

# Odor Investigations: A Tough Call

BY FRANK C. MONTAGNA

**P**EOPLE CALL US WHEN THEY SMELL AN UNUSUAL odor in their homes or businesses. It can be a chemical odor, an electrical odor, an odor of smoke, a wood odor, or just a bad odor. Usually the source of the odor turns out to be nonhazardous, but often enough the source of the odor can pose a hazard. Frequently, the source of the odor, hazardous or not, isn't obvious to us. These calls necessitate that we perform an investigation, discover the source of the odor, eliminate that source, and vent the area, leaving the occupants safe. Although this may seem like a simple task, sometimes it is not so simple. Because we have responded to many of these "odor calls," we readily recognize a number of different odors, and this enables us to quickly locate the source of some odors. Firefighters, for instance, easily recog-

firehouse or home to bed or to the dinner getting cold on the table and, since they think it is an unnecessary hazardless response, they wonder why the chief doesn't just tell them to take up.

In hindsight, I realize that I experienced this syndrome as a young firefighter. We had a chief who would hold us for a long time at these types of responses that I, in my probationary firefighter's "wisdom," knew were bogus. I, in my wisdom, knew that in the end, we would either not find the source of the reported odor or we would find that it was benign. After all, I had responded to any number of these responses and could pretty well figure out in the first five minutes if it would amount to anything. This chief, I thought, was a real pain. He was a nervous Nelly. He would hold the whole first-alarm assignment while the truck was looking for the source of the odor. He did this in the winter, and

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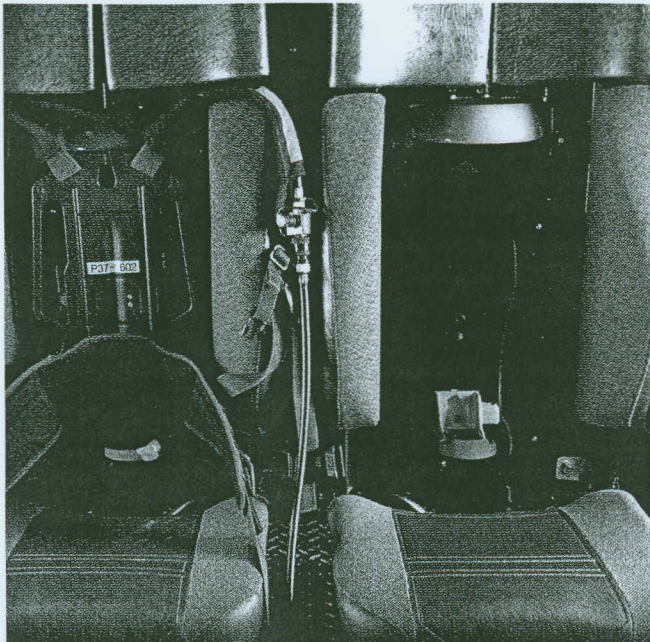
nize the odor of burning food, and the source often is easy to find. On the other hand, an electric odor, while many times easy to recognize, is often difficult to track down. The key to successfully investigating and mitigating odor complaints is to be systematic and persistent. A difficult odor investigation can occupy you for some time before you locate the odor's source.

Since many of us have received little or no training in conducting an odor investigation, we instead learn the skill on the job from other firefighters. This tried-and-true learning method, while often necessary, is not always the best, and the lessons we learn are not always correct. In addition, since we respond to so many odor investigations, we sometimes develop "routine-response" syndrome. "Routine-response" syndrome occurs because we have responded to so many incidents of a certain type, like odor investigations, that have turned out to be nonlife threatening. In many cases, responding firefighters will not smell the reported odor for a variety of reasons and will feel that it was an unnecessary response. Routine-response syndrome can result in firefighters making a half-hearted investigation. They want to get back to the

we froze. He did this in the summer, and we sweltered. We missed meals, we missed TV shows, and we missed sleep. Like I said, he was a real pain.

As time passed, I studied and was promoted to lieutenant, to captain, and finally to chief. I learned what it meant to be the person responsible for the safety of the people we serve daily. I learned what it was like to return to the firehouse and wonder if I had made the right call by closing an incident when the odor had dissipated and we could not find its source. I wondered if the people were safe or whether I would have to return later to a raging fire. I found myself holding the first-alarm assignment on the scene until I either found the source of a suspicious odor or was fairly sure that it was benign. My studies, my experience, and my position of responsibility made me aware of many more potential bad results that could occur as the result of an inadequate odor investigation. I had become the chief that I had complained about.

