Editorial

Crime scene investigation - explosives

Editorial

Volume 4 Issue 5 - 2017

Larry F Stewart
Chief Forensic Scientist, Global Forensic Services, USA

Correspondence: Larry F Stewart, Chief Forensic Scientist, Global Forensic Services, LLC, USA
Received: April 07, 2017 | Published: April 28, 2017,
Email larry@stewartforensicconsultants.com

Received: April 07, 2017 | **Published:** April 28, 2017

The would be Crime Scene Investigator that walks upon an explosion investigation must begin by determining if the explosion was due to an accident or instead criminal negligence or intent.

1993 World Trade Center bombing

To begin, everyone who saw or heard the explosion should be detained, questioned and documented. With each interview, the investigator should note:

a) The number of explosions,

b) The intensity (how loud and violent),

c) The color of the smoke or flames,

d) The presence of peculiar odors,

e) The name of the witness,

f) The reason the witness was in the area,

g) Whether the witness saw anything suspicious prior to the explosion.

There are two basic types of explosion. The "low" explosive results in a type of push effect, meaning there is no real visible progression outward from the source. It leaves a diffuse pattern. On the other hand, a high explosive has a definite origin point, easily distinguishable. Items are blown outward from the center origin. As you get farther away from the origin, the intensity diminishes.

Low explosives

These can have power approaching a few thousand feet per second. They include such explosives as gasoline or gunpowder. Typically, those witnesses in the area will characterize these explosions by hearing a boom, puff or popping sound.

High explosives

These include dynamite, nitroglycerine and C4 military explosives. They can have velocities upwards of 25,000 feet per second. Witnesses typically hear a shattering, high frequency sound. There should be a definite crater at the scene of origin.

Examining the Scene

One of the basic problems facing the investigator is inherent to explosions. Mass destruction implies loss of evidence. So, you are looking for little pieces and fragments and clues that would normally escape most. Trace evidence is the key. Small wires, pieces of metal and scoops of debris are key to solving the origin of an explosion. The actual scene may be as small as a room or as large as many acres. To document the scene, start from the outermost area of the explosion and work inward using a wedge type pattern leading to the center or origin of the explosion. The sheer size of some explosion scenes dictates a large number of qualified investigators and painstaking diligence looking for clues. Note the pattern of strewn objects. Are they pushing more toward a single space or are they evenly distributed? This can show whether an explosion occurred with some impeding factor, e.g. an explosion next to a wall would typically blow out from the wall more than through the wall as the path of least resistance. Some chemicals may be of interest in a low explosive scene. Those include:

a. Aluminum powder

b. Ammonium nitrate

c. Ammonium dichromate

d. Chromic acid

e. Iron powder

f. Magnesium powder

g. Metallic peroxides

h. Metallic potassium

i. Metallic sodium

j. Nitric acid

k. Potassium chlorate

l. Potassium nitrate

m. Potassium permanganate

n. Sulfur

o. Sulfuric acid

p. Zinc

The most commonly used homemade mixtures to create explosives include the following:

TATP & DADP(Triacetone Triperoxide) (Diacetone Diperoxide)

a) Acetone

b) Hydrogen Peroxide

c) Sulfuric Acid

ANFO(Ammonium Nitrate and Fuel Oil)

a) Ammonium Nitrate

b) Nitromethane or some other fuel oil, e.g. diesel

c) Sometimes charcoal or ground metallic powder have been added to increase the explosive force and as a fuel for the ammonium nitrate.

HMTD(Hexamine Peroxide)

a) Citric Acid (can also use Nitric Acid)

b) Hexamine

c) Hydrogen Peroxide

RDX(Cyclonite)

a) Nitric Acid

b) Sulfuric Acid

c) Toluene

Urea nitrate

a) Urea

b) Nitric Acid

Potassium permanganate

a) Potassium Permanganate

b) Sugar

Nitrocellulose

a) Sulfuric Acid

b) Nitric Acid

c) Cotton

d) Sodium Bicarbonate (baking soda)

Nitroglycol

a) Glycol (ethylene glycol)

b) Nitric Acid

c) Sulfuric Acid

Silver azide

a) Sodium Azide

b) Silver Nitrate

Mercury fulminate

a) Mercury

b) Nitric Acid

c) Ethyl Alcohol

An example of what an investigator may find was in a case involving a convenience store and a fire extinguisher. In that case a person drilled open the base of the extinguisher and removed the contents. He then, replaced the top portion with HTH pool chlorine, placed a metal flap as a barrier and then filled the bottom with Lysol. The metal flap was controlled by a servo switch from a remote controlled airplane. These switches are used to control the moveable features of a remote controlled airplane, e.g. the ailerons and landing gear. In this case they were used to remotely operate the flap from a distance. Once opened the explosive force was enough to completely annihilate the convenience store.

Acknowledgments

None.

Conflicts of interest

The author declares there are no conflicts of interest.

Citation: Stewart LF. Crime scene investigation - explosives. *Forensic Res Criminol Int J.* 2017;4(5):143–144.
DOI: 10.15406/frcij.2017.04.00127