

What's Inside:

CHATROOM

So, you want to be a HazMat Medic? PT2

Revolutionizing the Way we respond:

Telepresence Response across a Nation

The Only Way to Win

Vapor Pressure – the key to

HazMat Response

Conference Updates

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CHATROOM

Is there a set number of hours required to be a HazMat Technician?

No. OSHA 29 CFR 1910.120 makes reference to The HAWOPER standard of 24 hours with additional 16 hours in practical competencies as a requirement. However, the AHJ can raise the amount needed for their agency.

Is there a national standard?

Unfortunately, no! That said, most fire departments set 160 hours as a standard but that is what we like to call the minimum level. There are many classes across the country that enhance that base knowledge. Again, hours are generally speaking, still left to the AHJ.

So, you want to be a HazMat Medic? PART 2

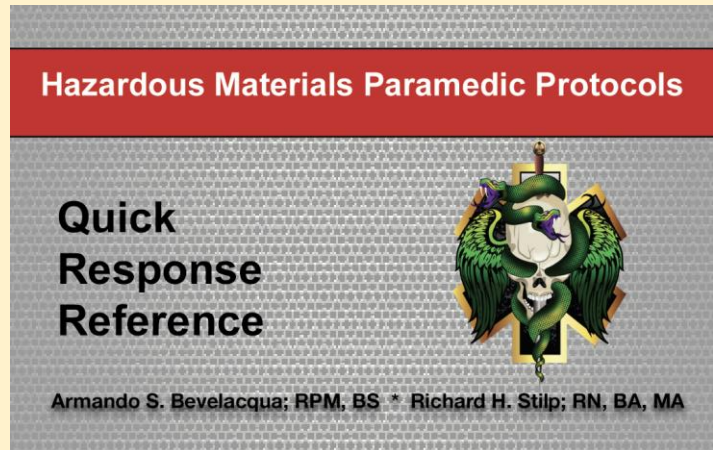
*By Armando S. Bevelacqua,
City of Orlando Fire Department, Retired District
Chief of SOC*

We started this column with a general overview of what a hazmat medic is all about. We approached the question of, “***What is a hazmat medic?***” in the most general terms. In this article, I would like to give some details about the roles and responsibilities a medical provider may have at the HazMat event. But before we dive into this, let me clear up one significant point and that is training and the training levels.

Although a HazMat Medic as a certified medic and HazMat Technician as the preferred level of education, an EMT with Hazmat

Technician working under the guidance of the hazmat medic is perfectly acceptable. But what about the third service agency that only provides EMS level response and no or limited Hazmat training, but they are called to the HazMat scene so that the Incident Commander can check off that box! These folks are fully capable of providing care to the hazmat team if, and only if, they are properly trained. A third service paramedic should have HazMat Technician or, at the minimum, Operations mission specific so they understand the hazmat complications.

A third service EMT or Paramedic can have the level of training that would complete the true task of medical support at the incident. However, the local system would like to organize their service is up to the authority having jurisdiction. Training along with the proper personnel supplied with an acceptable level of equipment is a must. Train your personnel to what level you expect them to perform and give them all the tools so they can perform that level of service. I know it sounds simple and it is, but there are so many agencies that fail in either equipment provided, not enough training or worse yet not enough people to perform the task.



What is the list of responsibilities and what are the roles of the HazMat Medic?

1. **Research** - Looking up the chemical and physical properties and the associated toxicology to formulate a medical plan of action. Just like the Incident Commander has the responsibility to generate an Incident Action Plan, it is the medical practitioner at the hazmat event that should generate a **Medical Action Plan**. If an exposure has occurred and no plan; you're behind the eight ball.
2. **Anticipation of medical needs** - This is an analysis of the scene to see what level of potential exposures you have or could you have in the immediate future. Can you provide the level of medical care and what tools do you have or are needed to accomplish the role of patient care, i.e. enough antidotes.

