

What's Inside:

**YOUR TRASH TRUCK
WON'T FIT**

CHATROOM

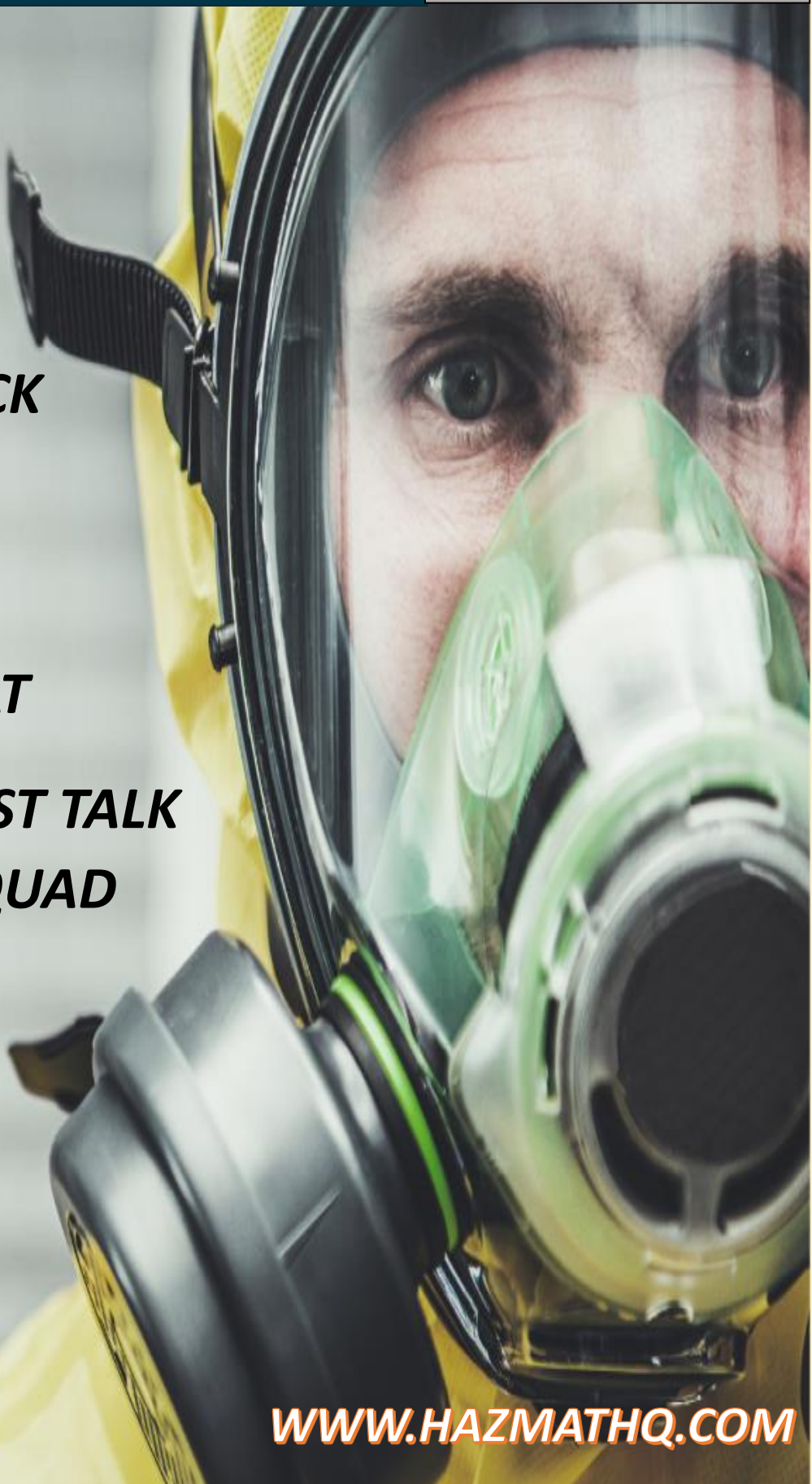
DRONES & HAZMAT

**WHEN DID YOU LAST TALK
TO YOUR BOMB SQUAD**

**HAZMAT VEHICLE
DESIGN**

Conference Updates

WWW.HAZMATHQ.COM





Editorial Staff

Bob Coschignano

Mike Bloski

Derek Schaumann

Contributing Writers

Rich Gatanis

Kevin Ryan

Ed Maerkl

Mike Luhm, Kevin Luper, Lane Best

HAZMAT HQ is a monthly publication geared towards the hazardous materials response community. The HAZMAT HQ Magazine does not assume liability for products or services advertised herein. The views expressed in the magazine are not necessarily those of HAZMAT HQ Magazine. While every attempt will be made to ensure the accuracy and authenticity of information appearing in the magazine, HAZMAT HQ accepts no liability for damage caused by misrepresentation of information, expressed or implied within the magazine. The content of HAZMAT HQ is copyrighted and is strictly prohibited to reproduce or transmit in whole or part of on-line or print without written consent of HAZMAT HQ magazine.

CHATROOM

Where should I start up my air monitor?

You can turn them on in the rig but don't fresh air calibrate or bump until outside in a clean environment.

Is there a reason for turning on so soon?

Yes, the longer the meter is running the more accurate it will be as it is now warmed up.

Where should I start to meter?

Best practice is to use the 30/30/30 rule. 30 seconds at the floor level than 30 seconds at middle level finally 30 seconds up high. This allows time for the meter to provide more accurate readings.

Your Trash Truck Won't Fit

By Kevin Ryan



Compressed Natural Gas (CNG) has seen an increase in use as an alternate fuel source. CNG trash trucks have been a common sight throughout the Baltimore area for more than 10 years now. The Baltimore City FD (BCFD) have had several responses involving these types of trucks. The use of CNG provides a

cleaner and cheaper alternative to diesel for heavier trucks. CNG is comprised of mostly methane to provide the clean burn. The key to preparing for a CNG incident is pre-planning, training and continuing education. Preparation for these incidents must also include networking and outreach with the companies running the trucks. These companies can provide expertise, additional knowledge and logistics for making the trucks safe. The trucks use a cascaded system of wrapped fiberglass cylinders that operate at a pressure of up to 3600 psi. Typical arrangements on trash pickup vehicles have up to 4 cylinders on the top of the vehicle. The control panel is located on the driver's side close to the ground between the vehicle axles. The valves allow for fueling\defueling as well as controlling the flow of gas to the engine. Drivers are instructed to shut off the flow of gas to the engine in any



