

/ Anna Leigh Homa, Public Information Officer

WHEN THINGS GO BOOM

For some, hearing the word bomb might bring to mind the picture of a disgruntled individual sitting in a basement, surrounded by objects that individually would be harmless, but when expertly combined can wreak havoc. For explosive investigators it might bring to mind the aftereffects of what that bomb can produce: fire, death and destruction.

Explosives investigation, part investigative science and part forensic science, encompasses many different experts in varying roles: bomb squads; firefighters; safety professionals; insurance and private investigators; forensic chemists and other criminalists; and civil, electrical and mechanical engineers. According to Tom Thurman, former FBI special agent and current professor of fire, arson and explosion investigation at Eastern Kentucky University, each has a distinct role in a bomb investigation:

- The investigators at the scene, pick through the pieces, gather evidence and recreate the scene.
- The investigators out in the field interview witnesses, match the components to known bomb makers and develop the means, motive and opportunity.
- The experts in labs and on computers help piece it all together.

To investigate a bomb scene, you must take into account the different aspects. First, there's investigating the scene in order to find components of the bomb and second there's linking those components to the builder in order to put the person(s) responsible in jail, Thurman said.

Investigating a bomb scene poses a series of challenges to the investigator including:

- basic crime scene investigation skills, in conjunction with specialized disciplines,
- an understanding of the blast dynamics,
- the ability to recognize the components of a bomb (explosive and non-explosive)
- knowledge of what the forensic laboratory can do.

"When you gain the insight, experience and knowledge of how people – the bad guys – deal with explosives, it makes you a better detective and can better solve cases," said Lt. Rich Sohan, Louisville bomb squad commander. "It's like becoming a robbery detective – you want to learn as much as you can about the motives of the robber. I like to know how a bomber's mind works, so I'm better able to solve those cases."

An explosives investigator can be compared to a homicide detective trying to solve a crime, trying to recover shells or bullets, if it was a shooting, and interviewing people to identify the person who pulled the trigger or who was responsible for the murder, Thurman said.

"It's the same thing with bombings," he said. "It's just that with bombings the crime scenes are difficult because the scene is not such as an orderly scene as you would have in most crimes."

Bombing crime scenes are considered some of the most horrendous to investigate, not only because of the carnage to victims, but the destruction of property can make it difficult to locate any components of the bomb. Sometimes the blast is so intense ev- >>

>> Everything in the immediate area is destroyed and debris is shot through the air hundreds of feet away, Thurman explained.

But, contrary to popular belief, a bomb investigation doesn't always happen after an explosion. The Louisville bomb squad seldom deals with post-blast investigations. They usually get calls concerning problems like a box left in a place it shouldn't be or dynamite placed at an apartment door, Sohan said.

On average, the squad receives about 45 calls a year, many for the recovery of an explosive. When the squad gets a report of a bomb placed in a building or a suspicious package in an office, they grab their gear, get to the site and follow specific protocols to make sure it's safe.

"Safety for us is paramount," Sohan said. "It's always foremost in our minds."

Because of the merger of the Louisville and

▼ Below: Front of the north side of the Alfred P. Murrah Federal Building in Oklahoma City, killing 168 and injuring 800 people. ▼ Right: Pieces of a clock used in a timed bomb. Investigators are lucky to find any components of a bomb, and if they do, the pieces can be very small.

Jefferson County police departments, LBS has two sets of gear and are probably one of the best equipped bomb squads in the United States, Sohan said. Their equipment includes two of everything: robots, trucks specifically designed and equipped for bomb squad operations, full sets of response gear, tools and six bomb suits.

Robots are the primary tool used, not only for bomb squad operations, but for SWAT and hostage negotiations as well. The robots are very versatile. Fire departments use them for handling hazardous materials and they can be used in mining incidents for search and rescue or recovery efforts, he said.

Squad members must stay physically fit due to the nature of their job and the full bomb suit weighs 90 pounds. Everyone in the squad goes through the Peace Officers Professionals Standards training at the Department of Criminal Justice Training and does a physical training test every year, ensuring their ability to handle the gear. The lighter 70 pound suits come with a self-contained breathing apparatus and are only used for situations involving chemicals, Sohan said.

The suits are made of Kevlar, like a bullet-proof vest, and are coated with a Nomex fire protectant, which protects the officers from five types of blast injuries. Most of the weight comes from the large ceramic plate that covers vital organs, from the neck to the upper part of the thigh and a 20-pound helmet to protect the head.

"It's fairly miserable, but it's better than the alternative," Sohan said.

With 14 people, the LBS is the largest bomb squad in the state. The squad is made up of volunteers, but each one had to undergo thorough testing and interviews before being accepted. Most squad members have a military background in explosives.

But regardless of whether an officer focuses on pre- or post-blast investigations, all squad members must have training and certification to perform investigations. LBS squad members can be gone for at least three months each year, attending conferences and training schools or doing demonstrations for other departments.