3. ***Pre/post entry physicals*** - There is an argument out there in the hazmat arena that pre-entry physicals are not needed. One can argue that because you have a medical fit for duty physical once/twice a year or every other year. This would accomplish the pre-entry physical, and at face value you have a good argument. However, it is not entirely justified. The pre-entry is not just a gathering of vitals (which so many responders focus on that) but rather the person as a whole. My example is that a responder has just been trained as a HazMat Technician and this is his/her first real job, his vitals are going to be all over the board. But you know the responder and you know that this is due to nerves. Second is the fact that it is a OSHA requirement and to be honest it is just prudent to medically evaluate your personal at all emergency scenes.

4. ***Post Entry and Heat Stress*** - I am going to identify this one specifically as this area is become a significant health and safety concern. Evaluation of your personnel is vital in relation to potential heat stress issues. We see after fires, extended extrications, Technical Rescues and HazMat are all incident types that can produce a heat emergency. We also see that responders have a higher tendency towards heart attacks, during these dehydration states. Rehabilitation, the most important job at any emergency scene also comes with a heavy medical component to it which for the most part is being missed and ignored. Cooling the responder, immersion



baths, cooling tents along with pre-entry hydration all can have a positive influence at the scene of a hazmat event.

5. ***Treatment*** - This is the one area that most focus on and to be frank it is the least actually used. But treatment comes in several forms. It may be as subtle as evaluation after event such as in the rehabilitation section, or as aggressive as giving an individual antidotal medication.
6. ***PTSD and Peer support*** - Just like any area of emergency work we see bad things. Things that most people think they understand but they really do not. If you have been a responder for any length of time you have memories, some good some bad. And it is these bad events that over time will accumulate and have an effect on you. My analogy is that you start in the emergency services with this ball of emotional twine, and

as you go through your career you give that emotional twine away. Until one day you look inside and see that once large ball of emotional twine seems so much smaller, you continue until you now know that the ball is so small you need all of it for yourself. And that is where Peer Support comes in.

Responders that have been where you are at understand and can help with that emotional ball of twine. They can help repair to a certain level what is needed to maintain and continue in the emergency services and in life in general.

7. ***Medical advocate*** - Medics that are specially trained in this field are not your average medic. They gravitate towards helping under a variety of conditions. This responder not only assists at the scene of the emergency but also assists at the receiving facility. They have strong communication with

the emergency department and more than likely have worked within the ED. They have proven themselves in the eyes of the emergency department staff. They then can assist in the medical plan of an injured responder, forming a liaison between the agency and the hospital.

This list is the basis for the responsibilities of a Hazmat Medic. It is the short list. As started before it all depends on the level of service you plan to provide. However, this list is the minimum required level of service for hazmat medicine.

Armando S. Bevelacqua is 37 plus year veteran of the fire service. Retired from City of Orlando Fire Department, Orlando Florida where he served as Chief of Special Operations, Homeland Security and Emergency Medical Services Transport.

Armando also teaches at local colleges, instructing Fire and EMS Classes. Armando lectures to fire departments throughout North America, Canada and Europe. He is an adjunct instructor through

the Department of Defense as well as with several federal agencies involved with forced protection.

Chief Bevelacqua serves on several federal, state and local committees. He held membership of the Inter-Agency Board (IAB) for Training and Exercise development. Technical Consultant and member to the NFPA 470 (472, 1072, 473), and 475 Technical Committees along with representation on the ASTM standards development committee for emergency response.



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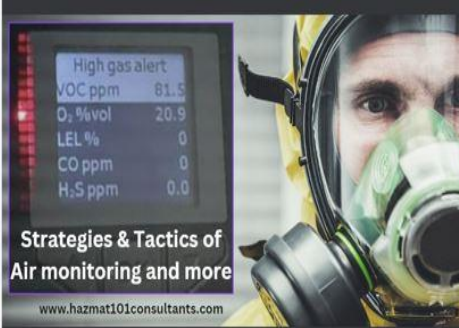
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Revolutionizing the Way we respond: Telepresence Response across a Nation

*Authors: Violet DeStefano Public Affairs Officer
Hazmat 2 Environmental Fire Rescue Benjamin
Herskowitz Chief of Department Hazmat 2
Environmental Fire Rescue Caption*

This year marked a milestone in the realm of emergency response. Hazmat 2 Environmental Fire Rescue (Hazmat 2 EFR), an all-volunteer Hazardous Materials Team in Lancaster County, Pennsylvania, was able to showcase their telepresence response capabilities on a National Level. Through their participation in an exercise at the Safety and Emergency Response Training Center (SERTC), Hazmat 2 EFR was able to demonstrate their telepresence skills from across the Nation.

