

A simple plot

Liquid explosives provide an easy means of terror. How does law enforcement detect, prevent and respond to this threat?

The plot was simple: Take 14 bottles of contact lens cleaning solution aboard 11 airliners all bound for the United States. Inside the bottles, instead of contact lens solution, there would be deadly and unstable nitroglycerin, which is completely odorless.

The terrorists planned to detonate the bombs using simple Casio watches as timers, and small flashlight bulbs as detonators, with the filament being used to ignite the lethal mixture.

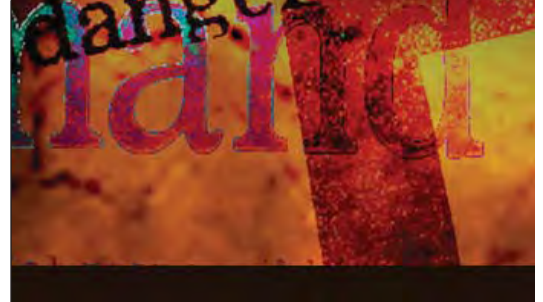
The plot would have been one of the most deadly in the history of terrorism. An estimated 4,000 people might have been killed and commercial aviation would have been

brought to its knees.

Of course, we all know this did not happen because on August 10th British Authorities arrested the bomb plotters, and that very same morning, travelers in the United States were already subject to discarding perfumes, toiletries and drinks. And today, we are all subject to the well-known security process of carrying on only enough liquids that fit in a clear plastic bag. Right?

Wrong. The above description is not referring to the foiled terror plot in London plot, but a scheme hatched more than a decade before and planned for January 21 and 22, 1995.





The text actually refers to Bojinka (which literally means “boom” in Afghani). The plot was conceived by Ramzi Youssef, the nephew of Khalid Shaik Mohammed, the bomber of the 1993 attack on the World Trade Center, and the mastermind of the 9/11 attacks respectively.

In other words, the fact that the Transportation Security Administration (TSA) has belatedly been made aware of liquid explosives does not mean they have not been a very important part of the terrorist arsenal for a very long time. Bringing down an airliner requires very little explosive force due to the already pressurized cabin.

Should law enforcement be concerned?

Liquid explosives have rarely been used in recent suicide bombings and certainly not in VBIEDs (vehicle-born improvised explosive device) where the quantities deployed and obvious instability of many liquid explosives mitigate against their use. So should law enforcement be concerned about liquid explosives?

The August 10 plot to bomb airlines traveling to the United States from the United Kingdom offers a partial answer and additional questions. Although the investigation is ongoing, it now appears that Lucozade bottles, with false bottoms, would be used. The Lucozade, (an English version of Gatorade) would be in the top part of the bottle, while the false bottom would contain the explosives. It has been reported by authorities the

liquid would be used to make either triacetone triperoxide TATP or/and hexamethylene triperoxide diamine. These would be mixed on board presumably. Either explosive can be easily activated by friction, heat or electrical charge.

Some have questioned this: A British Army intelligence officer with decades of anti-terror and explosives experience has said these explosives could not have possibly been armed on the planes. But this intelligence officer has not studied his terror history.

The same Ramzi Youssef was able to plant a bomb on an airliner,

with 1/10 the material he intended to use in the major Bojinka plot. He boarded a Philippine Airlines flight bound for Manila stopping at Cebu. He was able to arm his nitroglycerin bomb in the lavatory of the airplane and place it under a seat in the plane. Four hours later the bomb went off and killed a Japanese business man and caused many injuries but the mini-version did not bring down the plane.

