the success of any comprehensive procedure designed to realistically serve the needs of any fire agency in this area.

Recommendations included the adoption of a fire investigation procedure with a comprehensive scope. The definition of the authority and responsibilities that need to be carried out to adequately manage fire scene investigations. Directives for the actions that should be taken by fire suppression crews during the different stages of a fire to assist fire investigators. A description of the actions that need to be taken by the members of the FIT after assuming responsibility for the investigation of a fire scene. A description of the actions to be taken to properly investigate large incident scenes, and deaths or serious injuries resulting from fires. Minimum training or expertise needed by those individuals charged with implementing certain parts of the procedure. Directives for the initiation and maintenance of interagency participation agreements, along with development and adoption of interagency notification guidelines.

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INTRODUCTION

Established in 1947, DCFD#2 is a combination rural fire protection district staffed by 42 career firefighters divided into three shifts, 20 volunteer firefighters and 12 administrative and support staff. The department protects an area of 100 square miles with a population of 37,000 of urban and rural Douglas County in Southern Oregon, including the communities of Dixonville, Green, Melrose, Garden Valley, Umpqua, and the cities of Roseburg, Winchester, and Wilbur. Services are provided from six strategically located fire stations.

During recent years, DCFD#2 has suffered three fatal fires and one major fire incident (DCFD#2 incident report archives). On April 28, 1999, a fire on a doublewide manufactured home resulted in the death of a four-month old male infant that was sleeping in the bedroom next to the area of origin. The grandfather of the infant and an uncle sustained second and third degree burns during the same incident. The fire was caused by an electrical short circuit. On May 10, 2000, a fire on a mobile home resulted in the death of a two-month old male infant that was sleeping on a mattress on the living room where the fire started. Four teenagers, three females and one male also sustained serious first and second degree burns during the same fire. The fire was caused by a candle that was left unattended on the floor of the living room. On January 15, 2001, a three-alarm arson fire gutted the Saint John's Lutheran Church. The fire originated in four different areas of the building, the sanctuary, the administrative offices, the bathrooms, and the multipurpose room. On September 7, 2001, an arson fire that destroyed a two-story single-family dwelling resulted in the death of a sixty-five year old male that was sleeping in a bedroom across from the living room. The fire also forced an

adult female to jump from a window on the second story. She sustained second-degree burns and a broken leg and hand. The fire originated in two different areas of the house, the front porch, and the living room. Although the circumstances surrounding these four fires were somewhat different in nature, they all showed a common denominator, which was the total lack of preparation by the department to handle large or complex fire investigation scenes. DCFD#2 did not have in place at the time of the fires referenced above, a plan to identify which considerations and actions needed to be taken to manage the investigation thoroughly and decisively (DCFD#2 policy manual). The department had no written guidelines addressing the notification of fire investigators, designation of responsibilities for the different tasks that needed to be taken care of, determination of the type of resources that were adequate to manage a fire investigation scene, coordination of fire investigation activities with other agencies, or identification of the different reports and forms necessary for the documentation of an incident by those conducting the investigation (DCFD#2 Procedure Manual). File keeping was limited only to those fire investigations involving arson fires, suspicious fires, and fires which resulted in death or serious injuries. Investigation files were not kept in a chronological order that could have assisted in the retrieval of information, nor were the different documents filed in them. No data was kept from prior incidents that affected DCFD#2 that could have assisted in knowing what had been done in the past in similar investigations, could have helped in identifying potential arson suspects, or could have been used as reference to coordinate the different investigation activities more efficiently.

As a result of the organizational voids in addressing the issues related to the investigation of fire scenes, similar mistakes, oversights and deficiencies have been

repeated every time that DCFD#2 has been faced with any such event over the last several years. With the goal of obtaining the necessary education and information to assist in overcoming the deficiencies of the past, the author attended on September 13, 2001 a conference sponsored by the International Association of Arson Investigators (IAAI) on the Oregon Coast. One of the topics addressed at the conference was “Fire Scene Investigations,” and it covered the organizational aspects and resources that need to be in place for the successful investigation of fires. The training provided ample information and sources to assist in developing a comprehensive program to provide an effective response during those instances in which a fire scene needs to be investigated. The different areas that were identified during the training as vital components for the management of any fire scene investigation were: preservation of the fire scene, fire investigators notification, internal and interagency support, availability and adequacy of resources available to investigators, investigation protocols, and incident documentation.

The importance of having a fire investigation procedure is described by Dr. John C. Hitt, President of the University of Central Florida (UCF):

I encourage interested and concerned public safety personnel to use *Fire and Arson Scene Evidence: A Guide for Public Safety Personnel*. The procedures recommended in the *Guide* can help to ensure that more investigations are successfully concluded through the proper identification, collection, and examination of all relevant forensic evidence. (2000, p. 5).

The significance of developing and adopting comprehensive fire investigation protocols is also addressed by Janet Reno, Attorney General of the U.S. Department of Justice, Washington, DC:

While many agencies have programs in fire and arson scene processing, the level of training and resources available varies from jurisdiction to jurisdiction, as does the opportunity to practice actual investigation. To assist these agencies, the National Institute of Justice (NIJ) convened a group of law enforcement and legal practitioners, as well as expert fire investigators, to develop improved procedures for the investigation and collection of evidence from fire and arson scenes. (2000,p. 3).

The lack of provisions to deal with fire scene investigations is a common issue affecting many fire agencies across the country. The nature of our job leads us to worry and care for others, and to put most of our fire protection efforts in the control of fires by the members of the fire suppression division to minimize the potential for loss of life and property damage. However, many agencies are so immerse in the concept of reducing the community fire risk through effective fire suppression that fail to recognize the complexities of what constitutes an adequate fire protection delivery system. They fail to understand that effective community fire protection in itself requires a systematic approach that involves the use of a wide range of fire protection activities such as fire suppression, fire investigation, public education, and code enforcement. More specifically, regarding the investigation of fires, they fail to prepare adequately for those occasions in which proper management of the fire scene through sound investigative methodology, adequate resources, and the pertinent level of technical support become

crucial to determine the cause of a fire. They misunderstand the need to learn the causes of fires, and develop the knowledge necessary to assist in the implementation of fire prevention measures and public education programs capable of decreasing their number and severity, and effectively protect the community.

