



# FIRE & INVESTIGATOR ARSON

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## What's Inside: Investigating Residential Dryer Appliance **FIRES**

**OC + SME + 921 =  
Successful Investigation**

IAAI 70th International  
Training Conference & Expo  
Jacksonville, Florida



Preview the 2019 ITC class line-up  
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# OC + SME + 921 = Successful Investigation

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The Industry Standards  
for Subject Matter Experts

Having discussions with other fire investigators we came to a realization that very few of them understood the working relationship between the Subject Matter Expert and the Origin and Cause Investigator. Further discussion determined that even fewer investigators understood the requirements located in the NFPA 921 guidelines. The intent of this article is to provide knowledge of these 921 requirements and to clarify the roles of these two different investigators. This parallel process plays an important role in fire determination as directed by our scientific method. The opinions of these qualified investigators will assist in this understanding and may invite further investigation and application by the readers.

As a Subject Matter Expert, I was recently involved in a discussion regarding my specialized service with a few Origin and Cause Investigators. During this conversation, I came to the conclusion that they did not have a clear understanding of my tasks at the fire scene or my interaction with the process of origin and cause. This concerned me as I also realized that they did not clearly understand the NFPA 921 guidelines for this interaction and the recommended team approach. I questioned them and discovered that they were not familiar with the following terms "Subject Matter Expert", "Specialized Personnel", "Technical Consultant" or "Industry Expert". Further questioning determined that not one of them could cite any sections or even an appropriate chapter that would apply to these terms and my specialized tasks. Based on this conversation, I determined that an article might assist them as well as others to understand this process and identify the appropriate individuals necessary to complete an investigation. This article is an attempt to clarify these recommendations, their intent, and the process necessary to assemble a good team that meets the suggestions of NFPA 921 and the scientific method.

The following information will focus on the interaction between the Subject Matter Expert (SME) and the Origin and Cause Investigator (OC). Although this article reflects my experience as a Fireplace and Venting Expert, it can also be applied to all SME fields and their interaction during the investigation and testimony. This article will also



review the applicable sections of NFPA 921 and explain the team effort for a proper and successful investigation.

The Origin and Cause Investigator is expected to understand a large number of products, materials, and construction practices. However, knowing and understanding all products and applications is unrealistic. As we already know, attempting testimony in a field that you have no personal experience may result in embarrassing testimony, disqualification, or a negative impact on your case. As specified within NFPA 921, the OC may also rely on information provided by others. This information includes eyewitness testimony, first in firefighters, product information, and information provided by the Subject Matter Expert.

It is my opinion that strong foundation should always be provided by Code, Standards or Guidelines. NFPA 921 provides professional recommendations that should be followed to ensure a proper investigation in determining the origin and cause of the fire and any potential responsibility. The following sections will discuss these recommendations and assist in applying this information to your investigation. I have included my opinions as an SME as well as opinions from a qualified fire origin and cause investigator, where beneficial to these requirements and how they may affect the investigation.

## **Chapter 15 Planning the Investigation**

### **15.5 Specialized Personnel and Technical Consultants**

**Section 15.5.1 General.** During the planning of a fire investigation, specialized personnel may be needed to provide technical assistance. There are many different facets to fire investigation. If unfamiliar with a particular aspect, the investigator should never hesitate to call in another fire investigator expert who has more knowledge or experience in a

particular aspect of the investigation. For example, there are some experts who specialize in explosions.

**SME's Opinion:** *It is my opinion that this recommendation is provided to ensure an accurate investigation and to prepare for future testimony or trial. The true understanding of a specific product is critical to a proper investigation. I have experienced more than one investigator destroyed during sworn testimony due to the lack of knowledge and experience in a specific field. Know your boundaries and limitations.*

**OC's Opinion:** *While fire origin and cause investigators are required to meet JPRs and have and maintain at a minimum up-to-date knowledge of the 16 topics provided in NFPA 1033 to a level beyond high school, it is impossible for the OC to possess expert knowledge in all areas of expertise related to fire causation. When OCs are presented with circumstances beyond their available knowledge, it is essential for them to look to others with knowledge beyond their own. This may come in the form of an electrical engineer, mechanical engineer, fireplace expert, etc... The additional information provided by such SME can be critical in conducting an investigation in accordance with the scientific method and NFPA 921.*

**Section 15.5.1.1.** Sources for these specialized personnel/experts include colleges or universities, government agencies (federal, state, and local), societies or trade groups, consulting firms, and others. When specialized personnel are brought in, it is important to remember that conflicts of interest should be avoided. Identification of special personnel in advance is recommended. Subsections 15.5.2 through 15.5.10 list examples of professional or specific engineering and scientific disciplines, along with areas where

these personnel may help the fire investigator. This section is not intended to list all sources for these specialized personnel and technical consultants.

