

HAZARDOUS MATERIALS
AWARENESS LEVEL
FRA 2023



FRA COURSE CONTENT

- FRA Responsibilities and Operations
- Hazmat Recognition Clues
- Hazardous Materials Identification
- Chemical Properties and Behavior
- Hazmat PPE
- Safety Identification and Notification
- The 2020 Emergency Response Guide

- *Why???*



Why should we be aware of hazardous materials? Because if we are not aware of the dangers we will get injured, simple as that!



SECTION ONE

INTRODUCTION TO HAZMAT AWARENESS

This section will cover the reasons we should all be aware of the dangers of hazardous materials we might encounter in our jobs.

MAIN COURSE OBJECTIVE

- At the end of this class, the First Responder Awareness (FRA) level personnel will be able to:
- Safely identify, isolate and make necessary notifications for an incident involving hazardous materials, and...
- Utilize the 2020 ERG and app
- And your IRPG.



AND use your IRPG – the yellow pages, 36-38

Be sure to download the PDF version or the mobile app for either your iPhone or Android phone from the DOT here:

<https://www.phmsa.dot.gov/hazmat/erg/erg2020-mobileapp>

THE HAZMAT PROBLEM

- Use/misuse of Hazardous Materials create “Events”
 - Modern standard of living requires hazardous materials use and transport
 - “Events” will happen
 - Are you ever going to see this placard?.



OK – you’re NEVER going to see a hazardous materials placard like this: *if it’s go*

WHO'S SAFETY IS PRIORITY NUMBER ONE?



You better all say “ME” ! YOU are responsible for your own safety!

Take a look at these pictures = UPS, DHL and FedEx accidents with shipped packages everywhere. Why are these to be considered a possible hazmat? Because ANYTHING can be shipped in these carriers!

The best rule is : *treat it as a potential hazmat until you can prove otherwise!*

THE PROBLEM WITH HAZARDOUS MATERIALS...

- *We just don't think of them as "hazardous"*
- *But they are everywhere...*



Not just the industrial amounts – think of all the household hazardous materials we can come across during a 911 call...

We **MUST** be aware of all the chemicals and products that can be found in house holds, garages, on the roadway, in cars and even as trash in the forest.

They might not be as big as an industrial incident – but they can be just as deadly to us!

The question is – WHERE MIGHT WE BE EXPOSED TO HAZARDOUS MATERIALS?

WHAT IS A HAZARDOUS MATERIAL?

“A hazardous material is a solid, liquid or gaseous substance that, when released from its container, is capable of harming people, the environment and property. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents. ”



REMEMBER – the key part here is “when released from its container”!

It’s OK as long as it is in the container that is designed for it, and it is not under stress (more of this later).

HAZARDOUS MATERIALS IN A WILDLAND FIRE?

- A female wild land firefighter was involved in fighting the STATION wild fire in California on September 1, 2009. During the cleanup phase of the fire she was over an area of a hidden defunct mining operation. While extinguishing the residual flames of a tree trunk, the roots collapsed into a hole and a strange blue flame emanated.
- She backed away and retreated from the site. Minutes later she suffered symptoms of tremors, nausea, and dyspnea. She had what was described as a respiratory arrest and was resuscitated. She was taken to a local emergency department where she was hospitalized for two weeks.
- A Sheriff's hazardous materials team investigated the incident *three days* after exposure that documented an airborne cyanide concentration of 45 ppm near the area in which she was working. An airborne level of 50 ppm of cyanide is immediately dangerous to life and health (i.e. deadly).

This firefighter was doing her job – exactly as she was trained. However, she encountered a deadly amount of cyanide and is now permanently disabled.

Could it happen to you? Do we have “defunct” mining operations in the area of the National Forests? Of course we do...

HAZARDOUS MATERIALS IN A STRUCTURE FIRE?

- Smoke that is present during a structure fire is composed of several irritating, toxic and asphyxiant chemicals, depending on the materials that are burning.
- These chemicals may include hydrochloric acid, ammonia, carbon dioxide, carbon monoxide, hydrogen sulfide and hydrogen cyanide.
- According to the U.S. Fire Administration (USFA), smoke is the killer in 60% to 80% of all fire deaths. Recent research has revealed that hydrogen cyanide present in smoke generated at building fires may play a more significant role in injuries and deaths of firefighters and civilians than once thought.

Remember, we really don't know what is burning in that house, or that garage, or garden shed. Be AWARE!

HAZARDOUS MATERIALS IN A MEDICAL AID?

- **Some of the household products that contain hazardous chemicals are oven cleaners, tile cleaners, toilet-bowl cleaners, liquid drain openers, antifreeze, chrome-wheel cleaners, rust removers, gasoline, motor oil, lead paint, turpentine, lacquer thinner, and muriatic acid..**
- **Any of these may have been the cause of that medical aid you are sent-to**
- **This puts you at a high risk for injury.**

How many of these do you have in YOUR house?

HAZMAT VS. "HAZMINI"

- Hazardous materials are everywhere, and when they get out of their containers we have a problem
- The "huge" hazmat's happen only rarely
- The "hazminis" happen all the time
- We have to be able to recognize the problem, *before we become another part of the problem.*



THE HAZMINI PROBLEM

- We are surrounded by small amounts of dangerous chemicals
- They are literally everywhere:
 - Every home
 - Every garage
 - Every automobile
 - Every commercial structure
- **Every medical aid, every MVA, every structure fire and even wildland fires have the potential to include small amounts of deadly hazardous materials.**



Even though they are small amounts – they are still hazardous to us – especially if they are involved in a fire.

THE HAZMINI PROBLEM

- How can we keep ourselves safe?
- *Awareness...*
- *FRA.*



January 2, 2017:

The Amarillo Fire Department said there were 10 people inside the home when the incident occurred. When crews arrived at the scene just after 5 a.m. Monday, one minor died on scene. The other three died after being taken to the hospital. The oldest of those who have died due to this incident was 17 years old. One of the other people who were taken to the hospital is said to be unstable and in critical condition.

AFD said someone at the residence had placed a pesticide, which is now identified as Weevil-Cide, containing aluminum phosphide (UN #1397, Guide Number 139) underneath the house. At some point, a person living at the home tried to wash away the pesticide with water. This caused a chemical reaction that created phosphine gas, which is extremely dangerous. Phosphine gas causes pulmonary edema and extreme respiratory distress. (IDLH 50 ppm)

The only way to keep ourselves safe is to be aware of what is out there and how it can hurt us.

This is where FRA – First Responder Awareness training comes in.



SECTION TWO

HAZARDOUS MATERIALS RESPONSE LEVELS

This section covers the various levels of hazardous materials response.

OSHA RESPONSE LEVELS

- **First Responder Awareness (FRA)**
- **First Responder Operations (FRO)**
- **Hazardous Materials Technician (Tech)**
- **Hazardous Materials Specialist (Spec)**
- **Hazardous Materials Incident Command (IC).**

The difference between these levels in education hours: FRA about 2-4 hours, FRO 16 hours, Technician is four weeks of class, Specialist is Technician level plus two more weeks.

FIRST RESPONDER AWARENESS LEVEL

❖ OSHA FRA definition:

- Likely to witness/discover a release
- Can initiate notifying authorities
- Should be able to utilize the Emergency Response Guide
- Can take steps to isolate / deny entry
- Emergency decontamination of patients- when safe to do so
- Take no further actions.

FRA does not “respond” to a hazardous materials incident, but will more than likely find one. At this level you will be able to recognize a hazmat incident and take the necessary steps to protect people from the material.

At this level you do not take any steps to contain or stop the release of the material.

FIRST RESPONDER OPERATIONS

- **OSHA FRO Definition:**
 - **One who responds to HazMat release**
 - **As part of the initial response**
 - **In a defensive fashion**
 - **Doesn't try to actually stop the release**
 - **Contains release from a safe distance.**



FRO will defensively contain the release from a safe distance. The key here is “safe”: This level does not have any specialized protective equipment or materials to stop the release, but has to work with what is present.

TECHNICIANS / SPECIALISTS

- **Tech/Spec OSHA Definition:**
 - **One who responds to HazMat release**
 - **Enters the Hot Zone**
 - **Actively stops the release.**



Technicians and Specialists (when fully equipped) enter the Hot Zone and stop the release; if this level has no specialized equipment (such as the level A hazmat suits shown in the picture) then they are responding at the FRO level only.

HAZMAT & “WHO’S IN CHARGE”

- **In County areas:**
 - **On-highways – IC is CHP Deputy**
 - **Off-highways – IC is County Sheriff Deputy.**

In this County it is the CHP or the Sherriff Deputy – and they don’t want it. Of course, you may be on scene before one of these agencies, so what do you do?

HAZMAT & “WHO’S IN CHARGE”

- The first FRA on-scene can help by:
 - Assume Temporary Command formally
 - Setup Temporary Command Post...
 - Manage event until a designated IC arrives
 - Focus on: safety, isolation, notification.

Focus on the safety of yourself, others in your crew, and the public (in that order), on isolating the incident (per the directions you will find in the Emergency Response Guide and your IRPG) and notification of the next levels of response (such as CHP and County Sheriff, and CAL FIRE).

SO...IN COUNTY AREAS

- County Sheriff Officer will be dispatched as the IC
- Cal Fire will be dispatched as FRO level response
- If needed, specialized Haz Mat Teams will be dispatched from Merced/Madera County
- Where do we fit-in???
 - *First on-scene, first to recognize a hazardous materials incident.*

First on-scene has the responsibility to recognize a hazardous materials incident. **This is the main purpose of this course – we can't deal with something we don't recognize!**

RECOGNIZING A HAZMAT INCIDENT:

- A hazardous material may be “found” during a fire, MVA or medical aid;
 - Initial report may not indicate presence of hazardous materials!
- We **MUST** be able to recognize a hazardous material
 - Why?.