The use of the guidelines provided by the International Fire Service Training Association (IFSTA) to give fire fighters a basic knowledge of their fire investigation responsibilities at fire scenes, the NIJ to develop procedures for fire and arson investigation that can be applied at different levels, and the USFA to facilitate fire investigation management and arson control were deemed to be the best foundation for the implementation of a successful fire scene investigation management procedure.

The ideal procedure should be tailored according to the specific organizational needs and limitations of DCFD#2 and must be revised periodically to ensure its continued adequacy. The scope of the procedure shall be comprehensive in nature, and must include the following areas: management of fire investigation scenes during emergency operations, documentation of fire scenes, evaluation of fire scenes, community fire risk assessment, available fire investigation capabilities, disclosure of information regarding fire investigations, and fire investigation scene coordination and communications.

The purpose of this research project is to help DCFD#2 to better prepare for and deal with incidents requiring the investigation of fire scenes of different magnitude.

The different areas of the procedure shall included when applicable the following elements: fire investigation actions to be taken by fire suppression personnel, activation of the FIT, adopted fire investigation documentation forms, processing of fire scenes,

collection and preservation of evidence, fire investigation capabilities of the FIT, available fire investigation resources, disclosure of information regarding fire investigations, release of fire investigation reports, coordination of fire investigation activities, agencies to be notified when arson or fatal fires occur, and the releasing of fire scenes.

As part of the support structure of its procedure, DCFD#2 should provide the necessary technical and material resources to support the investigative efforts of the FIT and help them in the determination of the exact cause and origin of fires. The department should provide the necessary support to fire investigators and encourage their participation and commitment to the FIT by arranging for the necessary shift coverage when they are participating on a fire investigation or attending related training out of the jurisdiction. The department should also assist FIT members by allocating the necessary funds on the budget to support fire investigation related needs such as extra duty pay, transportation and lodging, financial needs, and other needs that may surface during a fire investigation or may be brought to the department's attention.

Descriptive research, including literature review, was conducted to determine the need for a procedure for the management of fire investigation scenes, and to determine the scope of the procedure. Several documents and procedures were examined to gather a sufficient base of data that could assist in developing a procedure capable of addressing the planning needs that could meet the overall goal of been better prepared for and capable of dealing with incidents requiring the investigation of fire scenes.

The research questions addressed were as follows:

1. What is our past experience regarding the management of fire investigation scenes?
2. What are the benefits and limitations of a procedure for the management of fire investigation scenes?
3. What should be the scope and purpose of a procedure for the management of fire investigation scenes?
4. What should be the key elements of a procedure for the management of fire investigation scenes?

BACKGROUND AND SIGNIFICANCE

Established in 1947, DCFD#2 is a combination rural fire protection district staffed by 42 career firefighters divided into three shifts, 20 volunteer firefighters and 12 administrative and support staff. The department protects an area of 100 square miles with a population of 37,000 (Douglas County Surveyors Office, personal communication, December 22, 2001) of urban and rural Douglas County in Southern Oregon, including the communities of Dixonville, Green, Melrose, Garden Valley, Umpqua, and the cities of Roseburg, Winchester, and Wilbur. Services are provided from six strategically located fire stations. The equipment operated consists of seven engine companies, three Advanced Life Support (ALS) ambulances, one rescue company, one truck company, seven brush companies, four water tenders, one air unit, and two water rescue boats.

During 2001, DCFD#2 responded to 137 fires; 1,354 Emergency Medical Services (EMS) calls; 12 rescue calls; 25 hazardous materials emergencies; and 674 other type incident calls.

Access to DCFD#2 is accomplished via four major highways, railway (cargo only) and the Roseburg Regional Airport. The community is rural residential at large, with housing in secluded and residential areas. The main economic resource of the area is provided by the timber industry, along with some light industry, small business, farming and tourism. There are twenty-one major assembly occupancies, eight public and private schools, one community college, one museum, and one car racetrack within the jurisdiction. Tourism industry blooms year round in this rural area with excellent fishing and white water rafting opportunities along the North and South Umpqua rivers,

endless hiking trails along the wilderness areas, and great cross country skiing along the majestic mountains that form Crater Lake National Park.

DCFD#2 had no provisions to effectively manage fire investigation scenes involving death or injury, or large incidents prior to 1999 (DCFD#2 policy manual). Despite the obvious lack of preparedness, and organization of duties and responsibilities that surrounded the investigation of the fatal fire on April 1999, no action was taken to plan for and organize a coordinated response to deal effectively with future incidences of the same nature. The lack of vision in applying the lessons learned in 1999 resulted again at the time of the fatal fire on May 2000, the multiple alarm church fire on January 2001, and the fatal fire on September 2001, in a situation in which the department needed to manage complex fire investigation scenes properly to determine the cause and origin of the fire, but was not prepared to undertake this commitment in a proper manner in such intense moments. Moreover, the fact that no procedure was yet in place and that no accurate records of the actions taken in 1999 were maintained further prevented a consistent and efficient handling of the subsequent incidents.

