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Enemy on the Streets

Editor's Note:

Because tactical units are periodically called upon to assist at the scene of natural and manmade disasters, it is imperative that an appropriate level of awareness and preparedness be achieved. One contemporary area of concern to emergency planners is the continuing increase of the number of hazardous materials spills, nationwide. For this reason, the following article, which addresses this important subject, is included for the benefit of the membership.

We have an enemy out there on the streets! It is an adversary that has the possibility of killing you within seconds, or worse yet, making you a cripple for the rest of your life. It's not a criminal, but it is among the vilest and insidious opponents you will ever face. It is called hazardous materials.

Probably everyone has heard about the tragedy which occurred in Northern India recently. Two thousand people died. Thousands more have been crippled for life and hundreds of thousands emotionally scarred. What most people don't realize is that a leak of a similar chemical in England two years earlier hospitalized 35 firefighters who are still suffering the after-effects of the exposure.

Even more obscure is the fact that this type of situation occurs day in and day out in practically every community all across the United States. We have had our tragedies also. Roseville, California — a train explodes. Kingman, Arizona — an LPG tanker ruptures, killing 16. Los Angeles, California — the San Senai blows up in the harbor.

The spectacular hazardous materials events capture the headlines and capture the imagination. However, they are not the real problem as far as casualties and destruction go. The real problems are the incidents that don't involve entire cities, but rather involve one or two people who are first on the scene. Like the California Highway Patrol officer who arrived at the scene of a truck spill and got some white dust all over his boots in the process of examining the scene. Hours later, when the nausea struck him, the dizziness knocked him to his knees, and the blurred vision kept him from taking care of himself, did he realize he had been a victim. That is the reason for this particular article. For chances are if there is a hazardous materials spill or leak on the highway or on the surface streets, one of the first emergency services personnel to arrive on the scene is going to be a police officer. Police officers are armed with weapons to deal with violent human beings. But what do you need to be armed with in order to deal with a violent material which is capable of adding you to the list of police officers killed in the line of duty?



CHIEF'S FILE CABINET

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The answer is simple: You have to be armed with knowledge. Knowledge of what hazardous materials are: Knowledge of what hazardous materials can do, and knowledge of how to recognize them as quickly as possible to keep from becoming a casualty and to keep others from becoming casualties.

There are several distinct problems associated with dealing with hazardous materials problems. These are: Hazardous materials recognition, hazardous materials identification, and mitigating the effects of hazardous materials. Each of these areas requires specific knowledge and specific behaviors in order to improve your chances of survivability in hazardous materials incidents.

First off, let's deal with the problem of recognizing hazardous materials incidents. On the surface, that may sound like it is a relatively easy task. When you run across an incident where something smells bad, looks bad, or is on fire, there is a good possibility you will treat it as being a dangerous set of circumstances and give it a little bit of respect. Something Rodney Dangerfield may not get, but you have to be aware of with hazardous materials. So the first rule of thumb in dealing with hazardous materials problems is to treat ANY substance which is spilled or leaked as potentially hazardous. Even if it looks like soap suds and smells like molasses.

In one of the incidents involving police officers casualties, the material that was spilled was a white powdery substance which looked like talcum powder. It wasn't. It was a dust used as an herbicide. It was a systemic poison capable of being absorbed by the human skin.

Among the most common myths associated with hazardous materials is that anything which is dangerous smells bad. That's not true. To the contrary, some of the most lethal substances not only don't smell bad, they contain chemicals which serve as a sort of anesthesia to the olfactory nerves.

As a police officer, you have very limited protection in dealing with hazardous materials. When firefighters arrive on the scene, you will notice they are usually shrouded with heavy canvas coats, rubber boots, etc. As a police officer, you have nothing but your class A uniform between you and the material. Therefore, it is extremely important that you never allow anything to get on your body.

Hazardous materials have three routes into your body to be able to attack your physiological systems. These methods are: Ingestion (to get it into your mouth and throat); respiration (breathing it in through the nostrils); dermal (getting it on your skin and allowing it to soak through the pores of the skin).

Avoidance is the best means of protection. If you can smell something, that means you are respiring it; if you can taste it in your mouth, that means there is sufficient amount in the area to be a severe pollutant; and if you get it on you, there is a good possibility it will be absorbed by your skin. So avoid any spilled substances as if they were lethal.



CHIEF'S FILE CABINET

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Obviously there are circumstances, such as when you have to treat a casualty or when you have to remove someone from immediate threat of danger to their life, where you may actually get some of the material on you. Then it is time for decontamination. Tell someone about it.

