



## Engineering Sciences - 2017

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### D24 The Fire Marshal and Forensic Fire Investigation

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After attending this presentation, attendees will be able to identify the legal and statutory duties of the local fire marshal in a science-based fire investigation, understand a number of ethical and forensic implications associated with reporting a fire, discuss the jurisdictional limits of a fire marshal, and be able to identify some ethical and forensic limitations associated with data collection and reporting when the legal or statutory duty of the local fire marshal does not extend to root-cause or engineering failure analysis. This presentation is accompanied by a case study.

This presentation will impact the forensic science community by providing case facts meant to highlight how the duties of the local fire marshal can provide important testimony regarding culpability, yet still fall short of determining responsibility in civil or criminal litigation. Increased liability is of interest in situations in which there is a loss of life or property due to non-compliance with codes and standards, when the nature of the responsibility is a deliberate omission or an unintentional act. The information presented will be beneficial to fire investigators and public officials responsible for life safety in the local community.

Insofar as forensic fire investigation, it is the duty of the fire marshal to determine the cause, origin, and development of a fire within a jurisdiction and report findings to the state. His or her conclusion will determine whether a crime may have been committed, as in cases of arson or criminal negligence. If there is no evidence a crime may have been committed, then the fire marshal classifies the fire as natural, accidental, or undetermined. This will close the official investigation and no further attempt will be made to gather empirical data. Information reported is pertinent; however, it is limited to data required to fulfill the fire marshal's obligation to the state.

Fire investigations more commonly result in civil litigation than criminal prosecution. Although the local fire marshal or another public service agent may be deposed or must otherwise testify in a civil matter, it is the root-cause failure analysis performed by an engineer or private sector fire investigator that will usually point to civil responsibility. Insurance companies and independent forensic firms are better funded and can often bring a particular case further along to determine specific liability. An investigative engineer can avoid misinterpretation of evidence at the fire scene by studying the local fire marshal's incident summary, photo documentation, and investigative report. The fire marshal receives emergency dispatch notifications and begins data collection concurrent to the arrival of fire and rescue services. He or she should be able to provide a first-hand incident summary, from the initiation of emergency response to the termination of the incident at headquarters, and a written report based on the guidelines, published in the National Fire Protection Association document NFPA 921, for conducting a science-based fire investigation.

The case study that will be presented details the total destruction of a 4.5-million-dollar home in rural Connecticut. This case will show the progression of litigation after criminality was dismissed by the local fire marshal. Facts to be presented will illustrate how reports made by the Office of the Fire Marshal can provide data on origin, development, and proximate cause; confirm exculpatory statements during civil litigation through exclusion; and articulate how the scientific method was used to determine fire cause and origin within the scope of his or her investigation. Ethical implications regarding specific requests for data or statements that exceed the parameters of such an investigation (e.g., complete failure analysis of an appliance or system and testimony regarding the degree of engineering certainty in determining root causation) will be discussed.

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## Fire Marshal, Fire Investigation, Failure Analysis

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