Hazmat 2 EFR's Telepresence Unit had the opportunity to play a role during a train derailment training exercise. Three team members from Hazmat 2 were selected to attend PER-290: Tank Car Specialist Course, a course that was generously sponsored by Norfolk Southern at SERTC in Pueblo, CO. The week-long training culminated with a full-scale exercise, involving a simulated 35 Tank Car Derailment. While this may seem like a standard full-scale exercise, the innovation came from the involvement of 10 Hazmat 2 EFR members who operated from remote locations across Pennsylvania: spanning the regions of Lancaster and Allegheny County. This feat could not have been possible without the application of telepresence technology.

Telepresence Team Activation

Hazmat 2 EFR's Telepresence Unit began the exercise with minimal information, a set of latitude and longitude coordinates of a rail car and a solitary photograph of the scene. While the on-site personnel simulated response to the scene, the Telepresence Unit was allowed a 40-minute head-start.

Telepresence Unit Members were able to provide technical information that supported the on-site team. Initial activities included the simulated use of AskRail to acquire the trains consist. With the data provided, Hazmat 2 EFR's telepresence unit provided off-site technical research and real-time information to the on-site first responders located in Colorado. Information shared included crucial data ranging from what materials were in rail

cars to essential safety information for responder health. CERES was also used to send a basic weather-based model to recommend the direction of response to the scene.

Once crews were on scene, the Telepresence Unit continued to provide chemical property data to guide personal protective equipment selection and tactics. Entry Teams then made their way downrange, equipped with cellular devices to stream live images and video back to team members. In addition to audio, images and video, other collaborative tools were used to keep data organized during the response.

This use of telepresence technology was instrumental in bridging the gap between experts stationed miles away and the on-site responders. Utilizing telepresence technology

aided in the dissemination of critical information swiftly and accurately, facilitating a more efficient response to emergency situations. This unique approach not only showcased the power of cutting-edge technology but also highlighted the expertise of Hazmat 2 EFR's team members.

This training exercise illustrated the power of technology and the unwavering commitment of those on the front lines of emergency response. Hazmat 2 EFR's Telepresence Unit has helped to redefine the landscape of emergency preparedness, promising a safer and more effective response to future incidents, no matter the location.

Where it began

Hazmat 2 EFR began their Telepresence Unit in 2015 as a way to retain technical expertise of volunteers who moved away from the county. Recruiting from colleges and universities yielded bright, young creative talent. However,



after 3-5 years of training and refinement, many moved away from the area, resulting in a significant

loss for the team. A phone tree was developed with and then later transformed into a self-hosted Internet Protocol Private Automatic Branch Exchange (IP PABX) phone system with the help of a local business, Hempfield Tech. This was implemented to maximize the

efficiency of call routing and the system's overall effectiveness.



Today, if a member is in need of reaching a Radiological Response Specialist or a Chemist, there is a single phone number to call. The IP PABX system is

programmed based on the training level of responders, and the program is able to identify who is available for a phone call. The IP PABX is built to identify and ring specific groups based on expertise, with the goal of increasing the speed of finding an available specialist. The system has proven to be faster than ringing through a traditional sequential phone list.

Where we stand today

In recent history, Hazmat 2 EFR was dispatched to a building fire at a fertilizer plant. Initial reports to the Hazmat Team indicated that the items on fire in the building were unknown. As well, a Firefighter on scene experienced severe burns on his turnout gear. The first arriving Hazmat Supervisor was handed 80 SDS Packets as a baseline to identify the chemicals of concern.

While having a considerable number of unknown chemicals would be overwhelming for one responder, it was easily handled by many. Five telepresence unit members, in three counties, were able to support the incident. Each member was provided a secure web-folder, a spreadsheet to collaboratively work on, and their independent research

assignments. Within 20 minutes, the team was able to identify the top chemicals of concern.