- Why do we need to recognize a hazardous material?
- How many ways can hazardous materials kill you????

6 WAYS HAZARDOUS MATERIALS CAN KILL

- ▶ Toxicity
- ▶ Radioactivity
- ▶ Asphyxiation
- ▶ Explosion
- ▶ Flammability
- ▶ Corrosives.

HWIKMF?



You don't want to be at the receiving end of any of these. The only way we can keep ourselves safe is by recognizing a hazmat before we go stomping through it.

HWIKMF – means How Will It Kill Me First? We need to be aware of these dangers!

And to find that we need recognition clues!




SECTION THREE

HAZARDOUS MATERIALS RECOGNITION CLUES

This section covers the clues we should be searching for – these clues will give us the heads-up on a suspected hazardous materials release so we can deal with them in a safe manner

HAZMAT RECOGNITION CLUES

- Occupancy/Location
- Container Shapes
- Markings & Colors
- Placards & Labels
- Shipping Papers, MSDS
- Senses (?)
- Other Clues.



Looking at this picture – would you rush in? NO! Whatever made this per

Occupancy/Location (Plating shop or highway).

Container Shapes (55-Gallon drum or ribbed tanker).

Markings & Colors (Package/label markings or colors).

Placards & Labels (Orange placard = Explosive).

Shipping Papers and MSDS (Consist for railroad incident).

- Senses (Sight, hearing and smell - last resort PLEASE!).
- Other Clues (Responsible party, witness, business plan, etc).

HAZMAT RECOGNITION CLUES

- Occupancy?
- How about hazardous materials here?



The auto parts store is pretty obvious – it is loaded with potentially hazardous materials.

HAZMAT RECOGNITION CLUES



- And don't forget: Hazardous materials here?



BUT how about a grocery store? What might it have that is potentially hazardous? (Think pesticides, cleaners etc)

And the drug store as well – what is in there that could cause harm?

RECOGNIZING A HAZMAT INCIDENT:

The types of reported injuries may be a clue:

- Presence of multiple patients with the same signs and symptoms,
- Two or more people “down” in an area.



Several people have sudden onset of difficulty breathing? Do YOU want to be the next one?

THINK before you enter!

RECOGNIZING A HAZMAT INCIDENT:

- **Dead animals, birds, fish and insects around the area.**



What killed the animals – could it kill YOU too???

RECOGNIZING A HAZMAT INCIDENT:

- **Areas of dead vegetation at the scene.**



Again – what killed the plants?

RECOGNIZING A HAZMAT INCIDENT:

- **Low-lying fog- like clouds.**



At around 4:25 a.m. on April 25, 2019, a large release of anhydrous ammonia occurred on Green Bay Road at Clarendon St. in Beach Park, Illinois. The Lake County Sheriff's Office and 39 fire departments responded to the incident. Officials advised residents within a one-mile radius to shelter in place.

The ammonia gas affected residents and people traveling through the area. Emergency crews conducted door-to-door wellness checks, evaluating and treating residents as needed. Approximately 40 people were transported via ambulance to local hospitals. The Sheriff's Office lifted the shelter in place order at 10:00 a.m.

RECOGNIZING A HAZMAT INCIDENT:

- Placards, NFPA 704, other warning signs.



More on these later. Just remember – if it has a placard it is hazardous!

RECOGNIZING A HAZMAT INCIDENT:

- Evidence of fumigation.



Why would this be dangerous? Whatever is killing the spiders can certainly kill you!

RECOGNIZING A HAZMAT INCIDENT:

- ▶ Evidence of leak, fire, smoke, visible vapors, unusual colors/odors.



This is an actual picture of a release of red fuming nitric acid. Notice the water streams trying to contain some of the gasses by making them soluble with the water – it is easier to contain a pool of liquid than it is to contain a gas cloud.

Try not to be the one who reports an unusual odor – if you breathe it in you are contaminated.

RECOGNIZING A HAZMAT INCIDENT:

▶ Evidence of sheen on the water.



What might this spill be? Some sort of hydrocarbon like oil.

RECOGNIZING A HAZMAT INCIDENT:

- People running from, or collapsed in the area.



You want to find out what is happening before you go running in to that scene!

SOUND OF AN OPERATING RELIEF VALVE VIDEO

- Pause here and take a look at the video on the sound of propane tanks during a structure fire on the Hazmat Training page.



RECOGNIZING A HAZMAT INCIDENT:

- Responders may sense unexplained odors or irritation (let's try not to be close enough for this one)
- Or something just doesn't look right...
- Remember: *Assume HazMat & look for clues or warning signs until you confirm the absence of hazardous materials.*



Trust your gut feelings on this – if something just doesn't seem right it usually isn't

This happens to be a spill of Sunny Delight concentrate into a waterway.

RECOGNIZING A HAZMAT INCIDENT:

- Container shapes:
- WWWTP?



What's Wrong With This Picture? Whatever was in these containers wanted out – in a big way. Remember the definition of a hazardous material? This stuff is no long in it's container!

CONTAINERS AND PACKAGES

- **Shape may be a clue to the contents:**
 - **Container shape**
 - **Package shape**
 - **Truck**
 - **Tank.**



Look at this picture – if this truck was leaking we could determine a safe stand off distance from the ERG just by the shape. More on this later.

PRESSURIZED GAS CYLINDERS

- **Oxygen**
- **Acetylene**
- **Nitrogen**
- **Propane, etc.**
- **NEVER use cylinder color to determine contents!**



These cylinders happen to contain CO₂ – but do not assume that all black cylinders contain CO₂.

CONTAINER SHAPES - CRYOGENIC



A refrigerated, liquefied gas that has a boiling point colder than -90°C (-130°F) at atmospheric pressure.



This photo is from the parking lot of JCF Hospital – liquefied oxygen in cryogenic containers can be seen.

What is the danger to responders with cryogenics?

OTHER FIXED FACILITY STORAGE TANKS

PROPANE



We have lots of these in our mountain counties – remember – a propane incident is still a hazmat

How about transportation incidents ---- let's take a look at a scenario...see if you can spot the clues...

TRANSPORTATION INCIDENTS

First On-scene, and you see this:



So – you are first on scene of an accident involving a big-rig tank truck. What are you going to do?

Number One – you keep yourself safe by recognizing the clues that shout “HAZMAT!” – the red placard and shape of the tank are big clues!

Number Two – you keep yourself safe by staying away from it. You may be in great danger by splashing through this incident.

Number Three - you must identify it. But how can you when you can't get close?

We can use the shape of the truck trailer for one, and the placard for another.... **Let's take the tank shape first.**

DOT SPEC VEHICLES (PAGE 12/13 ERG)

- DOT/TC 406:
- Carries gasoline or other flammable and combustible materials
- Oval-shaped tank
- MAWP – max allowable working pressure 3-15 psi.



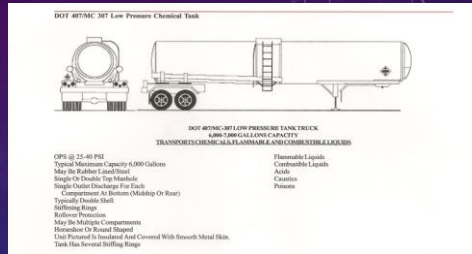
Look at pages 12-13 in your 2020 ERG – all the silhouettes are shown here, with the Guide Number that you can reference in a black circle.

Why? Because if you are approaching a scene and can only see the general shape of the truck trailer then you can still get a Guide Number and that gives you a safe isolation distance.

So for our incident you recognize that this is a DOT 406 with a Guide Number of 131

DOT SPEC VEHICLES

- DOT/TC 407:
- Round or horseshoe shaped tank
- Carries 6000 to 7000 gal (MAWP >25 PSI)
- Flammable liquids, mild corrosives, and poisons.



Take a look at the other types of tank trucks that are shown in the ERG:

This is a DOT 407 - Greater psi allowable here, with a smaller diameter for heavier liquids and strengthening rings for greater pressure. It might be insulated and covered with a skin that makes its silhouette a horseshoe shape.

DOT SPEC VEHICLES

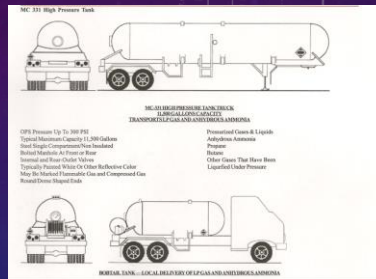
- DOT/TC 412:
- For corrosive substances
- Round - Smaller diameter
- Reinforcing rings
- MAWP > 15 psi
- Holds 6000 gal.



The DOT 412 is for even heavier liquids with rings for added strength and a smaller round cross-section. You might see this type of tanker carrying water (yes, just plain old drinking water) because water is heavy – 8.34 lbs. per gallon (6000 gallons would weight over 50 thousand pounds!)

DOT SPEC VEHICLES

- MC/TC 331:
- Carries materials like ammonia, propane, and butane
- Rounded ends
- MAWP 100-500 psi
- Significant explosion hazard.



We see lots of these on the road – “bobtail” trailers carrying propane. Significant explosion hazards with release and fire.

DOT SPEC VEHICLES

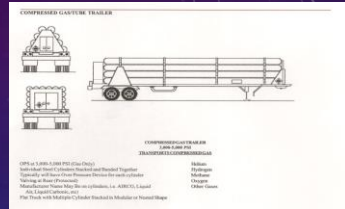
- MC/TC 338:
- Cryogenic liquid tank
- Tank insulation
- Boxlike structure at end
- MAWP 25-500 psi
- Contents can be at -400°F .