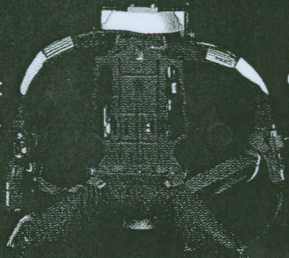
Now I understood why he held us so long. He was not a pain; he was thorough. He was not nervous; he was con-



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cerned for the occupants. He wanted to be able to put his head down on the pillow and not wake up the next morning to read about the family that had died as the result of a failed odor investigation that caused a structural fire. I knew that the firefighters with whom I now worked considered me a pain and a nervous Nelly for holding them at these incidents for so long, for making them miss a meal, or for making them freeze or swelter. Well, so be it. Like the chief before me, I was responsible, and I intended to act responsibly.

### INVESTIGATION TOOLS

Each of us has a number of tools at our disposal for conducting an odor investigation. We were born with these tools. They are our senses of smell, touch, sight, and sound. In addition, we have experience from the numerous odor investigations to which we have responded. We bring these tools with us to every investigation, and the more investigations we make, the more accurate they become. As we solve the mystery of what is causing an odor, we associate the odor with a source. The next time we encounter the odor and recognize it, we have an idea of what we are searching for and where we should look, and this makes our job easier. We are learning to identify smells every day, both on- and off-duty, and we can search this growing database of odors to quickly identify a number of familiar odor sources.

With our eyes, we look for smoke, charring, and smoke staining. If we identify the odor as burnt food, we head for the kitchen. If it smells oily, we head for the basement and the oil burner.

With our ears, we listen for the subtle sound of flame crackling out of sight, electric arcing, or the missing sound of an appliance that is turned on but not operating.

With our hands, we touch various objects—an outlet, a baseboard, or a light fixture—feeling for excess heat that could indicate the source of the odor.

We also have the thermal imaging camera (TIC) in our arsenal of odor-investigation tools. It can detect heat where we might miss it, and it should be a part of every odor investigation. Bringing and using the TIC at each smoke-odor investigation should be a standard operating procedure. Using it at each investigation will familiarize us with its operation and the interpretation of its display. We will learn what a normal outlet looks like as compared to one that is heating up. We will learn how a normally functioning fluorescent lamp should look, and we should be better able to identify one with a defective, overheating ballast.

Another tool we bring to the investigation is an inquiring mind. These types of responses require that we be more like detectives than firefighters. When conducting an odor investigation, we don't run into the building breaking windows and squirting water all around. Instead, we should locate the caller and interview him. We should ask him questions and use his answers to help us identify the source of the odor.

### SIZE-UP

When you arrive at the building, look at the surrounding area before you enter the building. Do your size-up. What type of building is it? Are there two chimneys, possibly indicating that there is a

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fireplace in addition to a furnace or a boiler? Do any surrounding buildings have a fireplace? Is smoke coming from either chimney or from one in an adjoining or attached structure? Are any outdoor fires burning? Is someone using a barbecue? Is there a commercial occupancy nearby giving off an odor? Is an odor coming from the sewer? Odors or smoke detected indoors can originate outdoors. Is a gasoline-fueled power tool being used in or near the building? Is there any indication of smoke visible from the outside of the building? Do you see a plumbing truck parked in the vicinity? Plumbers sweating pipes have been the cause of a number of fires that can smolder for some time before flaring up.

### THE INTERVIEW

Following are some of the questions that should be asked in the interviews of callers, occupants, and other witnesses:

- **Who smelled the odor?** Try to get first-hand information.

A third party might be good intentioned, relating what someone else told him, but he might also be inaccurate. Although it is important to speak to the person who smelled the odor, don't ignore others who offer information. They may be able to give you good information about the building, its appliances, past occurrences of the odor, and other helpful tidbits. More than one person may have smelled the odor, and each may have different information.

- **When was the odor first noticed?** Putting the odor in a time context will help you decide what might have caused the odor. If an appliance that is operating when you arrive was not operating when the odor developed, it is probably not the culprit.

- **What was going on in the building when the odor was first noticed?** Did the heat kick in before the odor appeared? Was anyone cooking? What appliances were running? Did the lights flicker? Are any lights not working? Does anyone smoke? Was any recent work done in the building?