Some steps taken to date to properly cope with the impact of incidents like those referenced above have been special training for the members of the FIT in preparing for the investigation of fatal or arson fires. The adoption of standardized forms for documenting the investigation of fire scenes in an organized manner, such as, those from *NFPA 906: Guide for Fire Incident Field Notes*, which includes the following: case supervision, any fire, structure fires, motor vehicle fires, wildland fires, casualty fires, witness statement, evidence log, photograph log, incident sketch, insurance information, and other relevant records pertaining to fire investigation. Participation in the Douglas

County Fire Investigation Task Force (DCFITF), which is dedicated to bringing together fire service agencies, the law enforcement community, and the insurance industry to facilitate the availability of the resources necessary to properly manage a wide array of fire investigation scenes. The adoption of a standardized filing system for all records resulting from the investigation of fire scenes. The pursuit of working partnerships with the Douglas County District Attorney's Office (DCDAO), the Oregon State Police Arson/Explosives Section (OSPA/ES), the Douglas County Sheriff's Office (DCSO) and several other agencies that can provide the professional support, and the technical assistance needed to manage fire investigation scenes involving death or injury, arson, or large incidents in a proficient manner has also been initiated.

This research project was completed in accordance with the applied research requirements of the Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) course of the National Fire Academy's Executive Fire Officer Program (EFOP). The problem and its associated issues are related to several of the concepts covered during the EAFSOEM course. The emergency management areas of fire service operations referenced as part on the EAFSOEM course are particularly relevant because to achieve the desired preparation for the management of fire investigation scenes of any magnitude and complexity, DCFD#2 needs to analyze the extent of the problem derived from the lack of provisions to deal with the investigation of fire scenes. It needs to formulate a plan tailored to overcome the existing deficiencies that prevent the successful management of fire investigation scenes. It needs to develop and implement the necessary measures to prepare for and provide the necessary guidance for the effective management of fire investigations. Moreover, it needs to frequently

monitor the implemented elements of the plan and make the necessary revisions to ensure that they are constantly meeting the needs and expectations of the department. The research project follows the EAFSOEM course instructions regarding how to effectively prepare in the different areas necessary to manage the elements needed to conduct a thorough and proficient fire scene investigation.

LITERATURE REVIEW

The literature review for this project comprehended the following areas: (1) a review of available data reflecting the extent of the need for the organized investigation of the cause and origin of all fires; (2) the importance of fire investigation procedures; (3) issues affecting the investigation of fire scenes; and (4) the purpose of interagency partnerships. The literature review to obtain information related to the above referenced topics comprehended a search of fire service magazines, journals and textbooks. Moreover, input was sought in some of the related areas from experts at the IAAI, the OSPA/ES, and at the International Fire Marshals Association (IFMA).

Data Analysis

Bryan and Picard (1979) wrote that the first phase mentioned above is essential to the success of the effort. Under the most adverse conditions, no fire loss facts and figures are available in the jurisdiction. While this is the exception rather than the rule, such situations do exist. Without adequate records, it is difficult for the task force to begin to identify the problem. A better grasp of the problem is possible if records are kept of all fires and their causes (p. 270).

Karter (2000) wrote that in 1999, incendiary or suspicious structure fires also resulted in \$1,281 million in property damage. This represents 15.1 percent of all

structure property loss (p. 84).

Badger (2001) wrote that last year in the United States, 1,708,000 fires caused an estimated \$11.2 billion in direct property loss. Many of these were small fires that did little or no property damage. However, 61 of them resulted in losses of \$5 million or more each. Together these large loss fires resulted in \$2 billion in direct property damage, killed 11 civilians, and injured 111 civilians and 62 firefighters. And despite that they represented only 0.004 percent of all the fires estimated to have occurred in the United States last year, they accounted for 17.9 percent of the estimated dollar loss (p. 58).

The literature review indicated that according to the *National Fire Protection Association (NFPA) 2000 United States Fire Loss Report*, The largest number of civilian deaths last year occurred in residential properties, were an estimated 3,445 people died. This represents a significant increase of 18 percent over the year before. Of these, 500 deaths occurred in apartment fires and 2,920 occurred in one-and two-family dwellings. This represents a decrease of 3.8 percent in apartment fires from the year before, but a significant increase of 22.9 percent, or 545 deaths, in one-and two-family home fires. In fact, this is a return to 1997-1998 levels (Karter, 2001, p.82).

According to the *Oregon State Fire Marshal 2000 Annual Report*, statewide when looking at places of fire origin in residential structures in 2000, the most common place in a home for a fire to start continued to be the kitchen. There were 793 kitchen fires, which equals 22% of the residential fires reported. The second leading area was the chimney with 418 fires. The remaining top three locations included the bedroom with

371 fires, the living room with 368, and the garage with 182 fires. These fires represent 60% of all residential fires reported in 2000 (Garrison, 2001, p. 7).

The available data reveals an alarming high number of fires resulting in large losses, it also reveals that most fire deaths and injuries are the result of fires that occur in residential type properties. This leads to the conclusion that no fire agency regardless of its size and composition is immune at any time from a tragedy of this type. It also illustrates the need to determine the cause and origin of all fires through fire investigation to gain the knowledge necessary to implement the desired fire prevention measures to curve the fire problem.

Existing Firefighter Investigation Procedures

Hewitt (2000) states that in 1992, NFPA published the first edition of NFPA 921, *Guide to Fire and Explosion Investigations*, representing the first major integration of science, engineering, and fire investigations. One of NFPA 921's primary purposes was "to provide guidance to investigators... based on accepted scientific principles or scientific research" (p. 42).

Herrera (1999) wrote that when collecting and preserving evidence, consistency, in the form of a standard operating procedure, is very important. Standard operating procedures based on applicable laws and proven facts are those most likely to hold up under scrutiny (p. 31).

Available data from the Douglas County Fire Chiefs Organization (DCFCO) archives showed that none of the 36 fire agencies operating in Douglas County had in place guidelines to provide them with a clear indication of what needed to be done to manage a fire investigation scene. (DCFCO archives, 2001).

Rubin (2001) explains that the expected duties of the various assigned positions should be recorded in a standard operating procedure (SOP). Organizational training must be held so that the members who are asked to fill positions understand their responsibilities. (p. 124).