Liquid Oxygen @ -297 degrees, liquid hydrogen at -423 degrees. Would this be a hazard to your?

DOT SPEC VEHICLES

- **Tube Trailer:**
- Carry compressed gases
- Several individual cylinders banded together and affixed to a trailer
- Large-volume cylinders operate at 3000 psi to 5000 psi.



Very high pressure in these tubes.

DOT SPEC VEHICLES

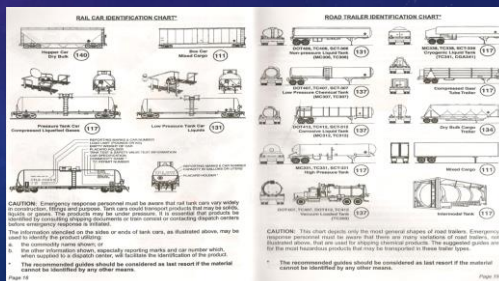
- Dry Bulk Cargo:
- Powders, pellets, fertilizers, or grain
- Not pressurized
- May use pressure to off-load product
- Generally V-shaped with rounded sides.



We see these carrying dry bulk cargo such as livestock feed, grains and fertilizer.

DOT SPEC VEHICLES

- Where do you find this information?
- Remember the ERG!
- ... page 10-11 for railcars
- ...page 12-13 for road trailers.



The ERG is where you go FIRST! THEN go to the Guide Number...

TRANSPORTATION INCIDENTS

Back to our incident:



So - We can use the shape of the truck trailer – what is this tank and what Guide Number would you use? Oval shape - DOT 406, Guide Number 131

What does Guide Number 131 tell us?

It may be carrying Flammable Liquids – Toxic, just that alone makes you want to stay far, far away. More on using the rest of the information on these two Guide pages later in this course.

OTHER WARNING SIGNS: SPECIAL MARKINGS

- Biohazard sign
- Military markings
- Pipeline markers
- Placards and labels
- NFPA 704
- *We need to identify this stuff.*



Let's take a look at these in the next section...



This section covers how we can identify the materials before they cause injury

MILITARY MARKINGS



These are not going to be found without an escort of military personnel. And that's a good thing.

Look at your IRPG page 37: U.S. Army Operations Center for incidents involving explosives and ammunition: **(703) 697-0218**

The United States military tries to use markings such as the Department of Transportation (DOT) placards, labels, and NFPA 704 as much as possible both while materials are in transportation and once stored at a fixed facility.

However, there are times when a special marking system developed by the military must be used. The primary reason for this is that the military marking system is not language dependent

The military uses the marking systems within facilities when working around ammunition such as rockets, missiles, and other devices.

First Row (Fire and Explosion Hazards):

Octagon = DOT 1.1 Material

X = DOT 1.2 Material

Inverted Triangle = DOT 1.3 Material

Diamond = DOT 1.4 Material

Second Row (Chemical Agents)

G = Nerve Agent

VX = VX Nerve Agent

H = Blister Agent

Special Hazard: Use No Water (Water Reactive)

Third Row (Protective Equipment)

Wear Breathing Protection

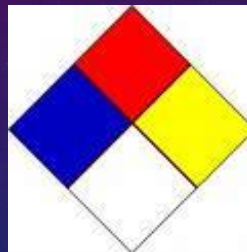
Protective Clothing Set 1 (Red) for Highly Toxic Chemical Agents

Protective Clothing Set 2 (Yellow) for Harassing agents

Protective Clothing Set 3 (Silver/white) for Spontaneously Combustible

THE NFPA 704 SYSTEM

- Numbered 0 to 4
- Is designed for buildings
- Red, Yellow, Blue and White sections
- RED: Flammability
- YELLOW: Reactivity
- BLUE: Health Hazard
- WHITE: Special Information.



We will see these – the NFPA 704 system designed for fixed facilities. It doesn't give specific information on what is in there, just the main hazards

Red is for flammability

Yellow is for reactivity – if it will readily explode

Blue is for health hazards

White is for special information - Special information in the white quadrant includes corrosives, oxidizers and don't put water on it.

Again, look at your IRPG – page 38

THE NFPA 704 SYSTEM

IRPG Page 38

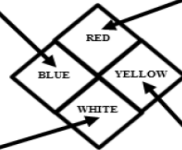
HazMat Classification for Fixed Facilities Based on NFPA 704

HEALTH HAZARD

- 4 Deadly
- 3 Extreme Danger
- 2 Hazardous
- 1 Slightly Hazardous
- 0 Normal Material

FIRE HAZARD

- 4 Below 73°F
- 3 Below 100°F
- 2 Above 100°F not exceeding 200°F
- 1 Above 200°F
- 0 Will not burn



SPECIFIC HAZARD

- ACID – Acid
- ALK – Alkali
- COR – Corrosive
- OX – Oxidizer
- ☢ – Radioactive
- W – Use no water
- SA – Simple asphyxiant
- POI – Poisonous

REACTIVITY

- 4 May detonate
- 3 Shock and heat may detonate
- 2 Violent chemical change
- 1 Unstable if heated
- 0 Stable

IRPG – All Hazard Response

38

IRPG page 38 lists the various levels of hazards – anything with a “4” in it is bad for responders!

DOT PLACARDS AND LABELS

- 9 Hazard classes/with associated placards;
 - Colors
 - Symbols
 - Class Numbers
- See list on page 6 your 2020 ERG
- See placards on pages 8-9.



What is this material that has this placard associated with it? Who knows ? **But you can still identify it as Class 2 gas, that is toxic (the skull and cross bones are a good clue here)**

The nine hazard classes are shown by placards of different colors symbols and class numbers. On page 6 in your ERG you will find a list of all the hazard classes and subclasses, on pages 8-9 are all the placards with the associated Guide Numbers.

Why do we need this? Because if all you can see (from a safe distance) is a placard you can still get an idea of the isolation distances.

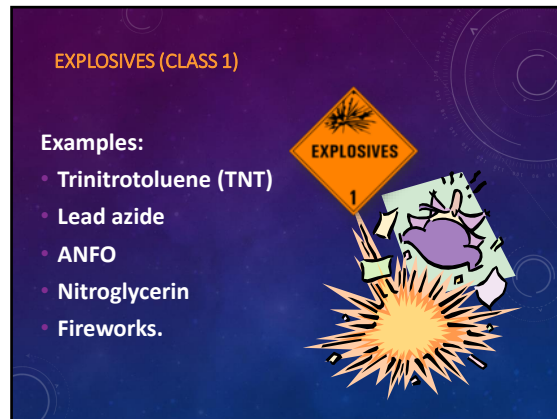
THE NINE HAZARD CLASSES

- Class 1 – Explosives
- Class 2 – Gases
- Class 3 – Flammable Liquids
- Class 4 – Flammable Solids
- Class 5 – Oxidizers and Organic Peroxides
- Class 6 – Toxic/Poison
- Class 7 – Radioactive
- Class 8 – Corrosives
- Class 9 – Miscellaneous Hazardous Materials.



Remember – classes and divisions listed on page 6 in your ERG. You don't have to memorize these because you will always have an ERG to reference – RIGHT?

Let's take a look at each class -




ANFO = Ammonium Nitrate Fuel Oil, consists of prilled ammonium nitrate
Trinitrotoluene is called TNT
Lead azide is NOT in the ERG – it is not considered safe enough to transport
And yes, fireworks will be placarded when transported

GASES (CLASS 2)

Examples:

- Anhydrous Ammonia
- Acetylene
- Nitrogen
- Propane
- Oxygen.




Gasses can be three different colors – Class 2 has divisions of flammable (red), nonflammable (green) and toxic (white). Does the green placard mean there is no danger? NO – still a gas under pressure.

FLAMMABLE/COMBUSTIBLE LIQUIDS (CLASS 3)

Examples:

- Alcoholic Beverages
- Hydrazine
- Toluene
- Acetone
- Gasoline/Diesel
- Butane.




Yes, alcoholic beverages can be placarded! The main materials we will see will be gasoline and diesel.

FLAMMABLE SOLIDS (CLASS 4)

Examples:

- Aluminum phosphide
- Naphthalene
- Sodium metal
- Calcium Carbide
- Fusees.




The image displays three hazard labels for Class 4 Flammable Solids. The top label is a diamond-shaped placard with a red and white vertical striped background, a black flame icon, and the text 'FLAMMABLE SOLID' and the number '4'. The bottom-left label is a white diamond with a black flame icon, the text 'HIGHLY COMBUSTIBLE', and the number '4'. The bottom-right label is a blue diamond with a white flame icon, the text 'DANGEROUS', and the number '4'.

Your fusees will be in a box with the red and white striped placard label – they are a flammable solid.

OXIDIZERS & ORGANIC PEROXIDES (CLASS 5)

Examples:

- Red Fuming Nitric Acid
- Potassium nitrate
- Oxygen
- Organic Peroxide (MEKP)
- Chlorine.



Remember the fire triangle – fuel, heat and oxygen. With any oxidizer, you do not need another source of oxygen – that’s why they are considered highly dangerous for fire situations – they add oxygen to the fire.

POISONOUS & INFECTIOUS MATERIALS (CLASS 6)

Examples:

- Hydrazine
- Nicotine
- Fluorine
- Bromine
- Ammonia
- Insecticides.



Yes, nicotine is considered poisonous.....

RADIOACTIVE MATERIALS (CLASS 7)

Examples:

- Uranium Hexafluoride
- Cesium
- Uranium oxide
- Thorium.