What most people fail to realize about the forms of hazardous materials which are most insidious, is their effects do not show up for anywhere from an hour to eight hours after the exposure. This is especially true of dermal exposure. Therefore, if you get a substance on you, decontaminate it. Make sure your uniform is removed, all leather products taken off which have been soaked in liquids or dust, and your body has been thoroughly scrubbed in a lukewarm or cold shower.

If substances are not leaked or spilled, and yet an incident involves a truck, trailer, railroad or other means of public conveyance, there is another thing you with which you should become familiar. It is the Department of Transportation's hazardous materials labeling and placarding system. You have probably seen these placards by the hundreds while driving up and down the highways. They are those large, diamond shaped devices, affixed to the side of trucks and trailers, of various colors with four-digit numbers in the center. This is a hazardous materials recognition and identification system.

The Department of Transportation provides you, as a police officer, with a free book which you can obtain through the department to carry in your vehicle. This is an orange 5" x 7" breakdown of the Department of Transportation labeling system.

It is a good system for what it was designed to do. It was designed to warn emergency service personnel that hazardous materials are on board a vehicle. However, it does have very definite limitations, and there must be an appropriate response to the placards if they are going to be capable of saving lives and property.

First, let's discuss the system itself. It is designed to use different colors and different code names to allow emergency services personnel to classify a danger and attempt to classify the material which is creating the danger. For example, if you see a tank truck going down the road that has a large red diamond affixed to the front, rear, and both sides with the number 1203 on it, you can be reasonably assured the material it carries is gasoline. However, if you see another vehicle, same size and shape, same type of placard, but the number 1099 in the center of the diamond, then it is possible the material could be any one of a dozen different types of chemicals. The system allows certain types of chemicals to be carried under generic labels that do not allow you to specifically identify what is in the container.

There are other limitations to the DOT placard system also. For example, DOT regulations do not require certain materials to have a placard on the outside of the truck until they reach a minimum number of pounds of materials on the vehicle. That minimum number is 5,000 pounds. That means a vehicle may



CHIEF'S FILE CABINET

Ronny J. Coleman

be carrying 3,000 pounds of a certain classification of hazardous materials and not be placarded on the exterior. It will only be labeled on the boxes on the inside of the vehicle.

There are other limitations. The most classic example is the fact that oxidizing agents (those with yellow labels) often react violently under firefighting circumstances, creating explosion-like phenomena which are just as capable of dealing death and destruction as if they were dynamite. The Benzyl peroxides and all of the organic peroxides, for example, have this potential.

Even with its limitations, however, the placarding and labeling system is a far cry better than playing guesswork. You should become very familiar with the various types of placards which are placed on vehicles and have a good idea of what the generic classifications are by the various colors. This will allow you, upon arrival at a wrecked vehicle, to make an instantaneous determination that there is some form of hazardous materials present and allow you to put into action the appropriate behavior.

Another thing you should become intimately familiar with is the shipping paperwork and documents carried by vehicles which transport hazardous materials. Vehicles carrying these substances are required to have a shipping paper or a document in the cab of the truck within reach of the driver. If you are able to get your hands on these documents, they will not only classify the danger for you, but will provide you with the specific information as to what the substances being carried are. If you can get hold of these shipping papers, it is extremely important this information be shared with ALL emergency services personnel who arrive on the scene. This means you should get together with the incident commander from the fire department, the head of the ambulance personnel who are on the scene, your supervisor, and any other personnel who need to be aware of the dangers.

Another very important part of officer survival on hazardous materials incidents is the quick assessment of containers. Actually, this is somewhat of a very complex subject which involves different types of packaging requirements imposed upon hazardous materials. We do not have time in an article as short as this to explain all the various container profiles. We can provide you with one bit of instantaneous warning. Anytime a hazardous material is contained in a "pressure vessel," it is a potential threat. A pressure vessel is any kind of a closed container that has the potential of rupturing if it is exposed to high heat or instantaneous puncture. The spectrum runs from aerosol bottles which contain hairspray all the way up to large containers carrying liquefied petroleum gas.

From the standpoint of a police officer on the street, the most important thing to remember is that if a vessel is a closed vessel and contains any form of material which is capable of boiling off, it produces a phenomenon called BLEVE. A BLEVE is a boiling liquid expanding vapor explosion and is immediate danger to the safety of anyone in range of that explosion. The emergency response guidebook from the Department of Transportation provides you with a great deal of information on this phenomenon. In the



CHIEF'S FILE CABINET

Ronny J. Coleman

back of the DOT guidebook, for example, there are evacuation tables which set out minimum limits for minimum size containers and certain kinds of chemicals.

