

SCIENTIFIC METHOD AND THE FIRE INVESTIGATION REPORT

An outline to writing the investigation report that includes the points required in the scientific method.

Recognize the need	<p>On February 10, 2008 a fire was discovered in a occupied wood frame single family residence (occupied or vacant?) of approximately 1300 square feet. The interior was painted sheetrock walls and ceilings. The floor was wood covered with carpet and vinyl. The exterior covering is vinyl siding with a shingled roof. The weather at the time was clear and windy with an approximately temperature of 40 degree F. (Any recent storms? How is the interior conditions, dry?)</p>
Define the problem	<p>The fire department arrived to find smoke coming from the eaves of the residence on the north end with fire exiting the structure through the front windows. An aggressive interior attack was mounted and confined the fire to the area of the living room, kitchen and dining room area. There were no clear indications of a cause.</p>
Collect Data	<p>Firefighters arrived to find a fire in the area of the front area to the structure with smoke coming from the windows and door on the front side. Firefighters entered the structure and extinguished the fire. During overhaul they found the area of heaviest damage at the sofa area. The area was protected and an investigator was requested.</p> <p>Examination of the scene by this reporting investigator found intensity fire patterns in the area of the living room to the right of the windows as viewed from the front porch. Lines of demarcation located in the area are indicating an area of low burning to the right side of sofa, towards an area in the center of the room. The room was damaged from the ceiling down around the room to approximately the 3 foot level except for the area at the sofa. (Any evidence supporting or eliminating flashover?) The sofa has loss of material (what type of foam-latex may spontaneously ignite) to the right end that has consumed all of the right arm and a table near it.</p>

Chairs on the other side of room have surface effects from the top down. Movement patterns are evident into the dining room and kitchen area. Other movement patterns found in the hallway and living room point towards the area of the sofa and end table as being the area of most intense damage.

Causes in the area of this lowest burning and the base of the intensity patterns are, a strip outlet, a lamp and outlet on the wall (**overhead?**), there are no smokers in the residence and nothing in the area that was known to spontaneously ignite (**pre-fire activities, no visitors that smoked**). The strip outlet is consumed with nothing left other than the center metal contact strips. They appear to be in good condition. The remains of several items plugged in to the strip outlet were found. The items were a lamp on the table, a small gauge cord going towards the sofa, and a battery charger for a camera (**battery being charged?**). The cord going onto the sofa went to a mass of melted plastic that the owner identified as being a notebook computer. The battery charger was not in use at the time of the fire (**was the charger plugged in?**). The lamp was off. The residence was secure at the time of the fire and no problems are known by the owner of anything in the structure that could have caused the fire. (**Any electrical problems reported, breakers, fuses, flashing lights, recent electrical activity, lightning strikes?**)

(Also include feedback loops for additional data collection from analysis and hypothesis testing).

Analysis the data

The fire patterns at the scene indicate that the area of most intense damage was to the right hand end of the sofa and the table. All heat and flame vectors point back to this area. The entire end of the sofa was consumed except for the wire spring and metal parts for the footrest. There was no other low burn in the area of burning and no other patterns other than the ones noted above. The probable ignition sources in the area were examined and the items found to produce heat were examined further. The lamp was off and the wires showed external heating from the fire. The light bulb was destroyed in the fire finding the wattage of the bulb was unknown. There was no

evidence of an ashtray or cigarette butts found in the area of the lowest burn. Nothing capable of spontaneous ignition was found or known (eliminate latex foam from couch, chair, and pillows?). The cord from the strip outlet to the sofa where the owner claimed to have left a notebook charging was damaged and showed evidence of failure about 4 feet from the strip outlet. The battery charger had no battery in it that would have been drawing current (was it plugged in, energized?). There is no evidence or facts that indicate any other fire cause.

Develop a hypothesis

The cause of the fire appears to have been from the overheating of the power pack or the processor for the notebook computer (collect more data, check CPSC recalls for all chargers, camera charger, lamp, power cords. Also check and collect data on the power cords that they are UL listed and not counterfeits.). This is from the heat generation of the items and it being conducted to the combustible sofa covering. Also if any papers or other lightweight combustibles were present they would be added fuel at the incipient stage of the fire. The most likely cause would be for the processor to heat up and ignite the cloth sofa covering. This would lead to the fires growth from the area of the sofa.

Test the hypothesis

All of the other ignition sources were examined and eliminated and the notebook computer and power pack for it was the remaining probable ignition sources (CPSC, forensic lab analysis). The computer would have to overheat to generate enough heat at the processor. This would happen if the grate that allows air to be pulled in by the fan is blocked or restricted enough to keep the cool air from passing over the processor and cooling it (were fans operational?). The power pack (eliminate battery gone bad scenario?) itself would not generate enough heat to ignite the cloth covering or other combustibles in the area (wattage, nearby combustibles such as carpet, papers and magazines).

Select final hypothesis

The most probable cause for this fire would be that the processor (could also be its internal power supply being overloaded) for the notebook computer overheated and caused heat to be conducted to the cloth covering of the sofa and causing ignition of it (time to ignition, or needs an intermediate step with surrounding papers). All other causes were eliminated. The fire patterns indicate that the area of the sofa where the notebook computer was located was the area of most intensity and the movement of the by products of the fire point to this area being the origin and cause of the fire.

Conclusion

The fire is determined to be accidental from the external heating of the sofa by the notebook computer processor and ignition of the cloth covering.

The investigation is complete at this time pending further information.