This one is pretty well –known. There are various classes of radioactivity, take a look at the various placards on page 9 in your ERG.

CORROSIVE MATERIALS (CLASS 8)

Examples:

- Red Fuming Nitric Acid
- Hydrazine
- Hydrochloric acid
- Sodium hydroxide
- Sulfuric Acid
- Hydrofluoric acid.

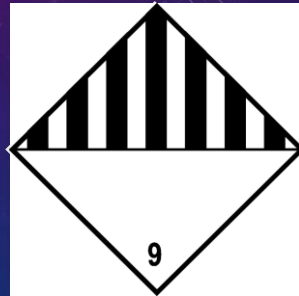


Corrosives include both bases and acids – at either end of the pH scale, defined as: A **corrosive substance** is one that will destroy and damage other substances with which it comes into contact” hence the pictogram showing a test tube spilling a liquid on a human hand and a bar of metal (and dissolving both of them) – NOT something you want to come in contact with!

MISC. HAZARDOUS MATERIALS (CLASS 9)

Examples:

- Wheelchairs
- Automobiles
- Asbestos
- Firefighting Foam suppressant
- Hazardous waste.



The miscellaneous hazardous material is a material that presents a hazard during transportation but which does not meet the definition of any other hazard class.

This class includes:

Any material which has an anesthetic, noxious or other similar property which could cause extreme annoyance or discomfort so as to prevent the correct performance of assigned duties; or

Any material that meets the definition in 49 CFR 171.8 for an elevated temperature material, a hazardous substance, a hazardous waste, or a marine pollutant. And yes, your firefighting foam suppressant would have this placard.

PLACARDS AND LABELS

- Remember: Placards on pages 8-9 of ERG
- Know the placard limits:
 - Multiple and subsidiary hazards
 - “Dangerous” placard:
 - Used when two or more different categories are shipped together
 - *Used for mixed loads of over 1001 lbs.*





The Dangerous placard is for mixed loads – anything could be in there!

GLOBALY HARMONIZED SYSTEM

- International system for classifying, marking and communicating hazards
- ERG pages 16-17.

1 Sulfuric Acid

2  **3** Danger! May be harmful if swallowed. Causes severe skin burns and eye damage. Fatal if inhaled. Harmful to aquatic life.

4  Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.










5 **IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

In case of fire Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

See Material Safety Data Sheet for further details regarding safe use of this product.

6 Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA Telephone: +18003255632

1 Product Identifier	4 Hazard Statements
2 Pictograms	5 Precautionary Statements
3 Signal word, "Danger!"	6 Supplier Information

GHS Pictograms and Hazard Classes		
<p>pic 1803</p>  <p>Oxidizers</p>	<p>pic 1802</p>  <p>Flammables Self Reactives Pyrophorics Self-Heating Emitting Flammable Gas Organic Peroxides</p>	<p>pic 1801</p>  <p>Explosives Self Reactives Organic Peroxides</p>
<p>pic 1809</p>  <p>Acute Toxicity (severe)</p>	<p>pic 1808</p>  <p>Corrosives</p>	<p>pic 1804</p>  <p>Gases Under Pressure</p>
<p>pic 1807</p>  <p>Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Toxicity</p>	<p>pic 1806</p>  <p>Environmental Toxicity</p>	<p>pic 1805</p>  <p>Irritant Dermal Sensitizer Acute Toxicity (harmful) Narcotic Effects Respiratory Tract Irritation</p>

The **Globally Harmonized System of Classification and Labelling of Chemicals (GHS)** is an internationally agreed-upon standard managed by the [United Nations](#) that was set up to replace the assortment of hazardous material classification and labelling schemes previously used around the world. Core elements of the GHS include standardized hazard testing criteria, universal warning pictograms, and harmonized safety data sheets which provide users of dangerous goods with a host of information.

The system acts as a complement to the [UN Numbered](#) system of regulated hazmat transport. Implementation is managed through the [UN Secretariat](#).

Although adoption has taken time, as of 2017, the system has been enacted to significant extent in most major countries of the world.



In a Truck: Bill of Lading (In cab near driver seat or with driver);

In an Airplane: Air Bill (With pilot, usually in cockpit);

In a Rail car: Waybill and Consist (With crew, usually conductor);

On a Marine Vessel: Dangerous Cargo Manifest (On bridge. For barges – in

MATERIAL SAFETY DATA SHEETS

- Should be available for each product in the workplace
 - Required by OSHA Hazard Communication Regulations
- Provides valuable information:
 - Chemical/physical properties
 - Toxicity
 - Flammability
 - Why do we need to know this?.

BOC GASES
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: PROPANE

1. Chemical Product and Company Identification

BOC Gases
Division of
The BOC Group, Inc.
470 Mountain Avenue
Morristown, TN 37814

BOC Gases
Division of
BOC Canada Limited
8775 Fallis Drive, Unit 2
Mississauga, Ontario L5R 9W4

TELEPHONE NUMBER: (800) 464-6300
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTRAC: (800) 424-9300

TELEPHONE NUMBER: (905) 561-1200
24-HOUR EMERGENCY TELEPHONE NUMBER:
EMERGENCY RESPONSE PLAN NO. 2030

PRODUCT NAME: PROPANE
CHEMICAL NAME: Propane
COMMON NAMES/SYNONYMS: L.P.G. (Liquefied Petroleum Gas)
TRADE NAME: BOC PROPANE
WEIGHT CLASSIFICATION: A, B1, D2B

PREPARED BY: Low Control (09/004-0100/005/001-170)
PREPARED DATE: 05/92
REVIEW DATE: 07/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	FL. CLAS ¹	FL. ASSESS ²	Exp. or Vol. Characteristics
Propane	99.1 to 99.9	ODD ppm	Severe Irritant	Not Available
PROPANE, C ₃ H ₈				
LOW PRESSURE				
UNION B. REFERENCE				

1. As defined in 29 CFR 1910.1203. 2. Threshold Limit Values for Chemical Substances and Physical Agents.

3. Hazards Identification

EMERGENCY OVERVIEW
This product does not contain oxygen and may become inert if released in a confined area. Simple hydrocarbons can cause irritative and central nervous system depression at high concentrations. Extremely flammable.

ROUTE OF ENTRY:

Route of Entry	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

MSDS: 0134
Revised: 07/96

Page 1 of 6

The MSDS will have the following information:

Chemical name.

Company identification.

Hazard identification.

Response information.

- Chemical/physical properties, etc.
- But – WHY do we need to know this information?



SECTION FIVE

CHEMICAL PROPERTIES – HOW WILL IT KILL ME FIRST?

This section covers how we can identify the materials worst-case scenario – and keep ourselves safe

SAFETY TACTICS

- We need to know more information about the hazardous material:
- Will it burn or explode?
- Is it an inhalation hazard?
- Is it radioactive?
- What other properties or characteristics will tell us *how it will kill me first?*

We can't just go rushing into a hazmat incident. We need as much information about the substance as we can get.

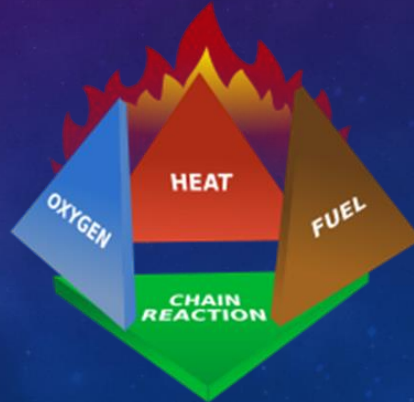
WE NEED MORE INFORMATION

- **The physical properties will tell us where to position ourselves for safety and what to watch out for during this incident:**
 - Boiling point
 - Flash point
 - Specific gravity / vapor density
 - Vapor Pressure
 - pH
 - Radioactivity levels and type.

Why do we need to know these things? How it will hurt or kill me or other responders/public. Where can we get this information? Programs such as WISER are available for free(more on WISER later) The MSDS also lists all pertinent chemical properties.

WE NEED MORE INFORMATION

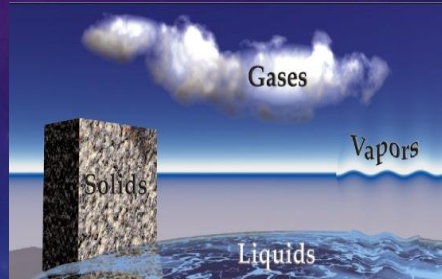
- We need to know if it will burn or explode;
- First, let's have a quick review of the elements of fire.



What are the elements of the fire triangle?. Fuel, oxygen and heat – let's take a look at fuel.

#1: FUEL – WILL IT BURN?

- Fuel is in three physical states:
 - Solid
 - Liquid
 - Vapor/Gas
- Combustion only occurs when fuel is in a gas or vapor state.



Number One – you need some sort of fuel.

REMEMBER; combustion **ONLY** occurs when the fuel is in a gas or vapor state – **NOT** when it is a solid or a liquid (solids and liquids do **NOT** burn!). The fuel must be hot enough to produce gas/vapor or you will not have fire.

But certain materials will vaporize at lower temperatures so we need to know this. Certain properties will let us know when the fuel can burn.

HAZMAT FLAMMABILITY

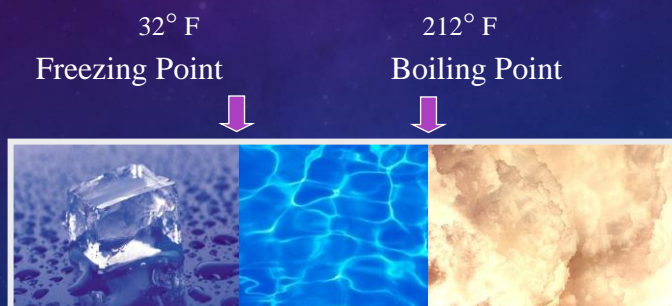
- **What Properties Tell Us If It Will Explode Or Burn?**
- **Boiling Point (BP)**
- **Flash Point (FP)**
- **Flammable Range (FR).**



Let's take a look at each one of these...