The available data reveals the need for a consistent approach to fire investigation by all fire service agencies. In order to address the complexity associated with the investigation of fire scenes, fire agencies must confront the management challenge of the investigation process in a proactive way through the adoption of comprehensive fire investigation procedures. The data also shows that most fire agencies lack policies and procedures that can guide their actions during the different facets of a fire investigation.

Issues Affecting the Management of Fire Investigation Scenes

Thrapp (2000) explains that Oregon law requires fire departments to determine the causes and origins of all reported fires. When these are not obvious to fire crews, it becomes the responsibility of the Fire Marshal's Office to investigate. By knowing how fires start, we are better able to prevent future losses and, if necessary, successfully prosecute arsonists (p. 2).

Carter (2001) wrote that to protect itself and its members, the organization must set down, in writing, the ways in which it intends to do business, so that all personnel can operate to a common denominator; similar rules and uniform procedures. (p. 74).

Comeau (2001) stated that one reason the state attorney's office gave for the low prosecution rate was the inconsistency in the way different agencies and departments investigated fire scenes. Because so many cases relied on circumstantial evidence, the state attorney's office needed to bolster its prosecution with physical evidence, which had

to be collected in such a manner that it wouldn't be thrown out during the trial. The inconsistencies in investigation created questions about the strength of many cases and doubts as to whether they would stand up in court (p. 66).

Hewitt (2000) reveals that fire and explosion investigators in the United States are facing new challenges when it comes to testifying in court. Not only do lawyers regularly use fire investigation guidelines and standards to dispute the investigator's opinions, but new interpretations of scientific evidence admissibility rules are leading to new ways of attacking expert testimony (p. 42).

Robertson (2000) states that there is a need for more qualified fire investigators in the field and thorough training in investigative techniques to discover and preserve evidence of arson that will hold up in the courts (p. 205).

The available data indicates that issues affecting the management of fire investigation scenes are mainly of four types. The first type covers the need for the quick resolution of the cause and origin of fires to assist in the identification of fire trends, in the development of appropriate fire prevention measures, and in the fight against arson. The second type has a somewhat more ample scope, and covers the need for an organized approach to the different fire investigation responsibilities, documentation of fire scenes, and the analysis of the capabilities available to fire agencies to conduct the investigation of fire scenes in accordance with nationally recognized standards. The third type addresses the issue of courtroom testimony, and the controversial application by lawyers in the courtroom setting of the *NFPA 921 Guide For Fire and Explosion Investigations* during cross examination to refute any conclusions regarding the cause of a fire presented by fire investigators when testifying in court. Finally, the fourth type has to do with the

need for specialized training in all the different disciplines related to the investigation of fires to allow investigators to gain the experience and proficiency necessary to become efficient fire investigators.

Purpose of Interagency Partnerships

In 1998, Elliot wrote the following about partnerships:

I seldom go to a meeting lately without hearing the words “partnership” or “network.” It seems teamwork is the phenomenon of the 90’s. With budgets shrinking, employees must do more with less and the ability to combine resources is the key to success. Of course, networking has its price too-long hours sitting around a table discussing strategies for problem solving and, lets not forget my favorite, the small group break-out session. I’ve come to wonder if all this networking is really helping or if it’s just a way to eat doughnuts three times a week (p.6-7).

In 1979, Bryan and Picard wrote that a determination needs to be made as to the relationship that should exist between the arson investigation unit (as described earlier in this chapter) and other agencies within the municipality, particularly the fire and police departments. An atmosphere of mutual respect must be developed between the arson unit and combat firefighters, as their assistance and cooperation are necessary if the investigation is to be successful (p. 286).

The investigation of fatal fires, and arson or large incidents will often overcome the capabilities of a single fire agency. It is in these moments were the cooperation and support offered by other public agencies or private groups that posses a specific expertise or have access to specialized resources will proof to be invaluable. Fire agencies must

develop partnerships with a broad range of professionals that are dedicated to assisting each other during times of need.

PROCEDURES

The research for this project was conducted through several avenues including literature review, and personal interviews.

Literature Review

A review of available literature was initiated at the National Fire Academy's (NFA) Learning Resource Center (LRC) in August 2001. Additional searches were conducted at the Douglas County Library in Roseburg, Oregon. Umpqua Community College library in Winchester, Oregon. OSFM Community Education Resource Library in Salem, Oregon. DCFD#2 Fire Prevention Bureau (FPB) library, and the author's personal library.

The literature review concentrated on trade journals, magazines, manuals, textbooks, and statistical reports that contained information regarding the extent of the fire problem in the United States and in Oregon, the importance and purpose of comprehensive fire investigation procedures, issues affecting the investigation of fire scenes, and interagency partnerships.

Personal Interviews and Correspondence

Written requests for information and telephone and personal interviews were conducted with experts in various applicable areas between September 2001 and February 2002.

Mr. Roger Parker, Fire Marshal of the South Metro Fire and Rescue Fire Department in Colorado, was interviewed on October 14, 2001. Mr. Parker offered a

perspective on some of the guidelines adopted by his agency to assist in the management of fire investigations.

A personal interview with Mr. Jay Tappan, Fire Marshal of the Saint Helens Fire Department, was conducted on October 19, 2001, while the author attended a meeting of the Oregon Fire Marshals Association (OFMA) at the Office of State Fire Marshal in Salem, Oregon. Fire Marshal Tappan assisted in answering questions relative to the different areas that a fire scene investigation procedure must include.

A personal interview with Mr. Robert Wright, Supervising Deputy State Fire Marshal for Douglas, Coos and Jackson Counties was conducted at his office in Roseburg, on November 12, 2001. Deputy Wright assisted in answering questions relative to the different actions that need to be taken to overcome the lack of planning and preparation needed for the successful management of fire investigations. He also commented on what were some of the legal issues that should be considered when developing a fire investigation procedure.