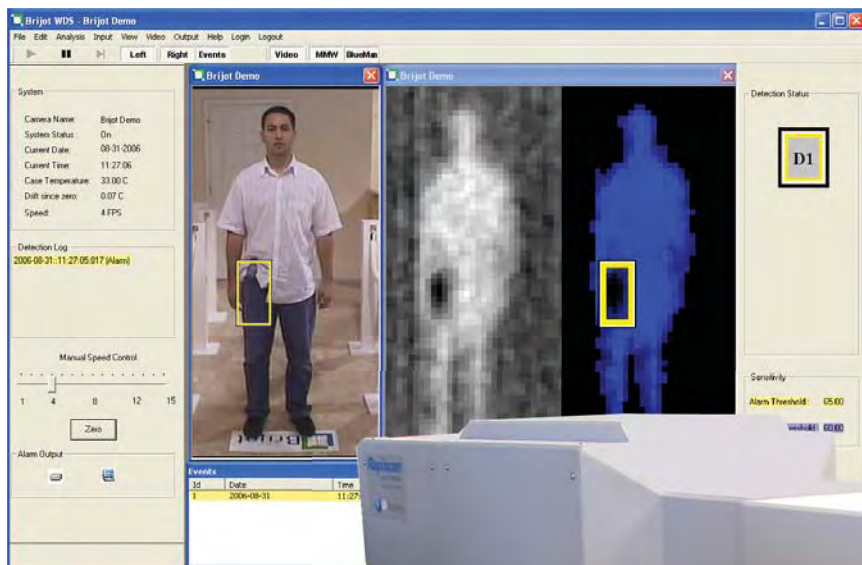
Terrorists are nothing but inventive when it comes to achieving their aims. Any one knows a good size bottle of Nitro, exploded at crowded venues such as stadiums

or theatres can cause fatalities, but the panic which ensues as a result contributes to many more deaths and injuries. In fact, Youssef first tested his liquid bomb prototype in a Manila theater, where it caused several injuries.

Law enforcement should definitely be concerned, even if they are not directly responsible for aviation security. Damage can be caused in many other scenarios and venues.

Defining liquid explosives

There are several types of liquid and gel explosives which law enforcement should be familiar with. Some of these explosives are very volatile — even picking up a bottle of say, nitroglycerine, and shaking it could cause an explosion. Force safety must be of paramount concern when answering a call to a suspected bomb-making site. When bomb-making activity is suspected, untrained officers should never touch anything at the scene without having



Above, outputs from Defender Tech International Solutions' passive millimeter wave system shows the detection of a container of liquid concealed against the body.

Rapsican Systems, at right, has developed systems that can detect liquid or gel explosives.





bomb techs clear the area before the investigation begins.

Familiarization with the types of explosives is also vital in detecting activity in bomb IED labs. You may answer a call about suspicious activity and fail to recognize the substances.

WaterGel explosives were developed to replace dynamite. They are packaged in plastic and look like very large sausages. They require a detonator and are not subject to heat, friction or electrical detonation.

Astrolite G and Astrolite A-1-5 (basically the addition of one additional component are

extremely dangerous but stable liquid explosives). There are simple formulas for putting these together for anyone with an Internet connection. Both are claimed to be the most powerful non-nuclear explosive (Astrolite G) and A-1-5 version is claimed to be the world's highest detonation velocity explosive. Both are clear liquid. These use mechanical or electrical detonation.

Two-component Kinepak is commercially available and looks like a syrupy red liquid, which when mixed with a white powder substance creates a very powerful explosive.

Nitroglycerin is the most instable

of explosives, but extremely powerful and detonation with explosion makes it much more powerful. It is a combination of sulphuric and nitric acid. It can be stabilized by a combination of freezing or re-constitution (cotton balls soaked and then dried) or the addition of compounds that can then be removed. The liquid looks clear but with aging becomes brown.

Incendiary chemicals are widespread and in a suitable container may cause large-scale damage. Gasoline, gelled gasoline, chlorate sugar and thermitite are some examples.



Middle Eastern terrorists favor Triacetone Triperoxide (TATP) largely because of its ease of preparation. It is not a liquid explosive, but rather a crystal solid form explosive made up of readily available liquids. All it takes is acetone, hydrogen peroxide (3-percent medicinal peroxide is not concentrated enough), and an acid-like hydrochloric or sulfuric acid.