BOILING POINT

- Boiling point tells us if it will be a solid, liquid or gas – at a known temperature.

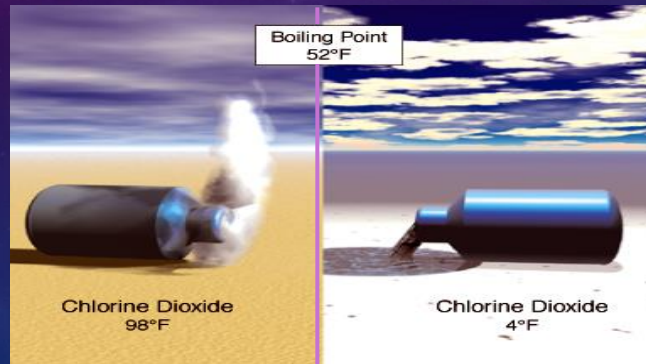


Boiling point tells us when it gives off vapors that might burn

What is this compound that is a solid below 32 degrees F and a gas/vapor above 212 degrees F? Water – dihydrogen oxide.

BOILING POINT

- **Boiling Point (BP):**
 - The temperature a material will begin to vaporize.



So, we need to know when a material will be in its gaseous state and therefore able to be a fuel and burn: in other words when it is above its boiling point.

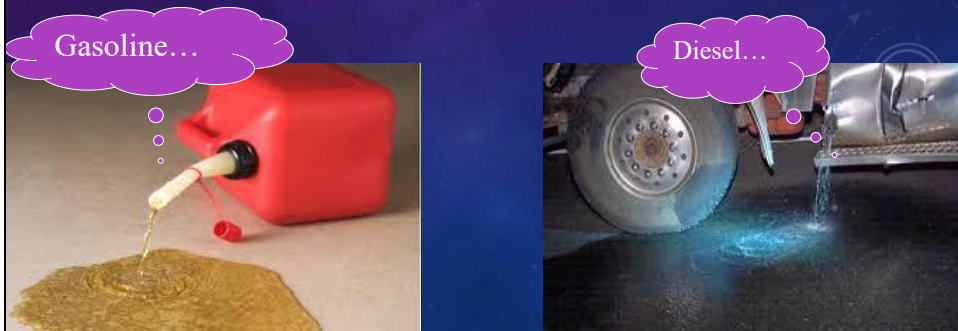
That depends on its temperature. Here we have two containers of chlorine dioxide – UN 9191, Guide Number 143, kinda nasty stuff

If its boiling point is above 52 degrees F – it will be a liquid at 4 degrees F and a vapor at 98 degrees F. **At what temperature will it be able to burn?????**

BOILING POINT; WHY SHOULD WE CARE?

- Diesel spill at ambient 54° F?
 - Boiling Point 360° F
- Gasoline spill at ambient 97° F?
 - Boiling Point 95° F.

WHICH ONE WILL VAPORIZE FIRST?
(will create enough flammable vapors to burn.)



So – why should we care?

Here are two fuel spills – one of diesel in the winter, and one of gasoline in the summer.

Based on the boiling point and the ambient temperature – the gasoline will be much more of a potential problem than the diesel spill, because it will create enough vapors at 95 degrees F to burn – the diesel will not create vapors at 56 degrees F. (In fact you would have to heat up the diesel fuel to burn: [Glow plugs](#), grid heaters and block heaters help achieve high temperatures for combustion of diesel fuel during engine startup in cold weather.)

FLAMMABLE RANGE

- At what concentration - mixed with oxygen - will the material burn?
- If the concentration of the material is within the flammable/explosive range the material could easily burn
- Upper Explosive Limit = UEL:
 - Above this it will not burn (not enough oxygen)
- Lower Explosive Limit = LEL:
 - Below this it will not burn (not enough fuel).



Besides temperature we must take into account the concentration when mixed with air (oxygen). Too rich or too lean it will NOT burn. This is why the gasoline in your car's tank will not explode until breached – not enough oxygen in the intact tank to burn.

The flammable range is different for each material – let's take a look at some ranges:

FLAMMABLE RANGE

The Wider the Range the More Dangerous it is in Terms of Flammability:

<u>Chemical</u>	<u>LEL</u>	<u>UEL</u>
Gasoline	1.7%	7.6%
Acetone	2.6%	12.6%
Ethylene Oxide	3%	100%
Propane	2.1%	9.5%



So – which one is more dangerous to us? Ethylene oxide carries its own oxygen, so it will burn at 100% concentration.

Gasoline has much less of a range; 1.7% up to a concentration of 7.6%.

But look at propane – which we have through this County – 2.1 to 9.5% - that's all , it won't burn below that or above that.. **However, the real problem with propane is its vapor density – we have to know where it will go...**

#2: GAS VAPOR DENSITY – WHERE WILL IT GO?

- **Vapor Density:**
 - Weight of a gas compared to air (air = 1.0)
 - Gas with vapor density less than 1.0 will rise
 - Gas with vapor density greater than 1.0 will settle
 - Knowing vapor density helps predict *where* the danger will be.



Look at the difference between helium (and where it will go) and propane and where IT will go – what is a problem with propane? It will go downhill, it will find an ignition source and flash back to the tank.

This is a problem with flammable gasses as well as those that are hazardous to health. Confined space programs deal with this as a major part of the program – because WE need a certain amount of oxygen to function too.

CONFINED SPACE AND VAPOR DENSITY

- A confined space compounds the problem of vapor density by allowing the gas to accumulate; either pushing out the available oxygen or by becoming toxic
- And remember: most gases are colorless, odorless and tasteless
- We can get in trouble before we know it;
 - Unless we have a high index of suspicion!



Don't become a canary - The classic example is the "[canary](#) in the [coal mine](#)". The idea of placing a [canary](#) or other warm blooded animal in a mine to detect [carbon monoxide](#) was first proposed by [John Scott Haldane](#), in 1913 or later. Well into the 20th century, coal miners brought canaries into coal mines as an early-warning signal for toxic gases, primarily [carbon monoxide](#).

Do we still go into confined spaces without considering the atmosphere? Yes, we do...



SECTION SIX

PERSONAL PROTECTIVE EQUIPMENT – HOW CAN WE PROTECT OURSELVES?

This section covers how we can protect ourselves using PPE (IF we have it...)

PPE – THE RESPONDERS BEST FRIEND

- Four levels of chemical protective equipment used in hazardous materials response.



There are four levels of PPE used to protect ourselves in a hazardous materials incident...

PPE – THE RESPONDERS BEST FRIEND

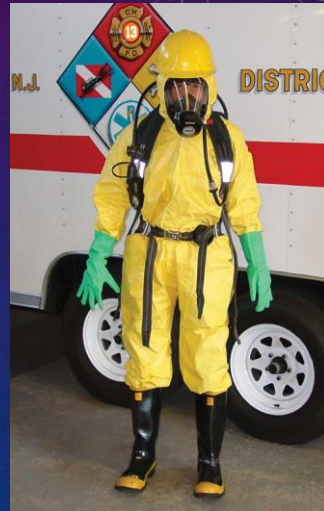
- Level A – vapor/liquid tight (encapsulating)
- SCBA inside suit.



Highest level of protection – only Tech/Spec can use this level as it takes a higher level of skill and training to use

PPE – THE RESPONDERS BEST FRIEND

- Level B – not vapor tight, splash protection only, with high respiratory protection
- SCBA over suit.



This level is only when you KNOW what material you are dealing with because it is splash protection only (but high respiratory protection with the SCBA). It is generally used for technical decontamination.

PPE – THE RESPONDERS BEST FRIEND

- Level C – level B with APR instead of SCBA, splash with minimal respiratory protection
- Air Purifying Respirator (APR) only – with chemical-specific canisters.



Since this level uses the APR (Air Purifying Respirator) which takes chemical-specific cartridges – again, you need to know what material you are dealing with

PPE – THE RESPONDERS BEST FRIEND

- So, what's the fourth level?
- Level D – FULL structure turnouts with SCBA – remember – *it is not certified for chemical contact, and may act like a "sponge"*.



So how safe is this level? Not at all. But it might be all we have.

PPE: NUMBER ONE LIMITATION

- Lack of PPE for hazardous materials:
 - We just don't have any!...



So – if we don't have any proper PPE – then how do we keep ourselves safe????

PPE: NUMBER ONE FRA LIMITATION

- **From the ERG – page 360**
- **Street Clothing and Work Uniforms:**
 - These garments, such as uniforms worn by police and emergency medical services personnel, provide almost no protection from the harmful effects of dangerous goods.

We just cannot go rushing in to these kind of incidents.

NUMBER ONE FRA LIMITATION

- So – how do we protect ourselves?
- By recognizing a hazardous materials release and acting accordingly...



How do we act accordingly – Safety Isolation Notification



SECTION SEVEN

SAFETY – ISOLATION - NOTIFICATION

This section covers how we can protect ourselves by using what we DO have...

IF YOU THINK YOU HAVE A HAZARDOUS MATERIALS SITUATION... THEN YOU DO HAVE A HAZARDOUS MATERIALS SITUATION!

- **So...What Do You Do?.**



So – what can we do to protect ourselves and others?