Mr. Robert Banks, Fire Marshal of the Woodburn Fire District in Woodburn, Oregon was interviewed on November 19, 2001. Follow-up written correspondence was also conducted with Fire Marshal Banks on December 7, 2001. Fire Marshal Banks offered an insight into the comprehensive fire investigation guidelines adopted by the Marion / Polk County Fire Investigation Team.

Ms. Shannon Thorson, President of the OFMA in Oregon, was interviewed in January 8, 2002. Ms. Thorson informed the author that no formal procedure has been adopted to date by the Fire Marshals organization, which could provide a structured guidance for the management of fire investigation scenes.

Written correspondence and requests for information were also made to several fire agencies within Oregon including the McMinnville Fire Department, Gresham Fire Department, Bend Fire Department, Jackson County Fire District No.3, Cottage Grove Fire Department, Klamath County Fire District No.1, Corvallis Fire Department, and the OSFM. All of the organizations responded; however, many did not have any procedures or formal guidelines in place to provide an organized approach to the investigation of fires. Others provided leads to other literary sources to assist the author with this project.

Limitations

An anticipated limitation of the research was the lack on the part of DCFD#2 of any previous procedure that contained provisions that indicated the necessary steps to follow during the investigation of fire scenes. Also anticipated was the lack of an accurate fire investigation case documentation filing system that could have provided the historical data necessary to know what had been done in the past to manage the investigation of fatal or large fires, and could have been used as reference source. The lack of clearly defined guidelines and data limited the ability of the author in obtaining specific rather than generic information that could assist in the accurate evaluation of the problem and subsequent development and implementation of a procedure.

Another limitation was the lack of an established fire scene investigation procedure in any of the fire agencies neighboring DCFD#2. Therefore, eliminating the possibility on the part of the author to tap into an already established base of knowledge that could assist in learning about the essential components of a fire investigation procedure and the issues affecting its performance and objectives.

The fact that most of the fire agencies in Oregon do not have guidelines to facilitate the management of fire scenes under investigation, and that no guidance exist from the major fire service players in the state like the Oregon Fire Chiefs Association (OFCA), and the OFMA, for the adoption of a similar guideline on a state wide basis, resulted in further limitations to the research.

The research project was also limited by time. The six-month time frame given by the NFA for the completion EFOP applied research papers did not allow a more extensive review of available literature and documents.

Definition of Terms

The following definitions are used by the Douglas County Fire Chiefs Organization (DCFCO), the Office of State Fire Marshal (OSFM), the national Fire Academy (NFA), and the National Fire Protection Association (NFPA). It is the purpose of these definitions to serve as common language and to favor the exchange of ideas and information amongst fire service professionals.

Arson. The crime of maliciously and intentionally, or recklessly, starting a fire or causing an explosion.

Death. To be included in fatality statistics, a death must be the result of an injury that occurred during a fire and that was fatal within one year.

DPSST. The Department of Public Safety Standards and Training in Oregon

DCDAO. The Douglas County District Attorney's Office

DCEC. The Douglas County Emergency Communications Center

DCFCO. The Douglas County Fire Chiefs Organization

DCFD#2. Douglas County Fire District No.2

DCFITF. The Douglas County Fire Investigation Task Force

DCSO. The Douglas County Sheriff's Office

EFOP. The Executive Fire Officer Program offered at the National Fire Academy.

EAFSOEM. The Executive Analysis of Fire Service Operations in Emergency Management portion of the national Fire Academy's Executive Fire Officer Program.

FEMA. The Federal Emergency Management Agency

Fire Investigation. The process of determining the origin, cause, and development of a fire or explosion.

Fire Investigator. An individual knowledgeable and trained in fire origins and growth aspects who determines fire causes and the possibility of malicious intent to ensure that the due processes of law are enforced.

FIT. The Douglas County Fire District No.2 Fire Investigation Team

Fire. Any instance of uncontrolled burning, including combustion, explosions, and fires that are out when the fire department arrives.

Fire Cause. The predominant and contributory reason(s) why an unwanted fire occurs.

Fire Prevention. Measures directed toward avoiding the inception of fire

FPB. The Fire Prevention Bureau of Douglas County Fire District No.2

Fire Suppression. Firefighting activity concerned with controlling and reducing a fire prior to its actual extinguishment.

IFMA. The International Fire Marshals Association

Injury. Any physical damage a person suffers that requires treatment by a

medical practitioner within one year of the incident, or that results in at least one day of restricted activity following the incident.

IAAI. The International Association of Arson Investigators

ICS. Incident Command System

IFSTA. The International Fire Service Training Association

LRC. The Learning Resource Center located at the campus of the National Fire Academy.

NFA. The National Fire Academy

NFPA. The National Fire Protection Association

NIJ. The National Institute of Justice

OFCA. The Oregon Fire Chiefs Association

OFMA. The Oregon Fire Marshals Association

ORS. The Oregon Revised Statutes

OSFM. The Oregon Office of State Fire Marshal

OSPA/ES. The Oregon State Police Arson/Explosives Section

O UFC. The Oregon Uniform Fire Code

SMOC. The Strategic Management of Change portion of the National Fire Academy's Executive Fire Officer Program.

SOP. Standard Operating Procedure

TWGFASI. The Technical Working Group on Fire/Arson Scene Investigation

UCF. The University of central Florida

USFA. The United States Fire Administration

RESULTS

1. *What is our past experience regarding the management of fire investigation scenes?*

The impact of the fires involving deaths and injuries, and the large arson fire in a church building experienced by DCFD#2 in recent years has clearly demonstrated that the department is unprepared to provide an organized response to the fire investigation challenges posed by these fires. The experience left by the last three fatal fires that occurred within the jurisdiction as shown that the lack of preparedness of the FIT to properly manage the investigation of such fire scenes as resulted in the repetition of inadequacies, mistakes, and oversights in every occasion, and in the failure to coordinate the activities necessary to establish the cause of the fires in an efficient way. Moreover, the experience provided by these fires as clearly shown the need to analyze, plan for, and adopt the desired measures to provide the necessary guidance for the efficient management of fire investigation scenes.