It is important to realize new substances have the property of releasing large quantities of gas at high velocity (the essentials of an explosive) are being developed in terrorist bomb labs regularly

so the effort of classification and description is difficult.

Detecting liquid explosives

There are several problems with detecting liquid explosives. For this reason they have become more popular with terrorists. Solid explosive detection is relatively advanced. Also, just like Youssef, terrorists are constantly experimenting with different substances that will be useful to their aims either as rapid inflammation or explosive compounds. The most critical problem is the difference between organic and inorganic liquid

explosives. This means two types of detection need to be used.

The publicity of the August 10 plot has given rise to an entire industry determined to fill the holes left to terrorists to deploy these weapons.

Rapiscan Systems is developing four devices to detect liquid or Gel explosives, but they are relatively expensive. Machines can cost up to \$250,000 each.

For high-transit situations the devices have difficulties. Each bag must be placed in a closed compartment — and each and every bag would have to go through this

process, something that would cause immense delays whether at an entrance to a football game or airport.

A machine which detects explosives in liquid or solid form, does so by bombarding it with energy such as radio waves or neutrons. Software then processes the result to determine the chemical compound in the innocuous container.

Millimeter wave technology, such as Defendertech's camera system, can detect a bottle hidden under a person's clothing without being invasive.

Despite all efforts, terrorists come up with new compounds and there are certain compounds which have belied testing.

For example TATP has posed special problems for detection because it lacks a metal component or nitro groups that would make them amenable to detection by standard screening or rapid identification methods. Furthermore, since no electrical charge or wires are required to ignite TATP, the "problem" of setting off metal detectors is avoided.

"There has never been a successful attack"

This refrain is heard often from those who feel the attention to liquid explosives is somewhat redundant. Critics point to the fact that Richard Reid's shoe bomb failed and other plots were apprehended before they could be executed.

However, we know that terrorists will continue to use a modus

operandi, adapting it if necessary, to accomplish their goals.

Given this situation, what can law enforcement do?

Security Solutions International (SSI) trainings emphasize the point that terrorists are constantly adapting in this asymmetrical conflict. By looking for the bomber and not the bomb, we will automatically detect their constantly changing arsenal of weapons.

Without such an approach we are constantly at the disadvantage of the organized force trying to combat a guerilla tactic approach. Terrorist groups were nearly successful with liquid explosives in 1995. Despite this, for more than 10 years and certainly for 5 years after 9/11, there has been no significant effort to stop liquid explosives.

Only in a reactive mode, after August 10, did the TSA institute controls on liquids brought aboard planes. Likewise, the shoe bomber Richard Reid, has caused each and everyone to remove his shoes. But before his ill-fated attempt, no one had to have their shoes checked. This means he could have succeeded if the bomb had not failed.

Terror groups are already designing new improvised weapons of destruction. Since we do not know what these are, they are impossible to detect. The next generation may be a simple aerosol that causes everyone in the plane to be neutralized and allow terrorists to take over the plane. We can not know what weapon they will choose.

However, we can know who they are if we use forms of behavior



Outputs from DefenderTech International Solutions' passive millimeter wave system can detect liquids as well as plastics, ceramics and metals.

profiling that will lead us to couriers of destruction. They may even be innocent of the fact they are carrying out a terrorist's agenda — by the simple expedient of questioning such as is practiced in Israeli security systems and comparing answers and body languages to the principles of behavioral profiling. Unfortunately, this has become embroiled in the human rights aspect of ethic and racial profiling — neither of which can be effective per se against terrorists. Just as they change their weapons, terrorist groups change their looks and their members' racial and ethnic identities.

The best defense against any terror threat, liquid explosives included, is prevention and that lies with finding terrorists before they can use their constantly changing arsenals of destruction. ■

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