



CHAPTER 9

Fire Prevention Through Investigation

LEARNING OBJECTIVES

Upon completion of this chapter, you should be able to:

- Identify local, state, and federal agencies involved in the investigation of fires.
- Describe the benefits of effective fire investigation.
- Identify the various roles adopted by fire departments to investigate fires.
- Identify agencies and organizations that provide fire investigation training.
- Discuss the use of case closure rate and conviction rate as measures of effectiveness for fire investigation units.

Case Study



In 1996, *Michigan Millers Mutual Insurance Corporation v. Janelle Benfield* was instrumental in setting the standard for fire scene investigation. The case was tried in the Federal District court in Tampa and involved a fire in the home of Ms. Benfield. Her insurance company, Michigan Millers Mutual, refused to pay her claim based on a determination by their investigator that the fire was incendiary and had been set by Ms. Benfield.

Michigan Millers' investigator, who had over 30 years of experience, testified that the fire was started on top of a dining room table piled with clothing, papers, and ordinary combustibles. He visually examined the fire scene and, because of the lack of evidence of an accidental cause, as well as related factors noted at the scene, concluded the fire was incendiary.

After cross-examining the investigator at trial, counsel for Ms. Benfield moved to exclude the investigator's entire testimony under *Daubert*, a federal rule of evidence regarding the testimony of expert witnesses. In the trial court's ruling striking the investigator's expert testimony, the judge specifically found that the witness:

cites no scientific theory, applies no scientific method. He relies on his experience. He makes no scientific tests or analyses. He does not list the possible causes, including arson, and then using scientific methods excludes all except arson. He says no source or origin can be found on his personal visual examination and, therefore, the source and origin must be arson. There is no question but that the conclusion is one to which *Daubert* applies, a conclusion based on the absence of accepted scientific method. . . . And finally, it must be noted that [his] conclusion was not based on a scientific examination of the remains, but only on his failure to be able to determine a cause and origin from his unscientific examination. This testimony is woefully inadequate under *Daubert* principles and pre-*Daubert* principles, and his testimony will be stricken and the jury instructed to disregard the same.

1. Should there be a national standard for fire investigators?
2. Does your state require fire investigators employed by state or local governments to be certified?

Information for this case study came from: MICHIGAN MILLERS MUT. INS. CORP. v. BENFIELD No. 97-2138. 140 F.3d 915 (1998), <http://caselaw.findlaw.com/us-11th-circuit/1396573.html>

Introduction

There is a commonly held misconception that fire destroys the evidence of a crime or that ashes and debris at the scene of a fire cannot be examined to develop solid information. However, countless convictions have resulted from the examination of the charred remains of arson fires. The meticulous dissection of electrical and mechanical equipment has led to the recall or repair of unsafe appliances and machinery. Government regulations for flame-resistant treatments for carpets, children's sleepwear, and bedding are all rooted in the methodical examination of fire

scenes. Fire code regulations regarding materials handling, processing, and storage, as well as emergency planning and preparedness, are all based on the fact that we found out how, where, and why fires start.

Tip

Examining the charred remains of arson fires can lead to convictions.

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Early Fire Investigation

Within 2 months of the Great Fire of London in 1666, a Frenchman described as a “mopish, besotted fellow” was hanged for the crime of arson.¹ An investigation revealed that the fire had begun in the home of the king’s baker, James Farynor. Kindling stacked near an oven ignited and fire quickly spread through the house, forcing Farynor, his daughter, and servants to escape out an upper floor window. The fire burned for 5 days, destroying five-sixths of the area within the city walls and leaving nearly 200,000 people homeless.

During questioning, Farynor had taken great pains to give testimony to prove that the fire could not have been accidental. He had ample reason to fear being blamed for the conflagration. When a weak-minded foreigner publicly bragged of setting the fire, authorities were only too willing to arrest him and he was sentenced to be hanged. It was later discovered that the wrong man had been convicted; the Frenchman could not have started the fire, since he had been aboard a Swedish ship and had not set foot ashore until 2 days after the fire. An account published 5 years after the fire squarely put the blame for the fire on the “drunkenness and supine negligence of the baker.”²

Determining the origin and cause of fires is an important part of preventing them and minimizing their destructive impact. To limit the damage from fires, we must know where, why, and how fires start and how fire behaves. By determining whether fires are accidental or the result of criminal acts, we are able to develop effective fire prevention programs and deter the crime of arson through criminal prosecution. In the wake of the Great Fire of London, the adoption of an ordinance regulating fuel storage might have accomplished more than a public hanging.