**SME's Opinion:** *It is my opinion that the importance of this section is the determination of conflicts. There are many product experts that represent manufacturers or have worked directly for these companies. This can create a serious conflict if the cause of the fire is later determined to be directly related to a product failure or malfunction. By this time, it may be too late to find another expert to support your findings. This consideration brings us back to the planning stage of the investigation. Be sure to consider the scope of your SME. Are they there to just provide information regarding the product or are they qualified to take this investigation to trial?*

**OC's Opinion:** *A product expert is a tool used by a fire investigator in identifying specific failures that have contributed to the fire event. This tool cannot be used until the origin of the fire has been determined, as well as the potential cause that requires additional investigation with the assistance of a SME. This individual should not be retained until the appropriate time in the investigation, which will minimize potential conflicts. Conflict checks should also be run by both the OC and SME prior to retention.*

**Section 15.5.1.2.** It should be kept in mind that fire investigation is a specialized field. Those individuals not specifically trained and experienced in the discipline of fire investigation and analysis, even though they may be experts in related fields, may not be well qualified to render opinions regarding fire origin and cause. In order to offer origin and cause opinions, additional training or experience is generally necessary.

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**SME's Opinion:** This is critical training necessary to connect the appliance or product as related to the heat source and the first fuel ignited. If there is limited or no fire training by the expert, they should only be able to testify to the appliance or product and should not be allowed to testify regarding first fuel ignited, fire damage, fire patterns or fire progression to support such claim. They may be able to explain how the product operated, normal operating temperatures, or any potential malfunction of the product. However, the OC will have to carry this expert across the finish line.

**OC's Opinion:** The OC and SME should work together in completing the investigation in accordance with NFPA 921 and the scientific method. While the OC is providing the information regarding the location of fire origin, first fuel ignited, fire damage, fire patterns, and fire progression, this information directly correlates with the information provided by the SME regarding the specific details of the failure, to provide a comprehensive determination of fire cause.

**Section 15.5.7 Industry Expert.** When the investigation involves a specialized industry, piece of equipment, or processing system, an expert in that field may be needed to fully understand the processes involved. Expertise with the specific fire hazards involved and the standards or regulations associated with the industry and its equipment and processes can provide valuable information to the investigator. Industry experts can be found within companies, trade groups, or associations.

**SME's Opinion:** The detailed review of the expert's Curriculum Vitae is required to determine if this expert is the right expert for your investigation and the pending testimony. Simply choosing an engineer or an owner of a stove shop is not the correct method of vetting. All industry

experts must be able to meet the requirements of the investigation as directed by the fire scene, witness testimony, and the needs of the Origin and Cause Investigator.

**OC's Opinion:** In choosing an SME to assist in a fire investigation, the OC must choose wisely. This is best accomplished by researching the SME expert's area of specialty to ensure that the SME will be able to provide the most thorough information related to the case at hand. You should not retain an electrical engineer to evaluate an electrical fire in a building that originated at a fluorescent light fixture just because that individual is an electrical engineer. There may be an SME available that specializes in light ballasts that is better suited to provide information related to the fire. Do your homework and choose the best SME for your case based on your available evidence.

## Chapter 24 Incendiary Fires

### 24.3 Potential Indicators Not Directly Related to Combustion

**Section 24.3.2 Fire Near Service Equipment and Appliances.** A fire near gas or electrical equipment, appliances, or fireplaces may be intended to make the fire appear to be from an accidental cause. The investigator should examine the fuel supply or service connections to determine whether they were loose or disconnected and then should determine whether tampering or sabotage of the equipment or appliances has occurred. If the investigator does not have sufficient knowledge regarding the equipment or appliance, it should be examined by qualified personnel.

**SME's Opinion:** It is the task of the SME to confirm or deny that their subject matter product contributed to or caused the loss. The elimination of a product is just as important as the determination of the cause. Without this elimination or inclusion,

the fire would and should remain undetermined.

**OC's Opinion:** The OC investigator should take steps necessary to evaluate all viable ignition sources within the area of the service equipment prior to bringing in a technical expert. This includes the collection and analysis of debris samples to establish the possibility of the presence of ignitable liquid residue. If at that point, the OC needs a technical expert to evaluate the service equipment, an individual should be retained to assist in confirming or denying whether the product contributed to the ignition of the fire. This step should not be taken until all hypotheses have been considered and it has been determined that the service equipment requires additional evaluation.

## Chapter 26 Appliances

### Section 26.4.1 How the Appliance Generated Heat.

**Section 26.4.1.1.** Before it can be concluded that a particular appliance has caused the fire, it should first be established how the appliance generated sufficient heat energy to cause ignition. The type of appliance will dictate whether this heat is possible under the normal operating conditions or as a result of abnormal conditions. The next step is to determine the first material ignited and how ignition took place.

