

# The Hazardous Materials Technician Engine Company

by Captain John Flynn and Battalion Chief Robert Ingram

**H**azardous materials emergency response--perceived at times in the not too distant past as foreign and extraneous to the role of the New York City Fire Department--has become a significant challenge and opportunity for the FDNY in recent years. The exponential growth in the need for companies trained to deal with haz-mat releases is tied to a proliferation of new chemical substances and the ever-increasing threat of chemical, biological and radiation-based terrorist activity within our borders.

In an effort to keep pace with these challenges, the FDNY has established a unique company-based hierarchy of response, largely accomplished via an ever-growing Haz-Mat Group. From its beginning in September 1984 with one company (Hazardous Materials Company 1 or HMC1), four Officers and 35 members, the Haz-Mat Group now includes 69 fire companies with 1600 members and 20 medical units with more than 150 members.

A recent addition to this special group of companies is the Hazardous Materials Technician Engine Company, hereafter referred to as a "Tech Engine." Similar to the seven Squads and Rescue 5 regarding the training received and assigned haz-mat equipment, these 11 companies are known as Hazardous Materials Technician Units or HMTUs. Basic operating protocols for all HMTUs in the FDNY are provided in *Fire Tactics and Procedures: Hazardous Materials 8*. This article more fully describes the nature and characteristics of these unique companies.

## What is a Tech Engine and what is its mission?

Three Tech Engines currently exist in the Department--Engine 44 in Manhattan; Engine 165 in Staten Island; and Engine 274 in Queens. They were placed in service on August 8, 2004. A fourth Tech Engine (Engine 250) went in service on April 1, 2005. All members of these companies have received training consisting of 80 hours of intensive study aimed at bringing each member to the Technician II level of hazardous materials response. The study material is uniquely Department-specific; that is to say, it is based upon the challenges faced by the New York City Fire Department as observed during many years of dedicated response.

The FDNY is fortunate to possess a history of haz-mat emergency response experience culled from the past 20 to 25 years. Funding for all of the training, equipment, apparatus and training backfill costs primarily have come from the Federal Department of Homeland Security grants applied for through the Commissioner's Office of Intergovernmental Affairs.

The primary purposes of the Tech Engine/HMTU as stated in *Fire Tactics and Procedures, Hazardous Materials 8*, are:

1. Augment and support HMC1.
2. Provide haz-mat response coverage in their assigned haz-mat response area when HMC1 is not available.
3. Respond with other units in the Haz-Mat Group to large-scale haz-mat incidents for control, mitigation and mass decontamination.

4. Reduce response time City-wide for a Technician-trained unit to arrive on-scene to protect FDNY members and civilians.

The Tech Engine may respond to hazardous materials incidents of any description and magnitude. Commonly, it will be assigned by the dispatcher, based on the description of the incident, but also may be special-called by the Incident Commander. Generally, the unit will be part of a larger haz-mat response, consisting of Haz-Mat 1 and/or a Squad and the Haz-Mat Battalion Chief. Note, however, that there is nothing to prevent the Tech Engine from operating independently of these units. Such an instance may occur when the resources of the City are depleted or the capabilities of a single Technician Company have been deemed sufficient by the Incident Commander.

The role of the Tech Engine is varied, dictated by the circumstances of the particular incident. Generally, the unit either will supplement or expand the



Members of Engine 44 display an assortment of metering and pumping equipment for use at a haz-mat incident.

all photos by John Seley

The current levels of haz-mat response within the New York City Fire Department are listed below. As dramatic growth in the Haz-Mat Group continues, changes will continue and units may be added or modified to suit the needs of the Department, the City and civilians.