The Reason for Fire Investigation

The Federal Bureau of Investigation’s (FBI’s) *Crime in the United States*, a compilation of Uniform Crime Reports (UCRs) submitted by law enforcement agencies, is prepared annually and distributed throughout the United States. Statistics are provided on case

closure: those crimes in which someone is arrested, charged, and prosecuted. Categories include murder, forcible rape, robbery, motor vehicle theft, burglary, and arson. Data are compared by geographical region, jurisdiction size (population), and jurisdiction type (cities or counties).

The report is used as a tool to gauge the effectiveness of crime prevention programs. A blanket statement that law enforcement agencies manage their response to crime solely by the report would be inaccurate. However, police chiefs, elected officials, and the media do use the report as a benchmark to compare their jurisdiction’s response to criminal activity with that of others. Sometimes the report makes great headlines.

The 2012 edition of *Crime in the United States* reported that crimes against people, such as murder, aggravated assault, and rape, had a case closure rate two and one-half times that of crimes against property, such as motor vehicle theft, burglary, or arson (46.8 percent and 19.0 percent, respectively). The differences were attributed to more extensive investigation efforts and the fact that crimes against people often have witnesses who can identify the perpetrator.³ Of the 52,766 arson offenses reported for 2012, only 20.4 percent were closed by arrest, meaning those who commit the crime of arson have about the same statistical probability of arrest and prosecution as those who commit larceny (theft).⁴

The lesson here is not that police agencies do not care or do not take arson seriously: It is that they have many violent crimes against people and must bring their resources to bear where they have the greatest potential effectiveness on the overall crime rate. The fire service has the greatest stake in the crime of arson. Not only does arson endanger the public, but every fire also endangers the lives of fire fighters. Who better then to take on the crime?

Tip

The fire service has large stake in the crime of arson, as it puts both the public and fire fighters at risk.

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Organizations Involved in Fire Investigation

An initial fire cause determination has been a traditional function of the fire incident commander **Figure 9-1**. The unattended skillet left on the stove when the telephone rings begins a chain of events that most fire officers have seen many times. The origin and cause of cooking and other routine fires are generally determined by the officer in charge and noted on the incident report. Fire investigation by dedicated fire prevention bureau personnel; local, state, and federal police agencies; insurance companies; and private firms have generally been limited to fatal fires, potential criminal acts, and large losses. Each organization has a mandate to fulfill, whether it is to serve the public, the stockholders of a corporation, or an individual with a vested interest in the incident.

For the most part, organizations, especially governmental agencies, are able to work cooperatively toward a common goal. At times, there are conflicting interests, adding one more element to an already

complicated set of circumstances. It might be in the best interest of a particular person or business for a fire to be shown to have started in a particular manner, such as how in the aftermath of the Great Fire of London, James Farynor sought to prove that the fire had been started intentionally by a third party. It is common for conflicting fire cause determinations to be presented by opposing legal counsel within the court system in both civil and criminal cases.

Instances of jurisdictional conflicts among federal, state, and local officials or between law enforcement and fire prevention bureau officials are also an unfortunate, although infrequent, fact of life. The complexity of the process, dedication of staff and financial resources, and political implications, particularly involving law enforcement functions, have led some fire chiefs to steer clear of the function. However, no other organization has a greater vested interest in the investigation or prevention of fires than the fire department. It is our brothers and sisters who are put in harm's way on every single alarm.

Investigation by the Fire Department

Fire departments participate in the investigation of fire to some extent in practically every jurisdiction. The volunteer chief of a rural department, if he or she is unable to determine the exact fire cause or suspects arson and requests assistance from the state fire marshal, does so based on an examination of the scene and circumstances surrounding the incident. The chief's investigation may not have been in-depth, but without it, further investigation would have been impossible. At the other end of the spectrum, many metropolitan fire departments have established dedicated fire investigation units. These units are typically part of the fire prevention bureau and are staffed with trained investigators who, in many cases, handle the investigation from the fire scene through the courts. As with any specialty, initial training and continuing education are essential.



Figure 9-1 The fire chief or incident commander typically conducts an initial investigation into the origin and cause of every fire.

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Tip

Since fire departments are involved in the investigation of fires, company offices and chief officers should be trained in basic fire scene investigation.

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The legal authority for fire departments to conduct fire investigations usually originates within a state statute. The chief of the fire department is authorized, or in some cases required, to conduct or cause to be conducted an investigation into the origin and cause of every fire. The authority to establish an investigation unit with law enforcement powers also generally originates within statute, although in some instances, local investigation units actually derive their law enforcement authority from the state fire marshal. In these instances, local officials act as deputy state fire marshals.

Tip

In most cases, a state statute will dictate the fire chief's legal authority and responsibility to conduct fire investigations.