**SME's Opinion:** As an example, many factory-built fireplaces have very sensitive cooling systems and may be affected by modifications, alterations, or addition of field fabricated material. Understanding how these systems perform, their means of failure, and the value of this failure is critical to the success of a case. Guesswork by unqualified individuals will not meet or exceed the minimum requirements set forth by NFPA 921.



**OC's Opinion:** *It is the responsibility of the OC to conduct proper research regarding system performance, means of failure, and the value of the failure. This information may best be obtained by consulting with an SME. Along with the information, the OC investigator must also obtain information related to the installation, service, modifications, alterations, etc. This information is best obtained through the OCs due diligence in conducting interviews with parties of interest and obtaining maintenance records, etc.*

**Section 26.4.2 The Use and Design of the Appliance.** The use and operation of an appliance should be well understood before it is identified as the fire cause. Some appliances are simple or very familiar to fire investigators and may not require in-depth study. However, appliance design can be changed by the manufacturer, or an appliance can be

damaged or altered by the user, and therefore, each, appliance warrants investigation. More complicated appliances may require the help of specialized personnel to gain a full understanding of how they work and how they could generate sufficient energy for ignition.

**SME's Opinion:** *As an example, solid-fuel and gas-burning appliances have dramatically changed in the last fifteen years. What many view as simple systems are much more complicated with electronic ignition systems, oxygen depletion sensors, safety shut-off switches, high temperatures, and much more. My thirty-nine years in the fireplace industry has given me knowledge that cannot be obtained by simply talking with others. Combining this information with my twenty-three years of experience investigating fires and explosions has given me a great deal of valuable knowledge. Without*

*this specialized knowledge, it would simply be considered an assumption or speculation. Working with the Origin and Cause Investigator, I can research and investigate my product and share this information with the team. While the OC testifies on the fire cause and progression, I testify to the fine details regarding my product and how it contributed to the loss.*

**OC's Opinion:** *As technology is constantly evolving, so are the use and design of appliances. While information relative to the use and design is obtainable through resources such as the internet and product manufacturers, knowledge and experience related to the history of the product and product updates is essential to the fire investigation and may play a key role in identifying the cause of the fire. In this case, it is necessary for the OC to rely on an SME to aid in the investigation.*

After reviewing NFPA 921 and discussing our opinions, I feel that it is time to ask a few questions. These questions are intended to consider the consequences of an incomplete investigation. Many of these investigations will never result in deposition or trial testimony. But if they do, these questions might assist you in your direction.

- Q: Can you explain the difference between working with the local appliance installer and an industry expert with special knowledge of the product?
- Q: Can you offer or consider a difference in professional value between these two sources?
- Q: Is it reasonable to assume that an appliance has enough heat to result in fire if you have no specialized knowledge or experience with a designed or engineered system?
- Q: If the Origin and Cause Investigator simply repeats what he is told by a specialist, how strong is his or her opinion in trial?

**In conclusion, one can ask the simple question:**

**Do you feel that you know enough about the widget, gizmo, gadget, or item that you are evaluating?  
If not, who should you call? The correct answer would be to call a qualified SME!**

## AUTHORS BIOS

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Mr. Dale Feb is a Subject Matter Expert for F.I.R.E. Associates, a nationwide corporation focusing on the investigation of wood and gas-burning hearth appliances & fireplaces, commercial exhaust systems, chimneys, vents and other heat producing products such as fire pits and barbeques. He is a qualified SME who provides fire investigation, site inspections, consulting, and expert testimony for residential and commercial installations. He has extensive knowledge in all model building codes, has qualified as an expert in both state and federal courts, and is a recognized education provider. He has hands-on experience in the Hearth & HVAC industries and professional training in fire investigation. He has served as Chair on the NFPA 211 Committee for the last six years, and is the Immediate Past President of the California Conference of Arson Investigators / IAAI Chapter 22. For a copy of Mr. Feb's current CV please contact his office at 805-552-9954 or visit his website @ [www.FireAssociates.org](http://www.FireAssociates.org)

### Richard Jones

Mr. Jones is the owner and Chief Fire Investigator for Forensic Investigations Group, LLC., the first commercial U.S.-based organization to obtain accreditation to ISO/IEC 17020 for fire and explosion origin and cause investigation. Mr. Jones has over 22 years of experience in the field of investigations for both the public and the private sectors. He earned a degree in Fire Science Title Page with all info from Columbia Southern University and is an experienced lecturer on fire and explosion investigations. Mr. Jones is an IAAI-CFI, IAAI-CI, IAAI-ECT Facilitator, F.I.R.E. Certified Inspector, and holds numerous state and national certifications. He has been recognized as an expert witness and has provided testimony on both the state and federal levels. He has been actively involved in the IAAI for 19 years and continues to serve on numerous committees within the organization. For a copy of Mr. Jones's current CV please contact his office at 985-871-1459 or visit his website @ [www.ForensicInvestigationsGroup.com](http://www.ForensicInvestigationsGroup.com).