emergency they encounter. Most incidents involving CNG trash trucks involve fire. Fires starting in the trash collected are most common. The BCFD has had several of these in the streets of Baltimore. Recognition of CNG being involved is the key to successfully controlling these incidents. Relief valves (fusible plugs operating at 220 degrees) must

be allowed to operate without interruption. Exposure protection is a primary response goal until the CNG tanks have emptied. Vehicle accidents can be controlled relatively easily unless specific circumstances exist such as damaged supply lines. Knowledge of the control valves would be essential to control the flow of gas to the damaged lines.



First responder training is a must to understand actions to take when encountering these vehicles under fire or accident conditions. All of the training and preparation described came together in June of 2023 in East Baltimore. A trash truck attempted to pass under a railroad bridge and did not have the proper height clearance. The truck became stuck, unable to move and the bridge supports damaged one of the high-pressure cylinders. The cylinder had a slow leak that was audible to crews on the ground. The driver was uninjured during the accident. The railroad bridge struck was a major line in the Northeast corridor of Amtrak service. Rail service from Boston to Richmond was shut down for almost 3 hours while the incident was cleared. The leaking CNG was migrating up through the openings in the bridge into the path of the trains. The first arriving engine company

quickly recognized the scope of the incident, requested a hazmat assignment and isolated the scene. A decision to defuel the cylinders on the scene was made given the cylinder was damaged and could not be controlled by the valves. The trash truck company service crew and flaring equipment from the Maryland Dept. of the Environment was utilized for the operation. A vent operation taking advantage of the lighter than air vapor density of CNG was completed within 45 minutes. Tanks were at 3\4 full at the start of the vent operation. Once the tanks were rendered safe, a local tow company began the process of removing the truck from under the bridge. Railroad engineers were on scene to evaluate the damage to the bridge. Key points to consider from this incident:

- Proactive training and awareness of alternate fuels in your first due. The BCFD has been training with this trash pick-up company since 2015. Cooperation has been essential in handling accidents and fires involving their trash trucks.
- Expect the unexpected. CNG incidents usually involve fire. Rare incidents like this one provide a challenge that demands a clear course of action based on solving the problem. A defueling operation was the solution for this incident to render the damaged cylinders safe for salvage.
- Specialized equipment needs. A specific part of the proactive training is recognizing and procuring specific pieces of equipment needed for scenarios such as this. CNG adapters, steel braided hose and flare stands may not be carried by all fire departments or hazmat teams. Purchasing

this equipment may not be an option for some departments. The next best option is establishing mutual aid agreements with departments or agencies that can provide this equipment in a timely manner for emergency response. The trash collection company is able to bring us defuel equipment except they have no one available to assist between 2300-0700 as their maintenance shop is closed.

Conversely, their trucks don't run in that time frame, however you need to know when your resources are available to you. MD Dept. of Environment is available 24 hours a day although response times can be 1 hour or more. Decision making must be adjusted based on what is available and how long it will take if you cannot provide the specialty equipment from your own department. Alternate fuel usage is on the

rise. CNG, LNG, Battery power and Hydrogen fuels will be seen in emergency response. Emergency responders will have to meet the challenge with proactive measures. The department that is training, planning and adapting will be prepared for the ever-changing world of alternate fuels.

Kevin Ryan leads the Baltimore City FD Hazmat Operations Office. A 31-year veteran of the fire service with 26 years of experience in the world of hazmat response. He is a Level III instructor and adjunct at the BCFD Fire Academy.

HAZMAT 101 CONSULTANTS PRESENTS HAZMAT OPERATIONAL REVIEW

Operational Class Topics:
Scene Management to include CO emergencies, Natural Gas leaks, Over the road haulers and CNG vehicle
2020 Emergency Response Guidebook.
Identifying Offensive/Defensive Strategies & Tactics.
Donning & Doffing of PPE (Including firefighter turnout gear).
Decontamination Procedures.
Lithium Ion Battery Fires
Basic Air Monitoring review of 4 and 5 gas
Detection equipment.

Contact us for more information on in person or virtual classes:
Bob@hazmat101consultants.com

HAZARDOUS MATERIALS IDENTIFICATION TESTING SYSTEM (HITS)

THE BASICS OF RESEARCH IS ONE OF THE MOST IMPORTANT BUT CONFUSING SUBJECTS ON A HAZARDOUS MATERIALS INCIDENT. USING THE HAZARDOUS IDENTIFICATION SYSTEM (HITS), THE TECHNICIAN WILL BE ABLE TO IDENTIFY CHEMICAL PROPERTIES OF A SUBSTANCE OR COMPOUND BY SIMPLE FIELD TESTING IN LESS THAN 15 MIN. CONTACT US FOR MORE INFORMATION WWW.HAZMAT101CONSULTANTS.COM

High gas alert
VOC ppm 81.5
O₂ %vol 20.9
LEL % 0
CO ppm 0
H₂S ppm 0.0

Strategies & Tactics of Air monitoring and more
www.hazmat101consultants.com

Unmanned Aerial Systems Inside Flammable Atmospheres:

By Rich Gatanis

Imagine waking up to the sound of alert tones blaring through the fire station at 3:00 AM, accompanied by the announcement "*All units be advised: reports indicate a large cloud*



of smoke or gas coming from the facility." In that moment, your heart rate surges from 60 to 120 beats per minute. When you hear the address come across the radio, you know that this is the call that you hoped would never come in during your career. The facility in question has one of the nation's largest

stockpiles of anhydrous ammonia, making it a uniquely dangerous situation. This is the nightmare scenario that keeps those in the hazardous materials (HazMat) industry up at night.