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Fire Prevention Bureau Investigation Units

The term *fire investigation* is a broad one and is composed of several functions, some or all of which are performed by fire prevention bureaus. Those that do not perform all of the functions rely on an outside agency, often the state fire marshal or state or local police department, for assistance. Support from federal authorities, notably the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), has become common in many jurisdictions, especially when dealing with incidents involving explosives, potential hate crimes, and/or federal crimes. U.S.

postal inspectors, the FBI, and other law enforcement agencies may also be involved. The Consumer Product Safety Commission is called in when a particular consumer product is involved in multiple fires.

NFPA 1033, *Standard for Professional Qualifications for Fire Investigator*, contains job performance requirements developed and maintained by the National Fire Protection Association's (NFPA's) Technical Committee on Fire Investigator Professional Qualifications. The skills, which are considered nationally accepted good practice, cover the areas of scene examination, documentation, evidence collection, interview and interrogation, postscene investigation, and presentation.⁵ NFPA 921, *Guide for Fire and Explosion Investigations*, is how-to document for fire investigators. The preface explains that NFPA 921 is intended to be a guide for use by public employees with statutory investigation authority and for private fire investigators for insurance or litigation purposes. It states the committee's goal is to provide guidance based on scientific principles and research.⁶

Certification

The International Association of Arson Investigators has maintained a national certification system for fire investigators since 1986 through its Certified Fire Investigator (CFI) and Fire Investigation Technician (FIT) programs. The CFI program is accredited by the National Fire Board of Fire Service Professional Qualifications and provides for recertification through fieldwork and continuing education. Certification involves a point system with credit for education, training and experience, and successful completion of a written test.

The National Association of Fire Investigators (NAFI) developed its certification program in 1982. Its certifications include Certified Fire and Explosion Investigator (CFEI), Certified Fire Investigation Instructor (CFII), and Certified Vehicle Fire Investigator (CVFI). The NAFI's certifications require attendance at a 4-day NAFI-sponsored course, a credential review, and successful completion of a written examination.

The Investigation Process

The functions involved in the investigation of fires include interviews of witnesses; follow-up investigation, including interviews and examination of records and test results; securing and serving search and arrest warrants; and court preparation and testimony **Figure 9-2**. It should be noted that none of these functions involves traditional firefighting skills and therefore require a significant amount of additional training. All require initial and refresher training in order to be effectively accomplished. Additionally, most involve state-mandated law enforcement training and certification.

Tip

Fire fighters must complete training and, in most cases, obtain certification in order to effectively complete the functions involved in fire investigation.

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Figure 9-2 Training for fire investigators includes courtroom testimony.

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Investigation of the Fire Scene

The element of fire investigation most commonly performed by fire departments is the primary determination of the origin of the fire, or where it began, and the cause **Figure 9-3**. In practically all fire departments, the initial officer in charge performs a preliminary fire investigation. When the fire cause is not easily determined or appears suspicious or involves criminal activity, assistance is requested, and responsibility for the investigation is assumed by those with additional training and resources.

In some jurisdictions in which the fire department does not assume responsibility for the entire investigative process, specifically trained personnel are assigned to investigate and process fire scenes. When the cause is determined to be incendiary, the jurisdiction's law enforcement agency is called in to handle further investigation, secure search and arrest warrants, and effect the arrest of those responsible. The fire department representative who processed the fire scene and determined the origin and cause of the fire becomes the expert witness for the



Figure 9-3 Investigation of the fire scene involves determining the origin and cause.

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prosecution, whose testimony will make or break the case. To be effective, a close working relationship between the fire and police departments is essential. The fire department personnel must be adequately trained and equipped.

Tip

The possibility of a conviction for arson depends on a thoroughly and effectively processed fire scene.

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Interviews and Follow-up Investigation

Effective interviews, evidence collection, and case management are skills often referred to as “old-fashioned police work.” They are skills that must be learned and honed. The temperament and aptitude needed to develop into an effective fire fighter and those needed to do the job of a police investigator are not the same. Care should be exercised in selecting personnel to work as fire investigators. The word *fire* in front of the word *investigator* does nothing to lessen the potential hazards faced by a criminal investigator who just happens to be a member of the fire department.

Tip

The jobs of fire fighter and fire investigator demand different temperaments and aptitudes.

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Fire investigators face the same potential risks to their personal safety as other criminal investigators. Some fire departments restrict investigators from carrying firearms so to reduce the political impact that could result from the use of deadly force by a member of the department. Placing personnel in situations in which they could encounter armed and dangerous felons without the benefit of personal

protection is ill advised. Fire investigators should receive the same level of self-defense, investigative, and legal training as criminal investigators employed by police departments.

Tip

In order to perform their job safely and effectively, fire investigators should receive the same level of self-defense, investigative, and legal training as a criminal investigators.