As Hazmat 2 EFR continues to grow, many members have crossed State Lines. Based on the relationships the team has cultivated and the significant capabilities of the Telepresence Unit, the team has been brought in for assistance and consultation by first responders across the Nation. After conferring with our legal team, Hazmat 2 EFR has been able to confirm that the Telepresence Unit can provide assistance across the United States. To date, the Telepresence Unit of Hazmat 2 EFR has been able to provide assistance to Hazardous Materials Teams in six States.

This unit would not be possible without our dedicated first responders, Hazardous Materials Specialists and Local Business

Partners. The possibilities are endless as the team continues to develop its Telepresence Unit and strengthen our response capabilities. Hazmat 2 EFR continues to build our capacities for not only the local Lancaster County, Pennsylvania community, but for the Nation.

To learn more information, please email our team at info@hazmat2.com.

Still image from the live video of the damaged rail cars that were transmitted out to The ICP and the Telepresence unit by multiple entry teams simultaneously. Caption: Color coding helps to keep digital data on the 35 rail cars organized. Captain J. Knapp tracks reported damage and mitigation efforts on the whiteboard

Caption: This photograph and a single GPS coordinate is all that was given to the telepresence unit in PA. From this photo the ask rail app (simulated) was used to get the other cars in the train.

Real time data on the chemicals, reactions, PPE and plume model were then provided to the Teams in CO.

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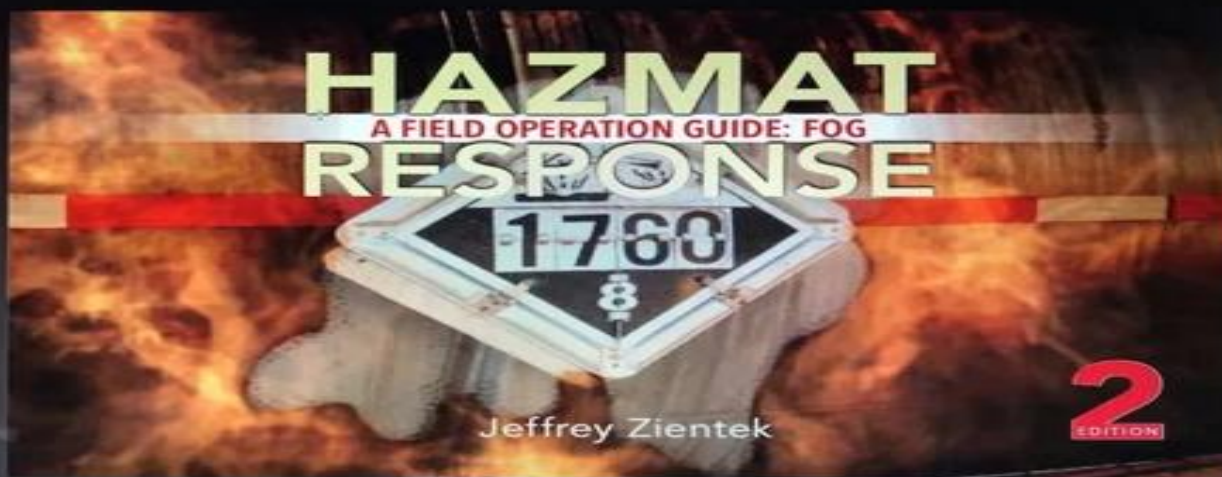
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This guide serves as a quick reference for First Responders, Emergency Response Technicians, Hazardous Materials Technicians, or any members that respond and deals with hazardous materials incidents. The guide includes many chapters such as Team organizations, helpful hints for common incidents, placards/GHS, rail and motor carrier identification, chemical reference, CBRNE, and much more. This guide is a must for emergency response personnel.

THE ONLY WAY TO WIN

By Kevin Ryan

In the December edition, I wrote about making the wise investment in your members as a leader. The article ended by stating when the team wins, you win **#winning**. The winning hashtag gets thrown around the Baltimore City FD Hazmat Operations Office when a success is encountered. Success is determined by the yardstick you use to measure it. Framing your successes in a positive manner refocuses your team. A focus on succeeding allows it to expand. A principle in the psychology world says what you focus on expands. My personal experience finds this to be true. I always try to use positive terms. There is plenty of negativity in this world so it's refreshing to be absolute.