The available data suggests that despite the large number of fatal fires and arson fires that occur every year in the United States, there are only a handful of agencies that are prepared and have the necessary procedures in place to assist them in managing the investigation of these tragic incidents.

2. *What are the benefits and limitations of a procedure for the management of fire investigation scenes?*

A research of the fire and arson scene investigation guides developed by the Technical Working Group on Fire / Arson Scene Investigation (TWGFASI),

and by fire agencies and organizations across the country, indicates that careful preparation, and adoption of a comprehensive fire investigation protocol will prove to be invaluable in providing the guidance needed to properly investigate fire scenes and establish the cause of fires.

DeHaan (1997) stated that by accurately and efficiently identifying the causes of fires, whether they are accidental or incendiary, investigators could make a real and substantial contribution to reducing these terrible losses (p. 2).

Robertson (2000) explains that a systematic examination of the fire scene is all-important in establishing the origin of the fire, whether accidental or not (p. 205).

The limitations of a procedure for the management of fire investigation scenes were found to be the lack of vision in evaluating all incidents and incorporating the lessons learned to the existing procedure; and the failure to dedicate the necessary effort to ensure that the procedure adopted considers realistically all the elements influencing the investigation of fire scenes, and the capabilities needed to handle them properly.

3. *What should be the scope and the purpose of a procedure for the management of fire investigation scenes?*

The research reveals that the scope of most fire scene investigation procedures adopted by fire agencies are of a comprehensive nature. The procedures contemplate all situations that should be taken into account and the responses that can be necessary given the specific structure and resources of the organization.

The research also revealed that the main purpose of most of the procedures and guidelines adopted by fire agencies regarding this matter is to identify the duties and responsibilities to be carried out during a fire investigation, and to serve as a guide to coordinate the different activities that need to occur to successfully manage the fire investigation scene.

DeHaan (1997) wrote that the analytical approach to fire investigation to be discussed here extends not only to the review of the entire case but also to the examination of the scene, where patient, thorough, and systematic evaluation of the remains will usually pay off in information critical to the case (p.5).

4. *What should be the key elements of a procedure for the management of fire investigation scenes?*

The research shows that although different nomenclature is used by different agencies to describe the areas and elements that should be included in a fire scene investigation procedure, and that the order in which they are listed varies, that most of the procedures evaluated have common areas and elements such as: role of fire suppression personnel in fire investigation, role of the fire investigation team personnel in fire investigation, interaction between fire investigators and other resource agencies, scene security and control, interview of witnesses, processing of fire scenes, preservation and handling of evidence, documentation of fire scenes, and generation of required fire incident and fire investigation reports. These areas and elements reflect the things that need to be done in order to manage fire investigation scenes in a thorough and efficient manner.

Carter (2001) wrote would you ever consider starting out on a long journey to a faraway location without a road map? I don't think so. Just as you would need a map to guide you on a trip through some strange and unfamiliar territory, so then is a policy book your guide through the world of organizational operations (p.74).

DISCUSSION

The literature search revealed the need for the implementation of the necessary measures to assist in managing fire investigation scenes in an organized way. The research also revealed the need to maintain accurate files and documentation of all fires investigated for a wide variety of reasons. Furthermore, it showed that interagency assistance is a key element in obtaining and benefiting from the expertise and resources that are beyond the availability and capabilities of a single agency or organization.

Interpretation

The research indicated that there is currently a need for the development and implementation of a procedure that can assist DCFD#2 in managing effectively and efficiently the investigation of all fires that occur within the jurisdiction. The provisions currently in place are limited to the information contained in the procedure implemented on 1996 for the activation of the members of the FIT, and the use of the Incident Command System (ICS) for the management of all fire scenes, in which the FIT operates as a Group under the supervision of the Fire Marshal (Group Supervisor) to conduct the investigation of fire scenes. The research showed that procedures like the ones adopted by the Rochester Fire Department, in New York, and Klamath County Fire District No.1, in Oregon, were adequate models to set the foundation for the development of a

procedure to facilitate managing fire investigation scenes with the efficiency they deserve. It is the opinion of the author that the extent of the planning to be done and the information to be collected during the process of creating a similar procedure will enable DCFD#2 to accurately evaluate the depth of the problem, and facilitate the adoption of the necessary measures to successfully manage fire investigation scenes.

The research demonstrated that fire investigation guidelines with a proactive focus such as the ones developed by the U.S. Department of Justice and the NFPA can assist in identifying the needs and the resources that need to be in place at the time of a fire investigation. The guidelines referenced above go through each of the different aspects and situations that need to be taken into consideration during a fire scene investigation, and determine beforehand the strategy best suited to handle the investigation process in the most effective way. They also evaluate the composition and capabilities of the organization, thus obtaining a broad picture that enables them to determine the partnerships and contacts with other organizations that should be pursued to obtain the necessary assistance and resources for every case. The author believes that the fire investigation procedure adopted by DCFD#2 should be a user-friendly tool dedicated to the assistance of all the department members during a fire scene investigation. This tool should assist them in evaluating what is the appropriate course of action in accordance with the situation at hand. It should also be the basis for any action that DCFD#2 personnel will undertake to manage a fire scene investigation.

The research clearly indicates that interagency partnerships between professionals from different disciplines and agencies of different characteristics, such as the one existing between the Oregon Fire Service and the State Farm Insurance Group, are

successful in solving problems that often times are beyond the financial reach or capabilities of a single resource agency.

The research also demonstrated that there is a need for the adoption of a state-wide protocol with a common language that can assist in bringing together the knowledge accumulated by different agencies in the management of fire investigation scenes for the benefit of the fire service community. The adopted protocol shall also include the establishment of a network for the sharing of the different areas of expertise and resources available throughout the state.