<b>Haz-Mat Group Supervisor</b>	Haz-Mat Battalion Chief and his Aide
<b>Technical Specialists</b>	Haz-Mat Company 1
<b>HMTUs (Technician II level)</b>	7 Squads, Rescue 5, 3 Tech Engines
<b>Technician II Personnel</b>	Rescue Companies 1, 2, 3 and 4
<b>Medical Haz-Mat Technicians</b>	21 HazTac Ambulances, ALS and BLS, trained to support Haz-Mat Technicians and triage victims in the Hot Zone with CPC if necessary
<b>Technical Decon Task Forces</b>	25 SOC Support Ladder Companies, Technician I 25 Decontamination Engines, ambulatory and non-ambulatory victim treatment
<b>CPC Rescue Personnel</b>	25 Battalion Chiefs 7 CPC Truck Companies, trained for rapid rescue of victims in a contaminated area requiring CPC. (Nineteen additional CPC Ladder Companies are scheduled for training in the spring of 2005.)

capabilities of the first-arriving units or assist the activities of Haz-Mat 1. Haz-mat-related activity undertaken by the Tech Engine will proceed under the direction of the Haz-Mat Battalion Chief in concert with the Incident Commander. This supervision by the Haz-Mat Battalion Chief initially may be handled by radio contact or Nextel communications to provide the FDNY Incident Commander with an early technical resource.

Specifically, the unit possesses the following capabilities:

- Identifies the material involved in a release.
- Controls the material involved in a release.
- Determines the level of threat that exists as a result of a release.
- Mitigates or reduces the impact of the release upon civilians, Firefighters, property and the environment.
- Packages the material in an effort to render it safe.
- Establishes a proper decontamination area.
- Communicates with inter- and extra-Departmental resources, including the New York State Department of Environmental Control, New York City Department of Environmental Protection and the New York City Department of Health.
- Provides a rapid and efficient response to especially hazardous releases and terrorist-based events involving chemical, biological or radiological threats.

In essence, the Tech Engine provides a rapid response haz-mat capability that augments, expands and extends the capabilities of the existing Haz-Mat Group.

When the Tech Engine leaves quarters for training or other non-response activities, the haz-mat tender accompanies the company. For response from quarters for other than haz-mat incidents, the tender is left in quarters. When out of quarters without the tender and assigned via radio to a haz-mat response, they will notify the dispatcher to inform the Incident Commander and Haz-Mat Battalion of a delayed response.

The Tech Engine HMTUs are not trained in Rescue Company special operations for collapse, high-angle, diving, trench and scaffold rescue. The special equipment required for these operations are not assigned or carried by the Tech Engine support vehicles.

The eight Haz-Tech Company functions described above are accomplished by using tools and equipment carried on both apparatus, many of which are described below:

- Tech Engine members have been trained to don many levels of personal protective clothing to permit entry, identification, control, rescue and mitigation activity in the event of an exceptionally challenging release. This includes the use of Levels A, B and C protective clothing, all carried by the company.

- The Resource Firefighter maintains a list of phone numbers and has been provided with a Nextel phone pre-programmed with key FDNY, City, State and Federal response agency phone numbers. The resources reached in this manner often are instrumental to the successful resolution of the incident.

- Mitigation often is accomplished through clean-up. The Tech Engines carry several kinds of pumps and associated hoses that facilitate the transfer of liquids directly into a drum (also carried by the unit, in various sizes) or other suitable reservoir. For corrosive spills, the Tech Engine carries powdered material that neutralizes the release on-scene, hastening DEP approval for safely washing the material away. The company also possesses unique items, such as a mercury clean-up kit, to permit rapid control of this heavy toxic metal. In the event of a release from a breached container, the Tech Engine possesses several "leak-seal" kits with specially designed cones, plugs and pads, some of which are pneumatically actuated, to rapidly reduce or eliminate the flow of product. For unusual and challenging metals fires for which water is ineffective and dangerous (i.e., magnesium or titanium), the company carries a supply of granular material designed to smother and cool the fire.

- Control is accomplished using many pieces of equipment. Speedy-dry remains a staple for the common nuisance spill. Fibrous pads and "sausages," specifically designed to soak up or dike oils, acids or hydrocarbon liquid spills, are carried on the tender. Plastic sheets and bags remain a simple, yet effective, control material for a variety of materials. Various drums and bags are carried on the tender to over-pack released liquid and solid material that can be picked up.