The guidebook, for example, will tell you that there is a distinct difference between the evacuation corridors and perimeters you need to set up for a BLEVE as compared to the types of evacuations and corridors you would set up for a vapor or liquid leak. A BLEVE requires an evacuation zone that is essentially a circle. A leak of a vapor or a liquid tends to have an evacuation zone shaped like a diamond.

These types of evacuation zones tell us a little about how to approach certain materials. For example, in the case of a potential explosion, the exclusion zone being in a circular pattern tells us it is impossible — or at the minimum, imprudent — to approach the base of a potential explosion from any direction. Whereas the diamond shaped pattern, caused by a vapor drift or by a liquid leak, indicates it might be prudent to approach these materials from uphill or from upwind. The vapor drift also has a characteristic called the “Isoplith.” The isoplith is the area in the center of the drift that is the most intense and therefore potentially the most lethal. As you move away from the isoplith on either side, it becomes less and less dangerous.

Now it is about time to discuss what to do if you have recognized and classified that hazardous materials are involved at a scene to which you have responded. As we indicated at the outset of this article, you can become a casualty of the situation yourself if you don't take the appropriate action. The speed with which you initiate some of the recommendations which are to follow may also have a lot to do with the survivability of others who are responding to the scene to assist you and victims of the incident.

Once you have identified that hazardous materials may be involved, IMMEDIATELY notify your dispatcher that you have identified the potential for these materials. You should request they notify all other responding emergency services; i.e., firefighters, ambulances, tow trucks, etc. It is not necessary that you get into a long dissertation on what the materials are, even if you know. It is more important that you let emergency personnel know as they are coming in that there is a potential for exposure. This is especially important for firefighters and paramedics. The most important thing you can do at this point in time is to completely isolate the incident. In other words, get everybody who is not absolutely essential totally away from wherever the incident is. Take actions to set up traffic control points to the downhill, downwind side of hazardous materials incidents immediately, and then proceed to box the area in as quickly as possible to avoid any type of convergence from non-essential personnel. If you can classify the materials and have specific information available which tells you exactly what you are dealing with, then use the DOT emergency response guide to determine if an evacuation downhill or downwind from certain materials is necessary. This may be among the most critical actions taken at the scene of an emergency involving toxic materials. Hesitation to conduct evacuations has resulted in unnecessary exposure to both emergency and nonemergency personnel.



CHIEF'S FILE CABINET

Ronny J. Coleman

If it is at all possible, position yourself uphill and upwind from the material at all times. If possible, you should notify the dispatcher to advise all emergency services personnel who are coming in to respond to a specific location which is uphill and upwind. The objective here is to keep everyone out of the routes of exposure.

At all costs, stay out of this material.

If it is essential that you have to get some of it on you in order to perform an immediate rescue, then report that fact to medical personnel on the scene, get yourself decontaminated, and report to your supervisor.

Some of the toxic materials that are out there and have created problems for emergency services personnel are very, very subtle poisons. In some cases, it is literally hours before the effects are felt by your body. In some cases, for example, the material may not show up for 12 to 24 hours. Therefore, it is important to have some means for medical surveillance or monitoring for a minimum of 24 hours after you have been exposed to hazardous materials.

You should be on the lookout for symptoms such as nausea, dizziness, blurred vision, excessive sweating, prickly feeling to the skin, muscle spasms or twitching. Any one of these symptoms is enough to be of concern; however, if more than one of these symptoms arrives simultaneously, it is almost a sure indication of exposure.

Well, that is about it for the basic rules for hazardous materials survival. This is a very complex field. There are those in emergency services fields such as the California Highway Patrol, fire departments, and hazardous materials response teams who have made an entire career of studying this phenomenon. It is highly unlikely the average, everyday, run-of-the-mill street cop is going to get the intensive training in hazardous materials to make him an authority on the subject. Yet, the reality is that they stand a far greater chance of being first on a scene involving hazardous materials than any of the other "experts."

There is nothing particularly heroic about becoming a casualty to these materials. As a matter of fact, many of the individuals who have been exposed haven't died for their lack of knowledge, but have lived crippled and disfigured for years. This problem is not a joke.

I happen to be a professional firefighter. I teach hazardous materials in fire academies. I serve on an international committee on hazardous materials and I feel ill prepared to deal with some of the circumstances of which I am personally aware.

We have a little standing joke when we teach hazardous materials to responding fire companies. We always tell them, "What are the first two things you look for at the scene of a potential hazmat spill? The



CHIEF'S FILE CABINET

Ronny J. Coleman

answer: Placards and sick cops.” Don’t let that happen to you! You have been schooled in defensive driving; you know about the use of weapons for defense; now add one more skill to your repertoire — defensive decision making. You will live longer and your wife and kids will love you for it!