Larger scale success such as handling a dangerous incident usually starts with small victories along the way. Here is a good example of what I am referring to. Every Tuesday is training day for the BCFD Hazmat Team members. Relevant training that is quality and timely is provided each week based on the shift working (The BCFD has 4 shifts). Sessions last from 45 to 90 minutes depending on the topic involved. Quality is the main goal when our training is delivered, regardless of time. A productive 45-minute session can be just as powerful as a 90-minute session that just fills time. A training session that goes well and engages the members is a small victory each week. Eventually these small victories translate into big wins when it's, "*Go Time*" for real. The small wins we get every week in training equal out to larger success when the game is on the

line. The members of the BCFD Hazmat have come through in the clutch with several notable incidents this year. Incidents involving nitric acid, suspicious letters, mixed chemical reactions and others have challenged us.

The hashtag **#winning** has been used a good bit by us this year. The real reason that we are winning is because the team is winning.

Success cannot be claimed by just one person.

The only way to win is to trust the member next to you. Specifically, I am talking about relying on the member next to you to do their job. Every member has a role to play on the team.

Leadership is the mechanism by which winning is possible. A leader must set a playbook for the members to follow then step back and allow the players to execute. Deputy

Chief Hudgins, in charge of SOC, has given us what we call the “Hudge’s 9 Pillars of Success”. The 9 pillars are a playbook of what is expected from our leader. The real brilliance in these is how simple and easy to follow they are.

These are the “9 Pillars of the Hudge”:

1. *Just do your job*
2. *Loyalty is important*
3. *Keep him informed*
4. *Keep it simple and minimize the show*
5. *Be nice: to the chain of command and to the public*
6. *Be there for the members, listen to them*
7. *Look good, optics are everything*
8. *Never underestimate the ability to gauge how an individual will think or act*
9. *It goes through his command before it goes to someone else’s*

Here is my take on each of the 9 Pillars:

1. *Keeps you focused on your role in the team*
2. *To the team, to the Chief*
3. *No Chief likes to be surprised*
4. *Be as efficient as possible*
5. *Respect goes a long way whether it's with another member or the public*
6. *Take input, check the ego, someone else may have a better option*
7. *Poor optics can ruin an operation even if false*
8. *The most powerful skill you can develop is to be able to read people*
9. *The Chief should never be undercut by another, we work for him.*

The leader has the obligation to set the standard for the team. Expectations such as the ones detailed above clearly set a high bar

for our SOC teams. Subordinate members in the chain of command have the obligation to lead up and down the chain. Military leadership books detail this concept, most notably in the *Extreme Ownership* series (I highly recommend these books). A company officer or crew leader is key in this role. This member needs to be willing to take the direction from above but also set the pace for their crew. The crew leader's job can be made more difficult or easier depending on direction from above. Directives that are concise, achievable yet flexible allow the crew leaders to perform and raise the standard. In my experience, micro-managed crew leaders lack creativity, have no gumption and always strive for the minimum. Crew members are the backbone of any team. These are the ones that do the dirty work at every incident. They train,

learn and come through in the clutch. Several of these home run hitters have surfaced in our incidents this year.

Assessing our members in training allows us to employ their strengths and weaknesses.

Training is key as it allows us to assess our weaknesses then attack them to raise the standard. A team is only as strong as its weakest link. We are fortunate in the BCFD to have highly motivated members at all levels of Hazmat. In the grand scheme of hazmat response, the real winner is the public we serve. Respect and trust the members you train with at all levels, the team wins, you win

#winning

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.

Vapor Pressure – the key to HazMat Response

By Chis Hawley



When training to become a Hazardous Materials Technician, there are a lot of terms one must learn. In addition to all the terms there are a lot of concepts and response techniques to learn about. But out of all a hazardous material's chemical and physical properties, vapor pressure is the key term and really is key to any response. In general, if a product has a high vapor pressure, it can be very dangerous to deal with. A material with a low vapor pressure has lesser concerns, as least related to vapor

production. Vapor pressure has to do with the amount of vapors that are released from a liquid or a solid. The true definition is the pressure that is exerted on a closed container by the vapors coming from the liquid or solid. You can relate vapor pressure to the ability of a material to evaporate, as the material is not disappearing but moving to another state of matter.