YOU NEED TO - *SIN*

1. **S = Safety**
2. **I = ID/Isolation**
3. **N = Notifications.**



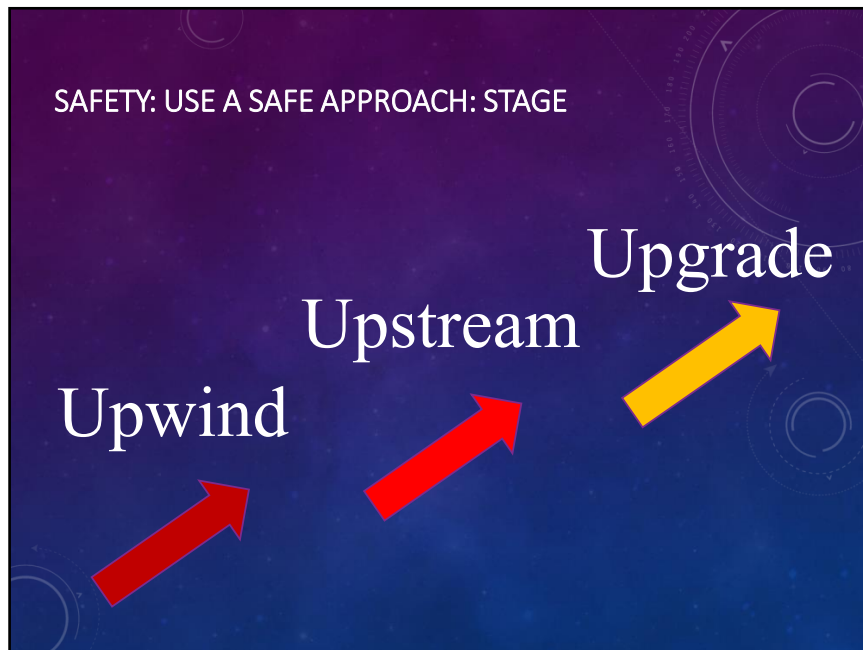
SAFETY – ISOLATION - NOTIFICATION

#1: S = SAFETY!

- **RECOGNIZE** that it **MIGHT** be a Hazardous Materials incident
- **RESIST** rushing in!
- Approach **CAUTIOUSLY** or *not at all*
- *Risk Management is of principal importance in any Hazardous Materials Incident.*



Safety: being able to RECOGNISE that this is a hazardous materials incident is paramount here. Use all the clues you can find to eliminate a hazmat before rushing in to one!



This is the safest place to stage: up in all situations, because...this stuff tends to go down hill and with the wind

SAFETY: IDLH ATMOSPHERE

- **Remember: Inhalation is the #1 route of exposure!**
- **"IDLH" = Immediately Dangerous to Life and Health:**
 - "...refers to an atmospheric concentration of any toxic, corrosive, or asphyxiate substance that poses an immediate threat to life or that would interfere with an individual's ability to escape from a dangerous atmosphere."



IDLH means the amount of a gas/vapor in the atmosphere that will either kill you or prevent you from escaping the danger. It is measured in PPM (parts per million) and is usually very, very small amounts.

SAFETY: SOME IDLH EXPOSURE VALUES:

• Acetone vapor	= 2500 ppm
• Ammonia gas	= 300 ppm
• Carbon Monoxide	= 1200 ppm
• Hydrogen Sulfide	= 100 ppm
• Hydrogen Cyanide	= 50 ppm
• Chlorine gas	= 10 ppm
• Toluene Diisocyanate	= 2.5 ppm
• Phosgene	= 2 ppm
• Sarin	= 0.03 ppm
• Mustard gas	= 0.0005 ppm.



PPM is parts per million. There are 400 sextillion (10^{21}) molecules in one cubic inch of air. A million is 10^6 . One part per million is approximately 1000 trillion (10^{15}) molecules in each cubic inch of air (1,000,000,000,000,000 molecules). We breathe in about 800 cc with each inspiration. So with each breath we could be inhaling nine times the amount that will kill us.

Toluene Diisocyanate comes from memory foam when burned (think about taking your SCBA off in a structure fire). Phosgene is a by-product of meth labs.

SAFETY: HOW DO YOU PROTECT YOURSELF?

- **#1: recognize any possible hazardous material**
- **#2: keep your distance, resist rushing in, approach uphill, upwind, upstream**
- **#3: use ALL your PPE...**



Why a picture of a structure fire? What is in there, on fire? What is under the sink, in the closets, in the garage?

#2: I = ISOLATION & IDENTIFICATION

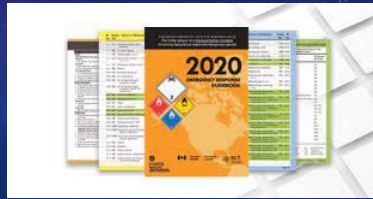
- Keep bystanders and other responders away
- Notify Dispatch and incoming units:
 - ***“This is a Hazardous Materials Incident”***
- Stage upwind/uphill if necessary
- Identify the product, if you can
- Establish ICS
- Flag isolation zones
- How large a zone?....



So for isolation we need to know how large of a zone to flag. Where do we get that information? THE EMERGENCY RESPONSE GUIDE!

ESTABLISH ISOLATION DISTANCE

- FRAs — usually isolate and deny entry by establishing the isolation distance;
- Use ERG recommendations.



This is where we really get good at using the ERG -



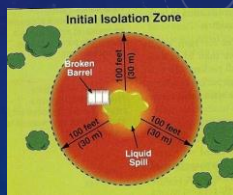
SECTION EIGHT

USING THE 2020 EMERGENCY RESPONSE GUIDE

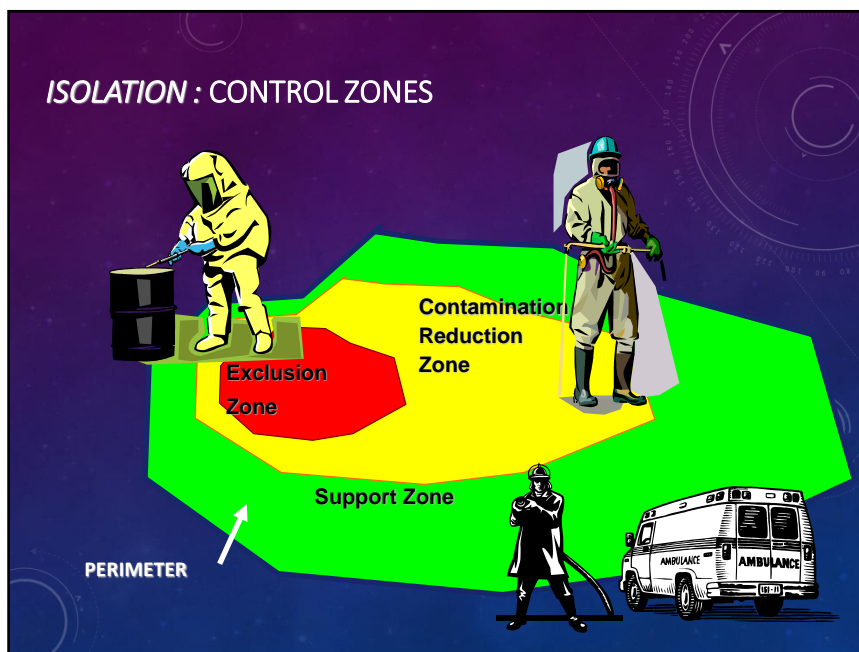
This section covers how we can protect ourselves by using what we DO have...

ISOLATION : CONTROL ZONES

- **Control Zones are established to:**
 - Secure the scene;
 - Control the spread of contamination from a hazardous materials release;
 - Ensure the safety and requisite control of emergency services personnel and operations;
 - Prevent personnel, vehicles, and other resources from entering a potentially hazardous area.



Exclusion/Hot Zone — Area of isolation (only responders with proper level of PPE, as directed by the Incident Commander)
Contamination Reduction/Warm Zone — Used to control areas such as Decontamination
Support/Cold Zone — Safe area for Command Post, Media, etc. (No protective clothing required)



Exclusion zone requires the highest level of PPE and knowledge – Tech/Spec only here to stop the release

CRZ – can be one step lower in PPE – used to reduce the contamination – usually 100 feet because the fire engines are in the support zone and can stretch a line to give the required water supply for decon

Support zone for everyone else – fire EMS, LE – no PPE is required here

EXCLUSION ZONE

- **Exclusion/Hot Zone/Red Zone:**
- **Highest degree of hazard**
- **Highest degree of PPE required**
- **Highest degree of certification required.**



This is the isolation zone we set per the ERG – and we do NOT go in there at the FRA or FRO levels.

CONTAMINATION REDUCTION ZONE

- Warm Zone / Contamination Reduction Zone/Yellow Zone:
- Lesser degree of hazard
- Probably a lesser degree of PPE required
- Where contamination is removed (decon).



Decontamination is performed in this zone – usually 100 feet out from the exclusion zone (because a fire engine in the green zone can stretch a 100 foot line easily into this zone).

CONTAMINATION REDUCTION ZONE

- **Emergency Decon:**
- **Used if there is an immediate threat to life**
- **Get the clothes off and water (lots of it) on**
- **Watch for hypothermia.**



And I MEAN emergency here – otherwise there would be a great deal of time needed to set up zones, containment areas and a process of gradually removing contaminated PPE.

This is get the clothes OFF, get water ON and then get the victim to a hospital.

NOTE: contaminated patients will NOT go by air ambulance (even post-decon) ONLY ground transport and the hospital must be notified

SUPPORT ZONE

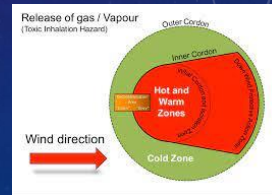
- Cold Zone / Support Zone/Green Zone:
- NO hazard
- No PPE required
- Where Fire/EMS and all others are staged.