- **Is the odor still present?** All noses are not created equal, and some people can smell odors missed by others. In the odor-detection business, we are often at a disadvantage because of the many odors and chemicals to which we have been exposed in the past. We might not be able to smell a particular odor because our sense of smell has been damaged.

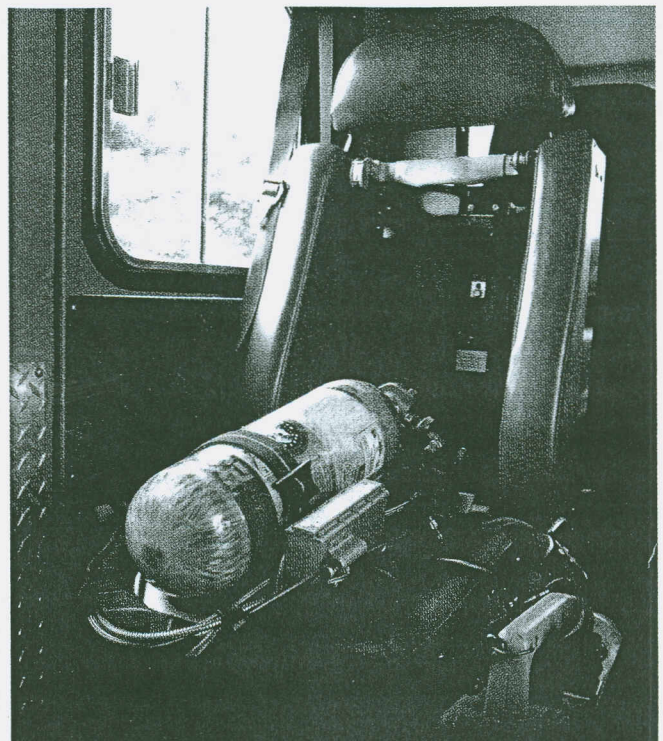
- **Are there multiple occupancies, and could the source be coming from a different occupancy in the building?** In an apartment house or multifamily home, the occupant calling the fire department may smell an odor originating in another occupancy in the building. Is there an illegal apartment in the building that the caller is not telling you about?

### THE INVESTIGATION

Once you have gathered information from the occupants, start your investigation. You may have gathered enough information to direct you to the source or at least to the area where the odor originated.

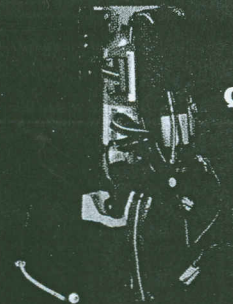
- **Scan the area with your TIC.** It will show you if excess heat is developing in appliances and behind walls and ceilings. It is a useful tool but not an infallible one. Although it can pick up heat that you do not see, it can also miss heat under certain circumstances.

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• **Use your senses.** You should continually be scanning with your eyes for signs of combustion or something that might explain the odor and sampling the air for odors with your nose. Firefighters easily recognize electrical odors; they have experienced them. You should be able to not only detect the presence of an odor but also determine if it is growing or diminishing.

You may not smell a reported odor because you have a cold, because it has dissipated prior to your arrival, or because of some other reason. You can inadvertently cause the odor to dissipate by repeatedly opening the door. Sometimes the smell from your own smoky turnout gear can interfere with your ability to recognize a reported odor, or the smoke odor on your gear may be mistaken for the reported odor. An odor that is evident when you enter an occupancy can become undetectable as your olfactory system becomes desensitized to it.

Your sense of touch can tell you if a wall, an appliance, or a ceiling is warm or hot. You may be able to hear hidden fire crackling behind a wall or an appliance making a noise it should not be making or not making a noise that it should be making.

• **Bring in a fresh nose.** It is always a good idea to keep a few firefighters outside in fresh air while others conduct an investigation for the source of the odor. Our sense of smell can diminish when exposed to odors, making it impossible for us to locate the source of the odor. You may think that the odor has dissipated even though it is still present, because you can no longer smell it. It is a good idea to keep firefighters outside

in the fresh air and to call them in when you no longer smell the odor. They, in turn, can continue the investigation if they, in fact, detect the odor. Alternatively, you can send some firefighters back outside to refresh their sense of smell and then bring them back inside to continue the investigation.