As the number of HAZMAT calls continues to rise, the team at Southern Manatee Fire Rescue (SMFR) is all too familiar with the challenges they present. Manatee County, Florida is home to hundreds of industrial facilities, many of which store a variety of chemicals, flammable liquids, and gases onsite. The potential for a "worst-case" scenario at these facilities poses a significant risk to both

first responders and the citizens they protect. As a progressive HazMat agency, SMFR developed a UAS program to augment our hazardous materials response. The goal is to use UAS to respond to situations like the one described above. However, introducing the idea of flying drones into hazardous environments presented a multitude of challenges to the traditional "hazardous materials response" mentality. Our ideas faced significant scrutiny from seasoned industry professionals, and rightly so. However, their challenges of our work to bring UAS to the



forefront of HAZMAT response helped us develop and test the robust UAS/HazMat response matrix that we operate today.

One of the most important questions we had to answer was, "What happens when we fly a drone into a flammable atmosphere?" It was a critical hurdle to overcome since most of our missions put our aircraft into unknown atmospheres. The potential for us to introduce an ignition source into a flammable atmosphere is concerning. However, the ability to remotely send a piece of equipment into the scene to detect potential flammable gases is a game-changer.

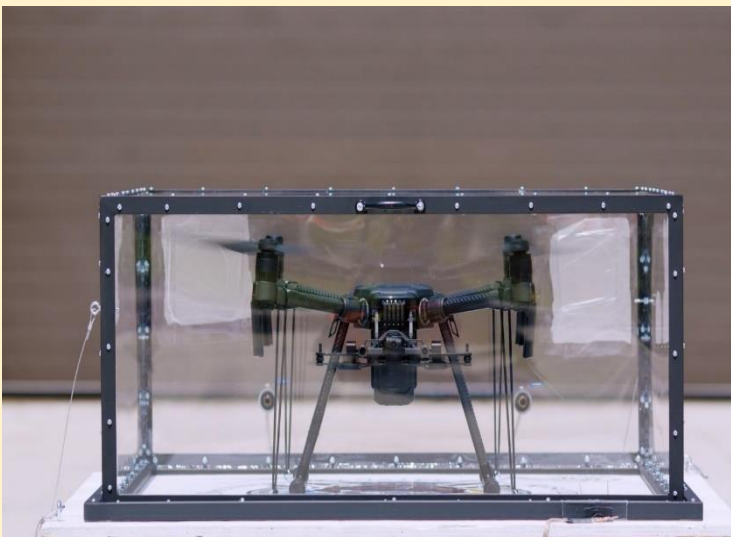
We clearly do not condone flying drones into flammable atmospheres. Our concern is in the utilization of drones during a HazMat event that could inadvertently place our aircraft into

a flammable gas. As UAS are inherently non-intrinsically safe, we need to know what would happen. Therefore, we developed a test.

Testing an unmanned aerial system within a flammable atmosphere is no small task. We had to answer many variables before implementing the first test, not to mention the inherent danger in this type of testing. After conducting a series of smaller scale tests, we developed a repeatable and standardized test, known as "The Box." The Box was designed to be strong enough to withstand an explosion yet made of clear Lexan to allow us to see/video the test results. With some careful engineering, we had our box.

Let us revisit the "dangerous" part of this test. Placing potential ignition sources inside highly flammable atmospheres is something you

might find on the hit television show MythBusters, not in the back parking lot of a fire station. We took this part seriously, putting months of thought into the safety of our tests before conducting the first test. Because we planned on filming our tests to share with other agencies, we decided to run our tests "MythBusters" style. The thought being that if the aircraft did not ignite the gas, what better way to demonstrate that the atmosphere inside the box was flammable than to blow it up in true MythBusters style?

