

Fire department response to hazardous materials incidents*

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Abstract

Every day, hundreds of hydrocarbon and chemical releases occur across the United States. Without belaboring the obvious, when a Fire Department is dispatched to a hazardous chemicals emergency, the response has to be drastically different than when responding to a structure fire or a medical emergency — yet our personnel must be trained and ready to take decisive action regardless of the particular situations.

1. Introduction

The success or failure of a hazardous chemical incident (Haz Mat) revolves around receiving accurate information and exercising extreme caution. In simplistic terms, for 300 years the attitude of firefighters — a group of very action-oriented people — has been: see fire, attack fire, win. With a Haz Mat incident a 180 degree reorientation is demanded: stop, look, listen, evaluate, take appropriate action, however slow it may seem to the general public, and the average non-Haz Mat oriented firefighter.

Each chemical incident can manifest its own unique consequences, sometimes resulting in catastrophic injuries or death to firefighters. Protection of life — ours as well as the public's — is our obvious major concern when responding to an incident.

2. Objectives

The first objective of a Haz Mat officer is the protection of his personnel and any members of the general public that might be at risk.

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Preserving property and limiting the downtime of a production facility is the next most important consideration. This is, however, very much secondary in comparison with the protection of life. Last, but of equal importance, is preventing environmental impact.

Achieving these goals and objectives dictates how a fire department initially responds. This is followed by the intervention of fire department hazardous materials trained technicians. In short, only specialists can handle these situations.

Nevertheless, firefighters — however brave — are not chemists. All chemists should feel fortunate that this author is not a chemist, but yet a good firefighter. He has made it a point to learn, study, and train to be a good firefighter. One's life as firefighter depends on it. Hazardous materials mitigation is a positive off-shoot of the occupation.

3. Haz Mat response

Before continuing, it is important to pose the following question: What is the public perception of the role of firefighters in society? What does one think firesquads do at a hazardous materials incident?

First, when responding to a hazardous materials event, firefighters, after assisting the obvious victims, are going to isolate the area of concern and deny entry to all others by setting up a clearly defined danger zone. Depending on the chemical involved, firefighters may not be able to take immediate action to remove injured people from the danger zone due to a lack of appropriate chemical compatible protective clothing.

Hazardous materials standard operating procedures for firefighters are the best protection that has ever been devised during the time this author has been in the fire service [1].

As noted earlier, firefighters are trained to be action oriented. In short, they tend to be individuals who, with limited information, feel honor bound to go straight into dangerous uncontrolled emergencies to take decisive action to save lives and structures.

This approach to structural firefighting in the past is the very thing that led firefighters into situations wherein they received serious long-term injuries, or died, after becoming exposed to the effects of hazardous chemicals. It is paramount for *all* of us to understand that firefighters' protective clothing provides virtually *no* chemical protection for the wearer.

The decision to intervene in a hazardous materials incident depends on whether an action taken will result in positive effects. This plan is formulated based on the chemical (or chemicals) involved being accounted and identified and these hazards must be adequately researched so the potential danger can be fully understood.

Haz Mat responders then must refer to chemical compatibility charts to determine what protective clothing is best for the situation and its availability at the scene.

In addition, to mitigate a Haz Mat incident requires sophisticated monitoring equipment, as well as leak stoppage and containment materials.

If the material involved, and the circumstances surrounding its release have not been accurately communicated, then the danger to entry personnel is multiplied many times over.

The most important component to handling any hazardous materials incident is to receive accurate information as to what has occurred. Then, and only then, can additional necessary resources be utilized to safely handle the incident. Haz Mat responders will make appropriate entry and adequate decontamination will already be set-up for their exit from the area.

The steps of a Haz Mat incident are:

- Pre-emergency planning
- Dispatch
- Research
- Entry and reconnaissance
- Application of mitigation techniques
- Decontamination
- Termination and critique

Through intensive communication, mistrust and fear can be eliminated between chemists and firefighters, and a mutually benefitting partnership can be created to better handle these incidents. To cultivate this type of relationship requires interaction between the firefighters responsible for handling a chemical emergency and the facility manufacturing or utilizing the chemicals.

The importance of using up-to-date and complete information cannot be stressed too strongly. At least three references or data bases should be checked, since not all data are updated. Even the Material Safety Data Sheets (MSDSs) should be reviewed to assure they reflect the known and best knowledge. In essence, only after mutual understanding and respect has been established, then and only then, will hazardous material releases be handled more quickly and safely. The firefighter trained in hazardous materials incident mitigation is a force multiplier. For a very modest investment in additional equipment and training, you get twice the performance. This is a win-win situation, both the public and the fire and rescue services receive a direct benefit.

References

- 1 1990 Emergency Response Guidebook, U.S. Department of Transportation, DOT P-5800.5, Washington, DC, 1990.