RECOMMENDATIONS

Based on the research conducted, the following recommendations are made:

1. It is the recommendation of this author that DCFD#2 proceed with the development and the adoption of a comprehensive fire investigation procedure that could be implemented to guide the actions of the department and its members during the management of fire investigation scenes. In other words, the procedure should clearly define which actions are to be taken and by whom, to adequately manage fire investigation scenes of different degree of complexity.
2. Further research need to be conducted to determine the assistance that may be needed in the event of a fire investigation involving large incident scenes, as well as, death or serious injuries, and to identify the agencies, groups or individuals that are capable of providing this assistance at a moments notice. The agencies, groups or individuals that agree to render their assistance along with their specific fields of expertise or capabilities need to be listed in a resource directory. The

- resource directory should become an appendix to the protocol, and must be updated with the same frequency.
3. Adequate training should be provided to all personnel that may be charged with specific responsibilities to assist in the management of a fire investigation scene. All personnel shall also become familiar with the provisions of the procedure for fire investigation, in order to facilitate an adequate handling of the investigation of fire scenes by promoting coordinated responses at an organizational level, rather than isolated actions at an individual level. Furthermore, the author would like to encourage all the FIT members in the department to pursue nationally recognized fire investigator certification through accredited training sponsored by the NFA, the IAAI, and the NFPA, in order to meet the desired professional requirements that demonstrate the skills and competency of qualified fire investigators.
 4. Finally, in order to develop a comprehensive procedure that can meet all of the needs and demands that occur during the investigation of a fire scene, the author would like to recommend that the adopted procedure include the following areas:
 - Investigation responsibilities
 - Investigation duties of the Incident Command Officer
 - Investigation duties of fire suppression personnel
 - Investigation duties of the fire investigators
 - Investigation duties of the Fire Marshal
 - Fires to be investigated by fire suppression personnel
 - Fires to be investigated by the Fire Investigation Team

- Fires requiring notification to the Fire Marshal
- Requests for fire investigators

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APPENDIX A

Sample Fire Investigation Procedure

The fire investigation procedure adopted by DCFD#2 should cover the sections, subsections, and elements referenced herein to ensure that all details pertaining to the management of a fire investigation scene are addressed in a proper and timely fashion.

DOUGLAS COUNTY FIRE DISTRICT NO.2 PROCEDURE MANUAL

DIVISION: FIRE PREVENTION

SECTION: 7.8

SUBJECT: FIRE INVESTIGATION

PURPOSE

The purpose of this procedure is to implement district policy number 7.8 and to establish general guidelines for the managing of all fire investigation scenes within the jurisdiction of Douglas county Fire District No.2 (DCFD#2), so as to determine the cause, origin, and circumstances surrounding a fire incident. Fire investigation is a key component of DCFD#2 overall fire prevention program. The information gathered during the fire investigation process provides the basis for the development of pertinent public safety measures or programs in the areas of engineering, code enforcement, and public education.

SCOPE

The guidelines described in this procedure shall be applicable to all DCFD#2 personnel to the extent of their responsibilities, as well as, the purpose and scope of their duties (fire suppression, incident command, fire investigation, etc.)

PROCEDURE

7.8 FIRE SCENE INVESTIGATION

7.8.1 INVESTIGATION RESPONSIBILITIES

7.8.1.1 The authority and responsibility by which all DCFD#2 personnel shall investigate all fires is described under the provisions of Oregon Revised Statutes (ORS) 476.030 and 476.060, under the provisions contained in Article I Administration of the Oregon uniform Fire Code (OUFC), and ultimately under the authority delegated to any member of the Fire District by the Fire Chief, for the investigation of fires in accordance with this procedure.

7.8.1.2 All safety procedures adopted by DCFD#2 shall be observed when conducting fire scene investigations.

7.8.1.3 A minimum of two personnel shall be assigned to all fire investigation scenes to provide for an adequate level of safety, and thoroughness during the investigation process.

7.8.2 INVESTIGATION DUTIES OF THE INCIDENT COMMAND OFFICER

7.8.2.1 The Incident Command Officer shall be responsible for conducting the following fire investigation duties:

- Initially investigate all fires to determine the area of origin and possible cause of the fire.
- Preservation of the area of origin and potential evidence during fire suppression, salvage, and overhaul operations.
- Provide an estimate of the fire loss
- Coordination of news releases with media crews present at the fire scene
- Request the duty fire investigators when any of the circumstances described under the guidelines of section 7.8.3 of this procedure apply.
- Notify the Fire Marshal when any of the circumstances described under the guidelines of section 7.8.4 of this procedure apply.
- Provide personnel and equipment as needed by FIT personnel to conduct the fire investigation.
- Coordinate with the fire investigator in charge prior to leaving scene to exchange all pertinent information regarding the incident.

7.8.3 INVESTIGATION DUTIES OF FIRE SUPPRESSION PERSONNEL

7.8.3.1 Fire Suppression personnel shall be responsible for conducting the following fire investigation duties:

- Observation of fire and smoke behavior
- Observation of factors contributing to the fire or hindering fire suppression
- Preservation of the scene
- Identification and preservation of possible evidence
- Identification and of all parties concerned with the incident
- Initial determination of the area of origin and cause of the fire
- Completion of all applicable incident reports
- Assist FIT personnel as directed
- Coordinate with the fire investigator in charge prior to leaving the scene to exchange all pertinent information regarding the incident.