Note: When gasoline evaporates it has not gone away, it has just changed its state of matter, and, has become more dangerous.

So, when we look at a risk-based response, we want to categorize chemicals into one or more of these categories: fire, corrosive, toxic, radioactive and oxidizers. Once we are armed with the risk category of a chemical present

and we know the vapor pressure we can determine proper PPE, isolation distances and the severity of the incident. More information would certainly be helpful, but not necessary to act. Once we identify the risk and how aggressive a material is we can act. Using a suite of instruments and testing paper we can determine the risk category. An LEL sensor determines fire risk, pH paper indicates the corrosive risk, photoionization (PID) detector determines the toxic risk, a radiation pager/monitor determines the radiation risk and oxidizer (Ki) paper determines the oxidizer risk. These instruments/tests should be used on every response.

Pressures (vapor) are measured in several ways: millimeters of mercury (mm Hg), pounds

per square inch (psi), torr, barr, kilopascals (kPa) and atmospheres (atm). The most common is millimeters of mercury, and when levels exceed 760 mm Hg the values are generally expressed in atmospheres (atm). Normal atmospheric conditions are listed here; materials with vapor pressures at or above these levels are usually gases.

760 mm Hg = 14.7 psi = 1 ATM = 1 Torr = 1 bar = 101.33 kPa

The typical temperature provided by references is 68°F (20°C). If a temperature is not provided, then it can be assumed to be 68°F (20°C). Temperature has a direct relationship with vapor pressure. The higher the temperature, the more vapors will be produced. Conversely, the lower the

temperature, the lesser amount of vapors that will be produced. In situations such as a chemical spill in a building, the decrease in temperature can aid first responders by reducing the amount of vapors. HAZMAT responders can use elevated temperatures to remove a chemical from a building, and this tactic is used occasionally. Chemicals that have a significant vapor hazard are those more than 40 mm Hg as they are considered volatile. Chemicals with a vapor pressure of less than 40 mm Hg do not present an inhalation risk but they may present toxicity through skin absorption or ingestion. Chemicals with a vapor pressure above 40 mm Hg can be considered inhalation hazards in addition to any other route of exposure they may possess. When materials become vapors, they present

more risk to us and are not easily controlled. The vapor pressure of water is ~ 20 mm Hg, and so we relate vapor pressures to this material. When a spilled material has a vapor pressure less than ~ 20 mm Hg, it will remain as a liquid longer than a given amount of water. If a material has a higher vapor pressure than water, then it will turn to a gas faster than the same amount of water. At 68°F (20°C) a cup of water will take at least a couple of days to evaporate. The same amount of gasoline will take a few hours to evaporate, which means that vapors (therefore an inhalation/fire risk) are being produced at a faster rate. Ethyl ether will only remain in liquid form for a few minutes as it has a high vapor pressure. Materials such as liquid chlorine, a gas that must be put under pressure to liquefy, will

instantly turn to a gas upon release. On the other hand, sulfuric acid has a very low vapor pressure and only presents a contact hazard. It would take a long time for the acid to turn to the vapor form. Pure sodium hydroxide needs to be heated to 2534°F (1,390°C) for even a small amount of vapor to be released. These two materials present a minor vapor hazard, as they have extremely low vapor pressure. We know as responders that when something is heated to 2534°F (1,390°C), it is probably on fire and there are more issues to contend with other than a small amount of sodium hydroxide. The pesticide ethion has an even lower vapor pressure and will remain liquid for a long period of time, extending to months. The true hazard from ethion is from contact, not from inhalation.

Example Vapor Pressures

Ethion = 0.0000015 mm Hg

Sulfuric acid = 0.001 mm Hg

Sodium hydroxide = 1.5 mm Hg

Sarin nerve agent = 2.9 mm Hg

Diesel fuel = 5 mm Hg

Water = ~ 20 mm Hg

Isopropyl alcohol = 33 mm Hg

Hydrochloric acid = 40.5 mm Hg

Acetone = 180 mm Hg

Gasoline = 300 mm Hg

Ethyl ether = 440 mm Hg

Chlorine = 6.8 ATM (5,168 mm Hg)

Propane = 8.4 ATM (6,384 mm Hg)