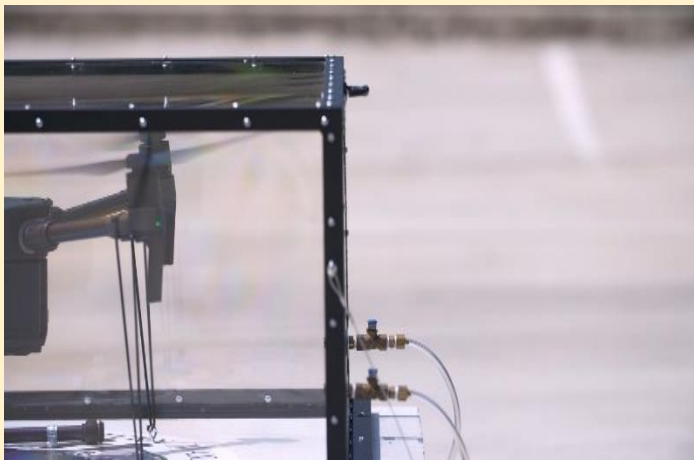


In 2016, we conducted our first test using a DJI Inspire 1 drone in a box that we hastily built. Later on, we improved the design

to make it reusable for future tests. We used LPG gas for the test, which was the easiest to obtain. The details of the test method and results (for all of our drone flammability tests) can be found on our YouTube channel

[SMFR911 - YouTube](#) but what is important to

note is that the test was a huge success. The drone passed the test, and we proved the atmosphere inside the box was flammable by



blowing up the drone.

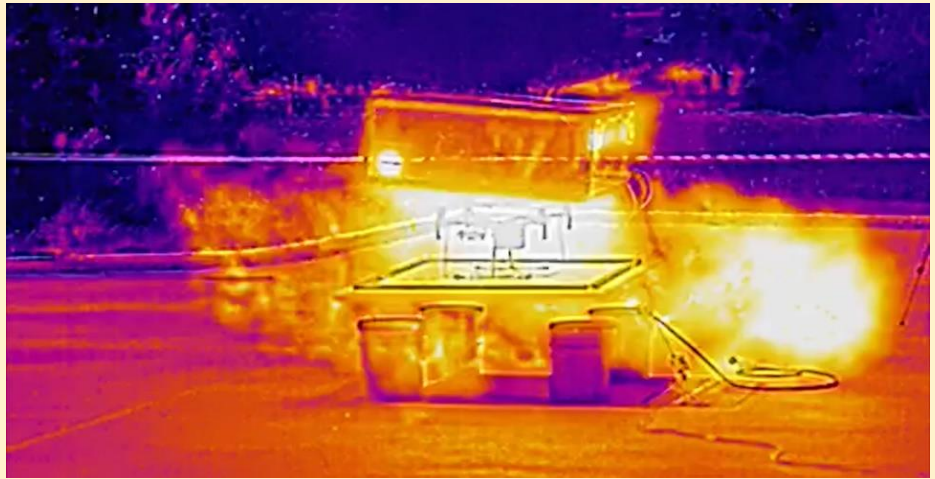
As our fleet expanded, we needed to test other aircraft. We

pitted the DJI Matrice 210 and Mavic Pro

against the newly redesigned box. Our testing gained



recognition in the industry for being at the forefront of drones in hazardous materials response, catching the eye of DJI. This led to an R&D partnership