• **Be nosy.** What's in the garbage? Did an occupant burn something and hide it in the garbage? Was a burned pot tossed out of the kitchen window into the backyard by an embarrassed husband? Did a teenager toss his cigarette into the toilet when his mother said she smelled smoke? Look in the garbage, look out the window, and lift the toilet seat and look in the bowl. You would be surprised at how sneaky people can be.

• **How many firefighters do we need to conduct an odor investigation?** The answer is, it depends. It depends on the building and the odor. If conducting an investigation in a private dwelling, a few firefighters should be capable of conducting a quick, thorough investigation. If, however, the building is a factory, a school, or an apartment building, more firefighters will be needed, and they will have to spread out to the different areas of the building. If the odor seems as if it is hazardous or toxic, there may be the need for a quick search and evacuation, using all of your personnel in full personal protective equipment.

### CHEMICAL ODORS

Chemical odors can be the result of used or misused cleaning products, exterminating chemicals, construction or repair work,



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illegal drug processing, and a myriad of other possibilities. If you respond to a reported chemical odor and find the occupants ill from the odor, they may be suffering from exposure to a toxic chemical, carbon monoxide, or food poisoning, or they may just have a weak stomach and a nasty odor in the building. In any event, mask up so you do not become part of the problem. Search the building for victims who were not able to exit the building on their own while simultaneously looking for the source of the odor. If the source is discovered to be a hazardous or toxic substance, you must recognize that you may be operating at a hazmat incident. If necessary, effect evacuation or protect in place, and call your hazmat unit to the scene. If the odor is the result of a common chemical or process not requiring a hazmat response, remove the chemical from the building, safely dispose of it, and ventilate the building to make it safe for the occupants to return. If it turns out that the odor is the result of an illegal operation or process, evacuate victims and initiate a police response.

### WOOD ODOR

Although a wood odor can be harmless, it is an odor that demands close attention. It all too frequently signals that somewhere in the building a structural wood element is smoldering, hidden from view, and will eventually erupt into a full-blown structural fire if it is not discovered and

extinguished. It is an odor that you should find it hard to walk away from. An improperly installed or deteriorating brick fireplace could have allowed floorboards to char and smolder. A loose connection at an outlet could heat up in the wall and ignite a wood stud. The flue from the oil burner might have ignited a floor joist close to it. It could also be the smoldering wood handle of a mixing spoon lying on the dishwasher's heating element or some other less hazardous cause, but the smell of burning wood must be given the attention it deserves.

### DISSIPATED ODORS, CONCLUDING YOUR INVESTIGATION

The incident commander (IC) must ensure that his firefighters take seriously every odor investigation he supervises. They must conduct a thorough investigation every time. They must use all of their tools, including their senses, their TIC, and even their combustible gas indicators and carbon monoxide meters. An odor could be the result of a flammable gas leak, and although carbon monoxide has no odor, the things that produce it, like an oil burner, do have odors. As a precaution, include these meters with the tools you use to ensure the safety of the building's occupants.

Once an odor has dissipated, the officer in charge must decide if it is safe to end the investigation and leave the scene. This is a tougher decision to make than you might think. If you are unable to find the source of the odor, as often happens, you cannot know for sure if the condition that caused it is resolved. If, for instance, it is an electric or wood odor, and you have not identified its cause, you cannot know for sure that it will not become hazardous after you leave. Yet, you cannot continue the investigation forever. You must conclude it.

In the end, the IC makes his decision based on his experience, his department's policies, the results of his investigation, and his good judgment. None of us wants to be called back to a fire in a building that we previously investigated for a smoke odor, but sometimes it happens. When it does, civilian and firefighter lives may be at risk. In addition, you can expect lawyers to question your actions or inactions, seeking to blame and sue you and your department. Establishing a procedure for odor investigating and following it on every odor call will go a long way toward making your decisions good ones and keeping the building occupants safe. Remember, there are no "routine" responses. ●

● **FRANK C. MONTAGNA** is a battalion chief and a 40-year veteran of the Fire Department of New York (FDNY). For the past 23 years, he has served as a chief officer and is assigned to curriculum development at the FDNY Bureau of Training, creating training programs for chiefs, company officers, and firefighters. He has a degree in fire science from John Jay College, where he has taught fire science and management courses and is teaching a course based on his book *Responding to "Routine" Emergencies* (Fire Engineering, 1999). He is a member of the editorial advisory board of *Fire Engineering* and is a contributor to *WNYF*.

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