Everyone else is here – no PPE is required in this zone.

PERIMETER CONTROL

- **Set the exclusion zone first!**
- **Determine size/extent of exclusion:**
 - Per ERG!
 - Downwind perimeter usually longer;
 - Can be 2-3 times larger than upwind
- **Use law enforcement units to secure entry points**
- **Use vehicles, barricades, cones, tape, personnel, fences, terrain, buildings, etc. to set perimeter.**



Set the exclusion zone first! Use law enforcement units to secure entry points. Set the downwind perimeter.

***ISOLATION* : LIMIT ENTRY TO HOT ZONE**

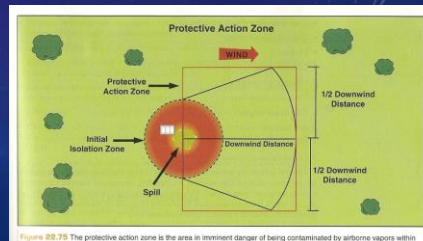
- **Isolate and deny entry:**
 - **NFPA 704 and DOT Placards are only estimates of the dangers**
 - **We may not even have *that***
- **After recognizing a hazardous material – keep everyone else away.**



Feel like you want to make the red zone even larger? Do it!

ISOLATION : CONTROL ACCESS

- Deny entry to all
- Stage responders not assigned
- Establish emergency exit procedures
- Establish control zones
- Watch for wind shifts
 - Why?.



Why watch for wind shifts? Because you will need to change the zones!

#2: I = ISOLATION & IDENTIFICATION

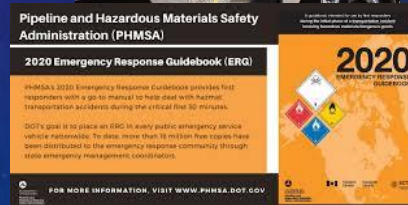
- How much of an isolation zone???
- You first have to identify it -
- USE YOUR INFORMATION SOURCES!



Identify it – then use the ERG to determine the size of the isolation zone

IDENTIFICATION: INFORMATION SOURCES

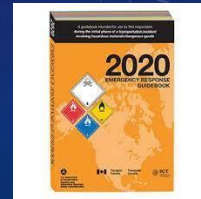
- Identify with:
 - NFPA 704 system
 - MSDS
 - DOT Placarded trucks/containers
 - Shipping Papers
- Then use the Emergency Response Guide.



Get all the information you can – then use the ERG. Here is the meat of this course – how to use the ERG

IDENTIFICATION: THE EMERGENCY RESPONSE GUIDE

- What we use for the first 30 minutes of a hazardous materials incident
- Published by the DOT
- New edition every four years
- THE ERG is our most valuable reference book – it is in all emergency vehicles per OSHA.



For the first 30 minutes of a hazmat incident -

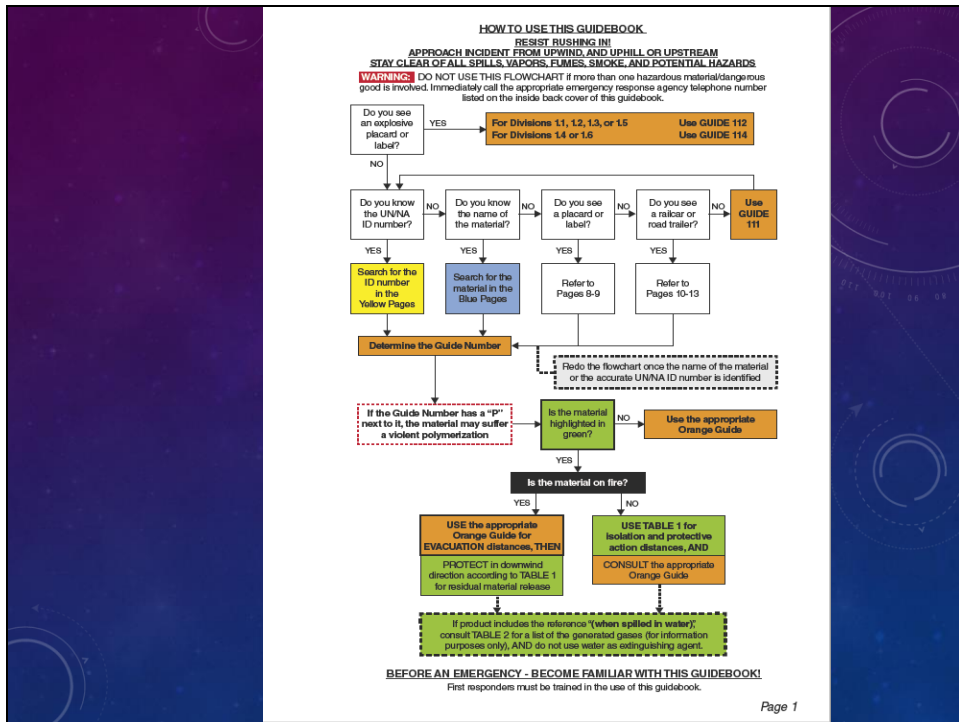
THE ERG

- Emergency Response Guide
- Check-out page ONE:
- Do you see an explosive placard or label?
 - Guide 112 or 114
- Do you know the UN/NA ID number?
 - If yes – use YELLOW pages
- Do you know the name of the material?
 - If yes – use BLUE pages
- Do you see a placard or label?
 - If yes – pages 8-9.



THE ERG is our most valuable reference book – it is in all emergency vehicles per OSHA.

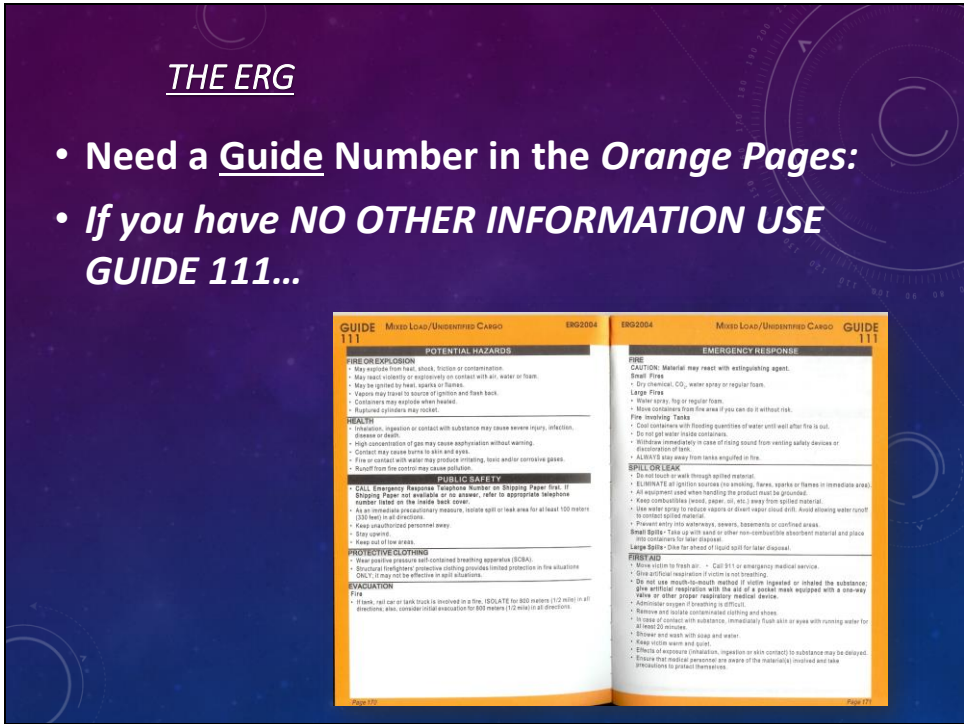
First look at page one – follow the flow chart



Pause here and turn to page one and go over the flowchart-

THE ERG

- Need a Guide Number in the *Orange Pages*:
- If you have **NO OTHER INFORMATION USE GUIDE 111...**



And remember: No other information – use guide number 111

THE ERG GUIDE PAGES

- 62 double orange guides, starting at Guide 111:
- Left side is safety related information
- Right side is emergency response information
- Three main sections:
 - #1: Potential hazards: fire/explosion or health (HWIKMF)
 - #2: Public safety: immediate isolation distances, recommended type of PPE/respiratory protection
 - #3: Emergency Response: including first aid and special precautions.

When you turn to a Guide Number you will have two pages to reference – at the top of the left page will be either the words “FIRE/EXPLOSION” or “HEALTH” – that is how this stuff will kill you first






GATHER INFORMATION BY CONTAINER SHAPE

- By rail car ID (pages 10-11)
- By Trailer ID (Pages 12-13)
- The circled number is the Guide to use.

ROAD TRAILER IDENTIFICATION CHART:

WARNING: Road trailers may be jacketed, the cross-section may look different than shown and external ring stiffeners would be invisible.

NOTE: An emergency shut-off valve is commonly found at the front of the tank, near the driver door.