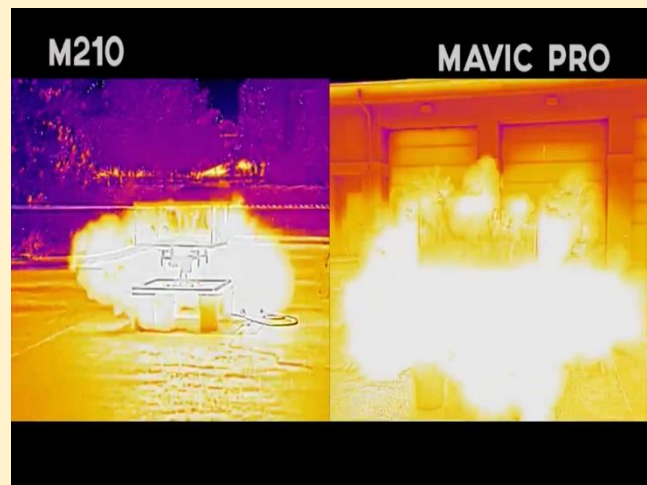


with DJI to develop a system that meets the harsh requirements of hazardous materials response and better understand how unmanned aerial systems (UAS) can help HazMat teams. DJI even created a few "Use Case" videos and filmed our flammability tests on the M210 and Mavic. These tests were a huge success, which supported many agencies in the US and abroad to move forward with UAS programs to aid their HazMat teams.

Our testing's popularity has created a lot of interest from equipment manufacturers that may not necessarily pass the Underwriters Laboratory (UL) threshold of intrinsic safety. Recently, Squishy Robotics, a new company that developed a drone-deployable flammable gas detector, decided to test their robot in "The Box." For manufacturers like Squishy Robotics, this testing proves they are on the right track towards their UL certification. Many other UAS manufacturers have also approached us to have their drones tested in our facility.

As public safety agencies begin to adopt the use of drones, there is a growing potential for these systems to be deployed in hostile and dangerous environments. Therefore, it is crucial to understand the limitations of the equipment when using them in such scenarios.

Unmanned aerial systems (UAS) are relatively new to public safety and are being pushed to their limits, performing tasks never before imagined. Consequently, grassroots testing is essential, given the rapid pace at which the industry is evolving, much faster than the traditionally slow-to-embrace fire service.



When Did You Last Speak to Your Bomb Squad?

By Edward J Maerkl, MS

Hazmat & Public Safety Bomb Technician

When did you last speak with, or even better, train with your local bomb squad? If you have not, there is no time like the present to reach out. 90% of bomb squads are housed within law enforcement agencies. The remaining 10% are part of fire departments. Believe it or not, but the hazmat and bomb squad missions have a great deal of overlap. Here are some ways in which we can integrate.

Often, things like clandestine labs are key points of intersection, where there are chemicals and chemical compounds in various stages of development that require

stabilization and identification. While public safety bomb technicians are currently required to be hazmat technicians, their level of training and comfortability with hazmat mitigation may vary. Hazmat teams may provide decontamination resources, additional metering, monitoring, and presumptive identification resources, to name a few.

On improvised explosives device or suspicious item calls, my home agency utilizes firefighters from the hazmat team in order to provide material and manpower support; that is units from the hazmat team and fire suppression units. Suppression units are used for decontamination and fire suppression purposes, while the hazmat team is used to supply metering technology for an “unknown” hazard. Additionally, the hazmat team provides a rapid intervention team (RIT) for the bomb



technician operating. They conduct chemical warfare agent screening prior to entering cold zone. In the event of an unplanned detonation, they

respond at the direction of command, and are outfitted with a SKED, fire extinguisher, and a specialized trauma medical kit. For PPE, they wear full bunker gear and air pack. It is vital for fire departments and/or hazmat teams being used for the purpose of rapid intervention teams during IED or suspicious item incidents, crews have some advanced training in how to best package a downed bomb technician, as well as having an understanding of the “stay and play” versus “load and go” algorithm.

For hazmat teams, your local bomb squad can assist in providing explosives subject matter expertise on unknown hazard calls, as well as remotely operated vehicles such as



robots, and in some cases drones. While some drones are becoming capable of carrying detections equipment, I am unsure that the technology is fully developed. On the

robots' front, unmanned metering and monitoring can take place. A robot could recon and deliver readings in unknown or high hazard environments. I also think of remote monitoring devices such as Area Rae, Blackline or the like. Area Rae and Blackline monitors

could be delivered robotically rather than endangering human lives. Obviously, there are limitations to everything; robotic radio communications may interfere with initial monitoring and other communications devices.