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Interviewing witnesses, executing search and arrest warrants, giving effective courtroom testimony, using armed and unarmed self-defense, and keeping up-to-date on legal issues require specialized training **Figure 9-4**. State fire training academies, state fire marshal offices, the National Fire Academy, the Federal Law Enforcement Training Center, and the FBI Academy are just some of the organizations and institutions that provide effective training. Professional associations such as the International Association of Arson Investigators (IAAI), National Association of Fire Investigators (NAFI),



Figure 9-4 Training in self-defense is a crucial aspect of fire investigator preparation.

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and International Association of Bomb Technicians (IABTI) also provide training.

Equipment and Resources

The types of equipment used by investigators on the fire scene are similar to those used at any crime scene, with additional items and equipment that reflect the hazardous nature of a fire scene and the fragility of the kinds of evidence that can be gathered. Good working relationships with the jurisdiction's police department may enable the fire investigation unit to purchase supplies and equipment through the police agency, which can result in considerable savings and reduce the supplies needed for inventory.

In addition to standard crime scene equipment, lighting equipment, evidence containers, shovels, screens for sifting debris, and other specialized items are needed for the fire scene. Fire scenes are photographed and sketched; fingerprints, tire marks, and footprints are sometimes recorded; and pieces of physical evidence are gathered, inventoried, and secured. A secure location must be provided for storage to prove an unbroken [chain of custody](#) for all items. Contracts for the forensic testing of evidence and for processing photographs can often be established with police agencies.

The system established to investigate fires within many jurisdictions falls somewhere in between the fully staffed unit within the fire department and the unit completely outside the fire department. Many jurisdictions with fire prevention bureaus lack the resources to assign personnel to the full-time investigation of fires, either because of the frequency of fires or fiscal constraints. "Inspector" is a somewhat humorous term that is sometimes used to describe personnel charged with both fire inspection and fire investigation duties. It is possible for an individual to excel at both, though to truly wear both hats, personnel must have the ability, aptitude, and training to perform both jobs. The downside to this combined arrangement is that the skills needed for investigating and inspection are not the same. Personnel are forced to work all the harder

at attaining and maintaining their edge. The upside is that the knowledge gained from either discipline will improve performance in the other. An inspector who truly understands fire behavior and can use that knowledge to educate the business community while conducting inspections can accomplish a great deal. A fire investigator who has a good grasp of both building and fire codes can use that knowledge to better understand fire behavior and fire spread.

Courtroom Testimony

Arson is unlike other crimes in that within the court system, even proving it occurred is often the most difficult task of the prosecution. To prove arson, all accidental causes must be effectively eliminated. Fire investigation reports must be accurate, complete, and concise. Weather conditions must be noted to eliminate the possibility that a lightning strike was responsible for the fire. Similarly, electrical, mechanical, and other ignition possibilities must be taken into consideration or ruled out during a visual observation.

Tip

All accidental causes must be effectively eliminated before arson can be proved.

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Defense attorneys must only establish the possibility that a fire was caused by some accidental means to move the jury to acquit their client. Imagine if that were the case with other crimes, such as in the fictional scenario below.

DEFENSE ATTORNEY: Ladies and gentlemen of the jury, we will stipulate that my client was in the bank on October 31st, and that he was armed with a handgun and was wearing a mask, and that when arrested he had \$20,000, and a dye pack had exploded, covering his

torso with red dye. The prosecution has failed to prove that my client is guilty. On the stand, the detective could not positively eliminate the possibility that my client wasn't on the way to a Halloween party, dressed as a bank robber, and that he stopped by the bank to get money for the collection plate for Mass this Sunday.

Measuring Effectiveness

The measure of effectiveness for a fire investigation unit is the case closure rate, not the conviction rate. The best to be hoped for is that 100 percent of the fires be classified as accidental or incendiary, with every incendiary fire leading to an arrest. The rate of conviction lies with the prosecutor and is beyond the control of the unit.

Tip

Case closure rate, not the conviction rate, is used to measure a fire investigation unit's effectiveness.

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Arson is a complex crime that can be difficult to prove. A common tactic used by prosecutors is to offer to drop an arson charge in return for guilty pleas for other related crimes. If a criminal breaks into a residence, steals valuables, and sets a fire to cover the evidence of the crime, multiple offenses have occurred. If good investigative work at the fire scene leads to the arrest and conviction of the perpetrator, the case is a success, even if the arson charge is dropped in a plea agreement.

Fire investigators can present the perfect case to the prosecutor and still not obtain a conviction, unless the prosecutor can convince a judge or jury that the accused is guilty. Close cooperation between investigators and prosecutors is critically important. Time spent cultivating a relationship with prosecutors is time well spent.

Tip

A case in which an arson charge is dropped in return for guilty pleas for other related crimes is still considered a success.

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