- Meters employ various technologies that help identify and assist in the determination of the presence or absence of a material. The Tech Engine carries an MSA Passport five-gas meter (oxygen, carbon monoxide, hydrogen sulfide, sulfur dioxide and combustibility), an MSA photo ionization detector (designed to detect and quantify contaminants in the air), a Ludlum radiological detector and a chemical agent and irritant gas detector. Special "single gas" meters for ammonia, chlorine and hydrogen cyanide--all commonly found gases--also are carried. Additionally, identification may be done by using chemical classifying and pH paper that works similarly to a litmus test.

- The meters described above



Using a state-of-the-art metering device, a fully equipped and properly protected member of a Technician Engine Company surveys the air surrounding bags of unknown material.



The Haz-Mat Tender assigned to Engine 44.

Equipment is stored carefully on the shelves of a Haz-Mat Tender. The storage system is uniform among the Haz-Mat Technician units.

usually will determine the *quantity* of a material and aid with identification. The Tech Engine members then will refer to a veritable library of reference materials--most of which are textbooks--that is carried onboard the tender. These references are invaluable in determining the potential hazard posed and they contain information on virtually every chemical known to man. This is known as the "resource area" and one Firefighter may be designated as the Resource Firefighter at the scene, based on demands on the unit. Haz-Mat 1 will assume this position on arrival or while responding by employing the Department radio or Nextel.

- The Tech Engine is fully trained to establish and maintain a functional decontamination area. The components of such an area--water supply hoses and wands, brushes, detergents, bleach and collection reservoirs--are carried on the tender. This equipment is used primarily with their own chemical protective clothing (CPC) removal, but can be used on other responders and civilians prior to the arrival of a Decon Task Force.

**Note:** The FDNY haz-mat response plan uses 25 Decon Task Forces, each consisting of a SOC Support Ladder Company trained to a Technician I level, a Decon Engine Company trained to provide technical decontamination and a supervising Battalion Chief. They are geographically dispersed throughout the five boroughs to provide a quick response.

**Member safety--a benefit to all from increased haz-mat-trained companies**

A haz-mat incident is a threat to all FDNY members, as well as the general public. It is virtually assured that each Firefighter will be involved in at least one haz-mat incident of significant pro-

portion during his or her career. Frequently, these incidents are beyond the capabilities of the first-arriving units. It is imperative that the members of the Department be thoroughly familiar with the capabilities of each of the companies comprising the Haz-Mat Group, to seek appropriate assistance or render assistance where dictated by protocol or circumstance. A full knowledge of the FDNY response mechanism for hazardous-materials releases will allow the rank and file to function confidently and within reasonably safe limits.



Members are urged to read:

- "Meeting Expanding Challenges with Innovative Concepts: The FDNY Hazardous Materials Response Program," by Battalion Chief John J. Fanning (killed on 9/11), in the 1st/99 issue of WNYF.
- "FDNY Chemical Incident Tactics," by then-Battalion Chief Joseph W. Pfeifer, in the 1st/99 issue of WNYF.
- "Hazardous Materials Chemical Protective Clothing," by FF Jeff Borkowski, in the 1st/99 issue of WNYF.
- "Chilling Facts About Chiller Units--Tactics for Titanium Fires," by then-Lieutenant John Flynn, in the 2nd/2002 issue of WNYF.
- "SOC Support Ladder Company Training," by Lieutenants Joseph M. Jardin and William F. Ryan, in the 3rd/2003 issue of WNYF.

**About the Authors...**

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**Battalion Chief Robert Ingram** is a 23-year veteran of the FDNY. He is the Chief in Charge of Hazardous Material Operations. He has been an FDNY Haz-Mat Technician since 1984, serving as a Specialist, Lieutenant and Captain. He is a Master Instructor in hazardous materials for the International Association of Fire Fighters and instructs for both public agencies and the private sector. He represents the FDNY on the NFPA 472 Standard for Hazardous Materials Response and is the Chairperson of the Inter-Agency Board (IAB) for the Standardization of Equipment for CBRNE incidents.