While this is a very high-level article, it is meant to provide a general overview for both hazardous materials teams and public safety bomb squads, in order to get agencies of either persuasion communicating and training in advance of the calls.

*Ed Maerkl has been in the fire service for 27 years and in Special Operations (HazMat) for 24 years.
Ejmaerkl@gmail.com*

Editor's Note: Due to Operational Security, many photos of this integration are not shown.

Dallas Fire Department

HazMat Tiller Truck 3

By Mike Luhm, Kevin Luper, Lane Best



City of Dallas Fire Rescue hazardous materials response team HMRT is not only an asset to all 385 square miles of Dallas, but also all 12,500 square miles of the North Central Texas council of governments. This is an area equivalent to the state of Maryland with an estimated

population of 8.1 million. Dallas Fire Rescue HMRT is a FEMA type 1 team with the



capabilities to detect, identify, and mitigate chemical, biological, radiological, and nuclear substances on HazMat / WMD incidents. Dallas Fire Rescue HMRT staff fire station 3 with a total of 36 hazmat technicians over three shifts 24/7. These team members are adept at seamlessly working with local, state, federal, and community stakeholders. Currently when the HMRT receives an emergency response, the truck company dismounts from truck 3 and staff

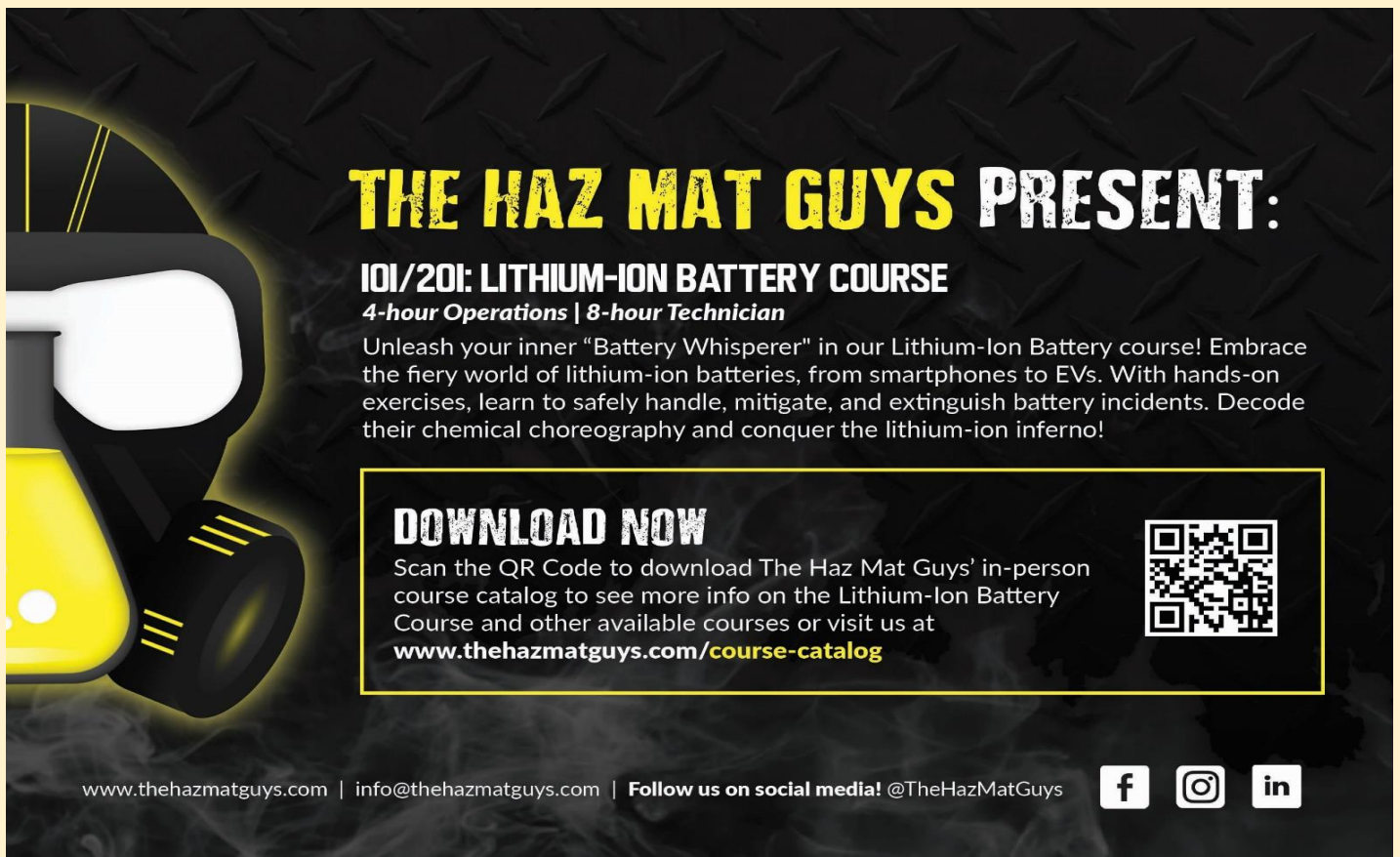
hazmat 3 and support 3. These units respond in concert with engine 3 and rescue 3 while always striving for efficiency and increasing the team's operational capabilities. The HMRT began to realize the unique advantages that a tiller style body will provide the program. New hazmat 3 will combine both hazmat 3 and support 3 into a single apparatus which cuts down on maintenance and fuel costs or department and will reduce the department's operational footprint while responding and when on scene. While the recent edition. The new hazmat 3 also allows for compartments lower to the ground. Dallas Fire Rescue HMRT's plan is to utilize the city of Dallas unified command vehicle one on all Level 3 hazmat incidents and events as needed. The flexibility of the tiller platform will also afford the HRT the maneuverability needed