"It's a challenge learning new things in a constantly changing environment," Sohan said. "It's a challenge to gain the experience to be able to deal with explosives."

Investigating a bomb has multiple elements and technicalities.

"A successful investigation has a lot to do with the scientific method, once you figure out who it is, what they've done and why they've done it, you have to prove it in court," Sohan said. "A lot of different facets go into it, so it takes a great deal of education to be a bomb technician."

At a minimum, a basically-trained technician goes for six weeks of training at the FBI school in Huntsville, Alabama. Each member of the squad is required

to keep up with 40 hours of training a year and at least one, eight-hour training class a month, Sohan said.

Education and certification is a must. During a trial, laboratory examiners are often considered expert witnesses and must testify that objects found at the scene were combined to make a bomb, or if only a few parts were found, what other components were needed to cause the explosion. If their testimony is questioned, which, despite what you see on television shows, doesn't happen often, they have to establish their credentials so what they say can be taken as fact, Thurman said.

But in the academic world, there is no certification one receives for explosive investigation. People may graduate from a school that teaches explosive investigation, like the FBI or the Bureau of Alcohol, Tobacco, Firearms and Explosives and they may get a certificate of completion, but there is no actual certification officers can attain, Thurman said.

At EKU, anyone graduating in fire and safety engineering and technology will be certified by the National Association of Fire Investigators, which focuses on investigating explosions due to gas or liquid, not on explosions caused by a bomb.

"There's a big difference between the two," Thurman said.

That is why the classes in fire, arson and explosion investigation Thurman teaches are very beneficial to the program.

"What our students know when they graduate is what the difference is between an explosion that is caused by what we call a diffused fuel – vapors and natural gasses – versus an explosives explosion," Thurman said. "And how will they recognize the difference?"

Thurman doesn't teach pre-blast investigation techniques. He avoids showing the students how to make a bomb in his classes. Instead, he teaches the components of a generic bomb. The students learn if they find certain materials together, it would indicate

a specific type of bomb was used.

Explosions aren't always a criminal incident, in fact many are done accidentally, Thurman said. An explosion can occur when someone reloads their own ammunition. Most of the fuel air explosions are accidental. Every investigation should start out fairly and impartially with no preconceived notions about the reason for the explosion until after the investigation has started, he said.

In post-blast investigations, a team generally collects evidence and does the field investigation. Each person has a specific assignment and the team works in tandem to collect evidence. The investigation usually starts around the outside of the blast and works its way in.

By and large, the greatest number of actual explosions in the United States are created by juveniles as innocent, but dangerous, mischief, Thurman said. In contrast, statistics show the greatest numbers of people injured or killed from bombings is for revenge or hate, he said.

The skills of the bomber dictate what type of bomb they make (a pipe bomb is the simplest). It also dictates how carefully bomb makers handle the bomb. Sohan has worked bombing scenes when a bomb maker accidentally injured himself while building a pipe bomb and another when the bomb maker actually committed suicide by blowing himself up.

Thurman teaches that every bomb scene is not the same, although it may appear to be that way. Even if you use the exact same bomb, you will not get an identical signature. Similar, but never identical.

"I don't like repetition," Thurman said. "To me it was a fun challenge to go to another country or across the United States, someplace I've never been before, and you've got a crime scene. You start working that scene, develop camaraderie there as people start the investigation. As far as I'm concerned, you can't get any better than that." J

Fact or Fiction

A majority of the bomb calls LBS receives turn out to be hoaxes, Sohan said. Recently, LBS fielded calls about a man committing robberies by placing suspicious packages at the location and telling everyone it was a bomb. The last one was in a bank and the box had an antennae sticking out of it, making it appear to be a remote-controlled bomb. Sohan and another technician were dispatched to take care of it.

"I would say my heart rate was in the high 200s at that time," Sohan said. "That was pretty exciting."

Just because something may look like a hoax, doesn't mean it is, so every bomb call is always taken seriously.

"Everything we come in contact with we have to treat as if it's the real thing," Sohan said. "You never know until you look inside of it or X-ray it as to what it contains."

"When dispatched to dispose of a bomb, when walking up to it, the only thing you can concentrate on is doing everything safely and as properly as you can," he continued. "But that can be hard to do because the walk you take down there may be the last time you ever walk again. In the field that is called the long walk, because usually you're by yourself, you're walking a minimum of 300 feet with a 90-pound bomb suit on and your hands are filled with tools to handle whatever you're going to check out. It's a long, lonely walk down and a long, lonely walk back up until you make the determination what's inside of it."

CLOSE CALL

Recalling a chilling incident, Sohan responded to a call of a bomb at a school where two juveniles placed a pipe bomb in front of the school in a covered trash can. The squad initiated the bomb. Debris shot out about 600 feet from the trash can, Sohan said. No one was injured but if the bomb had gone off just before or just after school, the results could have been catastrophic.