Anhydrous ammonia = 8.5 ATM (6,460 mm Hg)

Vapor pressure is the force that is coming off a material and is related to another term, volatility. In many cases these terms are used interchangeably, which is a mistake. Volatility is the weight of vapors that are coming from the material. Both vapor pressure and volatility are interrelated, but they are not the same thing. In most cases the relationship is consistent, as most high vapor pressure materials also have high volatility, but this does not hold true for all materials. Xylene, for example, has an extremely low vapor pressure (9 mm Hg) but is a flammable liquid that evaporates quickly. There are two reasons for this: high volatility (39,012 mg/M³) and the makeup of the molecular structure. The

chemical structure is a benzene ring which is a major factor in its being a flammable liquid.

In the HAZMAT world there are many gray areas, and we just navigated through one, as this is an example of how vapor pressure offers some information on how to protect your safety. We consider materials to be of concern for inhalation hazards to have a vapor pressure more than 40 mm Hg. It is also at this point that we can increase the amount of risk a chemical present. Chemicals with a vapor pressure more than 40 mm Hg have greater potential to move away from the immediate site of the event, can be flammable, or can require increased isolation and evacuation distances. A chemical that has a vapor pressure of less than 40 mm Hg usually can only create

harm through touch or ingestion. They may be extremely toxic or corrosive, but the mechanism of harm is through touch or ingestion.

When you see vapor pressures expressed in atmospheres that material can travel for miles. Chlorine as an example can travel for 23 miles and wreak havoc all along the way. Anyone caught in that vapor cloud is most likely going to be seriously impacted, in other words be killed. While an incident that involves sulfuric acid only requires a very small isolation distance as it will not have any downwind effects. The edge of the isolation zone could be 10 feet away from the edge of the spill. You don't need any written information about a spill, if you are walking towards a tractor trailer

with your instruments and your pH paper turns red when you are 100 feet (33 m) away you have a high vapor pressure acid leaking, and it is most likely hydrochloric acid. If you have another scenario and you have to walk up to the back of the truck and you sample the liquid coming from the trailer and the liquid turns the pH paper red it is a low vapor pressure acid, most likely sulfuric. Think about another scenario as you walk towards the truck your LEL sensor indicates 8%. This means there is a high vapor pressure flammable liquid leaking or a flammable gas cylinder leaking. The further away your instrument shows a flammable reading the higher the vapor pressure of the material.

There is much more we could discuss about vapor pressure and a risk-based response but hopefully you have a better appreciation of vapor pressure. It really is the key to understanding your risk at an incident. If we were playing a game and you were only giving me one clue, I would want the vapor pressure of the material. With my instruments I can figure out the risk category. Once I have that information I can dress appropriately, isolate effectively, and determine the severity of the incident. At a real incident I can gather this information in less than 5 minutes and be working to resolve the incident. How long does it take you to get set up and figure things out?

Chris Hawley has 34 years of firefighting experience, from small municipalities to large metropolitan areas.

29 years of experience in hazardous materials and weapons of mass destruction (WMD) response

Has provided training and consulting throughout the United States. Through the Defense Threat Reduction Agency (DTRA) International counterproliferation Program (ICP) which is a partnership with the FBI and CBP has lead training and exercises in almost 40 countries worldwide.

Conference Chair of the IAFC Hazardous Materials Response Teams conference for more than 20 years. This conference is the largest hazardous response conference worldwide.

Serves on the National Fire Protection Association (NFPA) Hazardous Materials Committee for NFPA 472, 1072 and 475. These are international standards for hazardous materials response and training.

Author of more than 9 textbooks, primarily focused on hazardous materials/WMD and Special Operations. Contributed to and co-authored several other textbooks in the same field. Co-Author of Incident Management for IT Operations. Author of numerous magazine and web based articles.

Serves as a subject matter expert on hazardous materials/WMD response and planning concerns.

CONFERENCE DATES



Florida HazMat Symposium
Jan 16th – 19th 2024

Massachusetts HazMat
MAHMT
Mar 26th – 28th 2024

Ontario Hazardous Materials
Responders Association
Apr 8th -10th 2024

Michigan HazMat Responders
Conference
Apr 15th – 17 2024