Enhancements:

- Climate control research module with all monitoring and sampling equipment secured and charging. In the 2011 model this was not possible.
- Increase the volume of storage and bring it lower to the ground with external access for safety and efficiency of team members.
- Increased capability with more powerful compressor for multiple simultaneous drilling and pump off operations.
- Increase mobility throughout the city of Dallas.
- Ability to quickly pin tiller axle if traveling to farthest location (E.G, Comanche peak nuclear power plant)

- Moves all weather exposed equipment from support three into an internal storage on hazmat 3.
- Quieter and more easily accessible generator for preventative maintenance and less noise on-scene.

For more information Contact DFD Station # 3 (HazMat Station) 500 N. Malcolm X Blvd., Dallas, TX 75226




THE HAZ MAT GUYS PRESENT:

IOI/20I: LITHIUM-ION BATTERY COURSE
4-hour Operations | 8-hour Technician




Unleash your inner "Battery Whisperer" in our Lithium-Ion Battery course! Embrace the fiery world of lithium-ion batteries, from smartphones to EVs. With hands-on exercises, learn to safely handle, mitigate, and extinguish battery incidents. Decode their chemical choreography and conquer the lithium-ion inferno!

DOWNLOAD NOW


Scan the QR Code to download The Haz Mat Guys' in-person course catalog to see more info on the Lithium-Ion Battery Course and other available courses or visit us at www.thehazmatguys.com/course-catalog



www.thehazmatguys.com | info@thehazmatguys.com | Follow us on social media! @TheHazMatGuys



CONFERENCE DATES



The Politics of
Hazardous Materials

Florida HazMat Symposium
Jan 16th – 19th 2024

Massachusetts HazMat
MAHMT
Mar 26th – 28th 2024

Michigan HazMat Responders
Conference
Apr 15th – 17 2024