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## Investigation of Fire Scenes

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The investigation of fire and explosion scenes is not an exact science, but, it is based on science and scientific facts. Fires behave in a known and given way, based on scientific principles. Not all fires are the same, in fact, no two fires are the same or behave in exactly the same way; this is due to the changing atmospheric and physical elements involved in the burning process and the way in which the fire is initiated, and then develops, spreading into unburnt fuel as it does so.

An investigation at a fire or explosion scene has one aim; to ascertain the origin of the fire/explosion and the cause. A fire investigator has the objective of determining these two things. Once determined, there will quite often be sufficient evidence to make a determination regarding the reason for the event; as accidental, a deliberate act or a naturally occurring event (e.g. lightning strike, spontaneous combustion etc.). In some instances there may be evidence uncovered that raises suspicion about a particular person/persons as being involved with the cause of the event; however, the particular role of proving this fact is left solely with the Police authorities. Facts that may assist the Police, uncovered in the physical investigation, will be passed on for further inquiries to be made, but the actual proof required to prosecute any person suspected of an offence should not fall to the fire investigator, but be left in the hands of the Police.

The physical investigation begins from the time the request is received for the investigator to attend the incident scene. Time of fire/explosion call received, who called, the attendance (Fire Brigades, Police etc.), time of arrival, what was observed en-route to the scene, what was observed on arrival, actions taken on arrival, weather conditions, unusual observations made (suspicious person, person/people leaving the scene, people dressed inappropriately); observations made by the investigator en-route, on arrival, conversations with first responders, observations at the scene. Once the necessary notes have been taken detailing the responders and times etc. the physical inspection of the site can begin. The recognised protocol is to start outside the structure, observations regarding burn marks, smoke marks, and objects foreign to the scene, structural damage that may affect safety or present risks to safety, and, any other indicators that lead the investigator to areas of significance. After this, the interior inspection is conducted, starting at the area of least damage and working toward the area of most damage; observing burn patterns, fire damage indicators, smoke travel indicators and observations of materials affected by the fire/explosion as it has travelled through the structure. During this inspection the investigator takes contemporaneous notes, photographs evidence and items of interest (possibly video as well), sketching and diagramming if necessary, with relevant measurements recorded for use later to compile a thorough report regarding the scene, the evidence, the interpretations made and the hypothesis deduced as a result. A final hypothesis is arrived at once the original hypothesis is tested to see that it will withstand scientific rigour, cross examination and competing conclusions.

The methodology utilised for the investigation is the "**Scientific Method**":

- Recognize the need
- Define the problem
- Collect data
- Analyse data
- Develop a hypothesis
- Test hypothesis
- Select Final hypothesis

(NFPA 921, 2008. Ch. 4)

This is the methodology taught and recommended, worldwide, for fire investigators to conduct their investigation, to ensure that the evidence observed and collected is sound and will withstand rigorous examination. The MOST IMPORTANT aspect of this methodology is that factor regarding the final hypothesis. The investigator should thoroughly question their evidence and their methodology to see that their reasoning is not flawed and that their final hypothesis is sound and follows scientific principles.

In trying to train and prepare fire investigators for their tasks ahead, the following is provided to show the true picture, a fact of life that they will eventually face!

### **The True Picture**

*It is the investigators who, having spent much time at scenes and in statement and report preparation, enter the courtroom as the impartial representative of their organisations. In addition to the proper testing of their evidence by cross-examination, much may be made of ambiguous terminology and imprecise fire reporting, such as "Doubtful Origin" and percentage causes. Well-briefed defence counsel, sometimes supported by experts of dubious provenance, may attempt to undermine, or render inadmissible, scene investigators' evidence by the misinterpretation (or cynical manipulation) of current guidelines.*

**Scene investigators will be on their own in negotiating this minefield.**

**It is best they are well prepared!!**

Another very important fact to remember - "**Every fire scene is a potential crime scene**" + "**every fatal/serious injury fire is a potential murder**". (DeHaan, (2007) Kirk's Fire Investigation)

Another sobering factor realised by investigators – "**You will only get one chance with the scene and evidence – do it right the first time!**" [Author]

Investigators are taught to seek consultation with the legal representatives presenting their evidence, to ensure that the lawyer is aware of what evidence is available, and can be presented. There is nothing more frustrating to an investigator than to be excused from the witness box, still having fifty percent of the evidence in his/her head!

### **Reference List**

DeHaan, J.D. 2007. *Kirks' Fire Investigation*. Pearson Education. USA.

National Fire Protection Association. *NFPA 921 A Guide to Fire and Explosion Investigation*, 2008. NFPA Massachusetts USA.