7.8.4 INVESTIGATION DUTIES OF THE FIRE INVESTIGATORS

7.8.4.1 Fire Prevention Officers and Fire Investigation Team personnel shall be

responsible for conducting the following fire investigation duties:

- Coordinate fire investigation activities with the Incident Command Officer
- Assess and establish the extent of the fire scene
- Establish and enforce scene control
- Request additional fire investigators as needed
- Debriefing of initial fire suppression crews at the scene
- Identification and interview of owners and occupants
- Identification and interview of witnesses
- Determination and request of any additional resources needed to process the fire scene.
- Notification to pertinent authorities when investigating arson fires, fires involving death or injury, requiring pre-hospital care or transport to a hospital, explosions of any type, any time a large fire loss occurs (damages in excess of \$1,000,000)
- Processing of the fire scene
- Documentation of the fire scene (photos, video, diagrams, etc.)
- Identification, collection, preservation, and disposition of evidence
- Identification and interview of potential suspects
- Completion of applicable fire investigation reports
- Notification of the Fire Marshal when applicable as required under section 7.8.2.1 of this procedure.

7.8.5 INVESTIGATION DUTIES OF THE FIRE MARSHAL

7.8.5.1 The Fire Marshal shall be responsible for conducting the following fire investigation duties:

- Coordinate fire investigation activities with the Incident Command Officer
- Debriefing of FIT personnel already on scene
- Assign fire investigation responsibilities to FIT personnel
- Coordinate fire investigation activities with other pertinent agencies
- Authorize the release of the fire scene
- Approve all applicable fire investigation reports prior to filing
- Debriefing of the FIT
 - a) Evaluation of the investigation process
 - b) Revision of applicable procedures
 - c) Evaluation of cooperation with fire suppression personnel
 - d) Evaluation of cooperation with other agencies, groups or individuals
 - e) Recommendation and implementation of appropriate corrective measures

7.8.6 FIRES TO BE INVESTIGATED BY FIRE SUPPRESSION PERSONNEL

7.8.6.1 Fire suppression personnel shall under the supervision of the Incident Command Officer or the Company Officer initially investigate all fires to determine the area of origin, the source of ignition, and their cause. When these ignition factors can not be

identified by responding fire suppression personnel, the duty fire investigators shall be requested to the scene.

7.8.7 FIRES TO BE INVESTIGATED BY THE FIRE INVESTIGATION TEAM

7.8.7.1 The members of the FIT shall be responsible for the investigation of fires when one or more of the following apply:

- Area of origin and fire cause can not be determined by responding fire suppression personnel.
- Suspicion or evidence of firesetting
- There is more than one fire in the same immediate area
- It is reported that valuables are missing from the fire scene
- Fires set by juveniles
- Fireworks related fires
- Any type of incident that would require notification to the Fire Marshal

7.8.8 FIRES REQUIRING NOTIFICATION TO THE FIRE MARSHAL

7.8.8.1 The Fire Marshal shall be notified, and shall assume the command of fire scene investigations when one or more of the following apply:

- All second alarm fires
- Arson fires
- Fire death or injury, requiring pre-hospital care or transport to a hospital
- Explosions of any type; i.e. natural gas, incendiary devices (flammable and combustible liquids), and explosives, even if no fire resulted.
- An arrest or detention may result form a set fire or false alarm
- Fires in institutional (I) occupancies; i.e. hospitals, convalescent homes, care facilities for the elderly, foster care homes, jails, detention centers, etc.
- Fires in educational (E) occupancies; i.e. public and private schools, day care centers child-care homes, colleges, etc.
- Any time a large fire loss occurs

7.8.9 REQUESTS FOR FIRE INVESTIGATORS

7.8.9.1 Requests for duty fire investigators shall be as follows:

- The Incident Command Officer will contact Douglas County Emergency Communications (DCEC) for all fire investigator requests.
- DCEC will notify the duty fire investigators by phone or pager. There shall be not less than two fire investigators assigned to each of the three operational shifts.
- If upon arrival to the fire scene the duty investigator in charge feels that additional fire investigators are needed to properly manage the fire investigation scene, he or she shall contact DCEC with a request for the desired number of fire investigators.

- Investigators shall notify DCEC when responding to a fire investigation, and shall provide an estimated time of arrival to the scene.
- Investigators shall report their arrival to fire scenes to DCEC via radio.
- Investigators shall contact the Incident Command Officer immediately after arriving at a fire scene.
- Investigators working at a fire scene shall maintain radio contact with DCEC at all times.

Michael V. Hansen
Fire Chief

Josep Pedrola
Fire Marshal

EFFECTIVE DATE: 03/15/02

REVISED DATE:

APPENDIX B

Request Letter for Fire Agency Assistance

September 29, 2001

NAME
POSITION
AFFILIATION
ADDRESS
CITY, STATE, ZIP CODE

To Whom It May Concern:

My name is Josep Pedrola. I work for Douglas County Fire District No.2 in the capacity of Fire Marshal. I am currently enrolled in the Executive Fire Officer Program (EFOP) of the National Fire Academy in Emmitsburg, Maryland, to further my educational development. I would like to request your assistance in meeting one of the requirements necessary to complete the Executive Analysis of Fire Service Operations in Emergency Management part of the program. I am conducting an applied research project with the goal of obtaining the information necessary to prepare a procedure for the management of fire investigation scenes capable of meeting the needs of my agency in this area. I would appreciate it if you can take a moment of your time to answer the questions cited below. Moreover, I would appreciate it if you can send me any information you may have regarding the management of fire investigation scenes.

- What is the experience of your agency regarding the management of fire investigation scenes?
- As your agency planned for the event of managing complex fire investigation scenes such as, large fires, and fires resulting in death or injury?
- Does your agency have currently a fire investigation procedure in place?
- Do you know other agencies that have fire investigation procedures in place?
- What are the resources available to your agency to assist in managing fire investigation scenes?

I have enclosed a stamped self-addressed envelope and would appreciate it if you would send it back to my office with your comments. Please feel free to contact me via

telephone, e-mail, or fax if this is more convenient to you. Thank you for your assistance.

Sincerely,

Josep Pedrola
Fire Marshal
Douglas County Fire District No.2

Telephone: (541) 673-5503
E-mail: josepp@dcd.org
Fax: (541) 673-5505