117 MC331, TC331, SCT331		<ul style="list-style-type: none">• For liquefied compressed gases (e.g., LPG, ammonia)• Rounded heads• Design pressure between 100-500 psi**
117 MC338, TC338, SCT338, TC341, CGA341		<ul style="list-style-type: none">• For refrigerated liquefied gases (cryogenic liquids)• Similar to a "giant thermo-bottle"• Filling compartments located in a cabinet at the rear of the tank• MAWP between 25-500 psi**
131 DOT406, TC406, SCT306, MC306, TC306		<ul style="list-style-type: none">• For flammable liquids (e.g., gasoline, diesel)• Elliptical cross-section• Rollover protection at the top• Bottom outlet valves• MAWP between 3-15 psi**
112 TC423		<ul style="list-style-type: none">• For emulsion and water-gel explosives• Hopper-style configuration• MAWP between 5-15 psi**
137 DOT407, TC407, SCT307, MC307, TC307		<ul style="list-style-type: none">• For toxic, corrosive, and flammable liquids• Circular cross-section• May have external ring stiffeners• MAWP of at least 25 psi**

First – from the farthest away the container shape.

By container shape I mean the identification of the rail car or road trailer that is carrying the material. So, by staying farthest away from the incident we can make out the shape of the trailer – look for that shape on page 12 or 13 in the ERG, find the Guide Number and go to that guide page.

For example = see the next pages

GATHER INFORMATION BY CONTAINER SHAPE

- What is the immediate isolation distance for this incident?:
- **Guide #134**
- **75 feet**
- How far do you isolate?
- **75 feet**
- If it's on fire?
- **½ mile.**



You arrive on scene and see this: what is the immediate isolation distance?

First go to page 12-13 in the ERG – what is the name of this trailer? **Dry bulk container.**

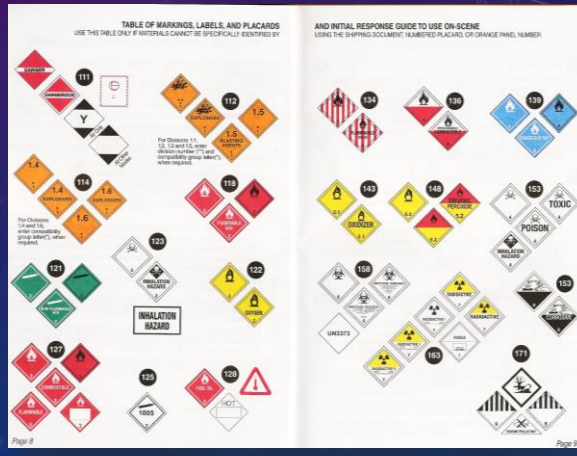
What is the Guide Number to use? **Guide 134, so turn to that guide page**

Under Public Safety – second bullet point – what is the immediate isolation distance to use here? **75 feet in all directions.** If it is a large spill – go for 330 feet (notice there is no distance for liquids because this is a DRY bulk container)

What if it is on fire? **½ mile** with an additional evacuation for that **½ mile** in all directions if needed.

GATHER INFORMATION BY DOT PLACARD

- By Placard (Pages 8-9)
- The circled number is the Guide to use.



Second – if you can get closer to see the color of the placard.

Binoculars is best for this because there are several different placards of each color.

Pages 8-9 have the placards in groups with a Guide Number by each group.

GETHER INFORMATION BY DOT PLACARD

- What is the immediate isolation distance for this placard?
- **Guide #171**
- **150 feet for liquids and at least 75 feet for solids**
- How far do you evacuate?
- **Increase, in the downwind direction, as necessary, the isolation distance shown under “PUBLIC SAFETY”**
- If it's on fire?
- **½ mile.**



What is the isolation distance for this placard? Class 9 placard

What is the Guide Number by this placard? Go to pages 8-9 and find the placard. **Guide Number 171**

Turn to the guide number 171 in the orange pages and go to the Public Safety section, second bullet point – isolate for isolate spill or leak area in all directions for at least 50 meters

(150 feet) for liquids and at least 25 meters (75 feet) for solids.

For evacuation distance - For nonhighlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under “PUBLIC SAFETY”.

If it is on fire – ½ mile in all directions.

GATHER INFORMATION BY UN IDENTIFICATION NUMBER

- What is the immediate isolation distance for:
UN #1270
- Guide #128
- 150 feet in all directions
- How far do you evacuate?
- Consider initial downwind evacuation for at least
300 meters (1000 feet)
- If it's on fire?
- ½ mile in all directions.

Take the number 1270 to the yellow pages – there are two entries for this number – but they both have the same guide number: for a Guide Number of 128

Go to Guide #128

Find the initial isolation distance in the Public Safety section – 150 feet in all directions

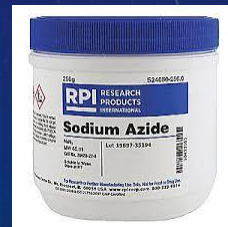
What is the evacuation distance? Consider initial downwind evacuation for at least 300 meters (1000 feet).

If it is on fire? (1/2 mile) in all directions

What is this material's primary hazard? Flammability - fire or explosion

GATHER INFORMATION BY NAME

- What is the immediate isolation distance for: Sodium Azide
- **Guide #153**
- **150 feet for liquids and at least 75 feet for solids**
- How far do you evacuate?
- **Increase, in the downwind direction, as necessary, the isolation distance shown under “PUBLIC SAFETY”**
- If it's on fire?
- **½ mile.**



So you have a name – Sodium Azide - go to the blue pages (alphabetical) for the guide number

We have a Guide number 153 –

Which suggests you isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

What about evacuations? See Table 1 - Initial Isolation and Protective Action Distances for highlighted materials. For nonhighlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under “PUBLIC SAFETY”.

On fire – ½ mile.

What is its primary hazard?

HEALTH

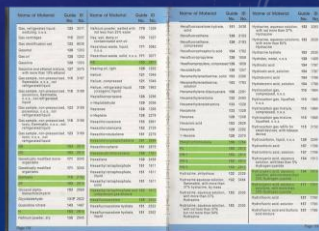
- **TOXIC**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.

- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution

And what is this green highlighted part?

THE ERG: HIGHLIGHTED IN GREEN

- Means the material is a toxic inhalation hazard:
- For entries highlighted in green follow these steps:
- **IF THERE IS NO FIRE:**
- -- Go directly to **Table 1 (green bordered pages)**
- -- Look up the ID number of the material
- -- Identify initial isolation and protective action distances:
 - Large/small spill, day/night
- See pages **289- 295** for instructions.



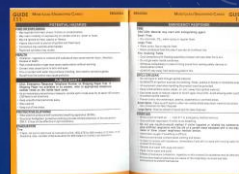
The image shows a screenshot of the Emergency Response Guidebook (ERG) interface. It displays a table with multiple columns, including 'Name of Material', 'ID No.', 'Name of Material', 'ID No.', and 'Name of Material'. Several rows in the table are highlighted in green, indicating toxic inhalation hazards. The table is organized into sections, and the highlighted entries are scattered throughout the visible portion of the document.

If any number or name is highlighted it means it is a potential toxic inhalation hazard. Go first to the green pages for the initial isolation distance. For the apps – for the iPhone there is an icon at the lower right corner called Protective Distance – tap on that to take you to the applicable green pages

For the Android – simply swipe left to show the applicable green pages

THE ERG: HIGHLIGHTED IN GREEN

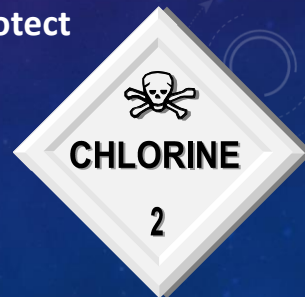
- **IF THERE IS A FIRE or A FIRE IS INVOLVED:**
- -- Also consult the assigned orange guide pages
- -- If applicable, apply the evacuation information shown under PUBLIC SAFETY.



Go first to the green pages for the initial isolation distance, then also consult the orange guide pages if it is on fire

HIGHLIGHTED MATERIAL

- What is the immediate isolation distance for: Chlorine (#1017)
- Guide #124 – **but it is highlighted in green**
- What is the distance for a small spill at night –
 - First isolate for 200 feet, then protect downwind for 0.7 mile.



How about chlorine #1017 – first look it up in either the yellow pages (with the number) or the blue pages (name) - and we see that it is highlighted in green.

So we first take the number 1017 to the green pages –

For a small spill at night – first isolate for 60 m (200 ft) THEN protect downwind for 1.1 km (0.7 mi)

THE ERG: HIGHLIGHTED

- In Table 1:
- If the words “When Spilled In Water” follow the name – take the ID number to table two...
- Table 2 – water reactive materials which produce toxic gases
- Instructions on Page 346.

TABLE 1.1 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

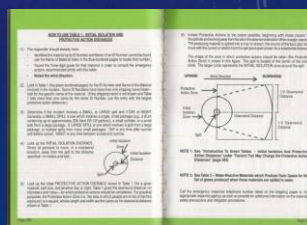
Table 1.1 lists materials that produce toxic gases when spilled in water. The table includes columns for ID No., Name of Material, and the Toxic Gas Produced.

ID No.	Name of Material	Toxic Gas Produced
1000	Acetylene	HCN
1001	Aluminum	HCN
1002	Aluminum hydride	HCN
1003	Aluminum nitride	HCN
1004	Aluminum phosphide	PH ₃
1005	Aluminum silicide	PH ₃ , SiH ₄
1006	Aluminum sulfide	PH ₃ , H ₂ S
1007	Aluminum telluride	PH ₃ , H ₂ Te
1008	Aluminum trihydride	HCN
1009	Aluminum trisulfide	PH ₃ , H ₂ S
1010	Aluminum tritelluride	PH ₃ , H ₂ Te
1011	Aluminum triphosphide	PH ₃
1012	Aluminum triarsenide	PH ₃
1013	Aluminum triantimonide	PH ₃
1014	Aluminum triarsenide	PH ₃
1015	Aluminum triantimonide	PH ₃
1016	Aluminum triarsenide	PH ₃
1017	Aluminum triantimonide	PH ₃
1018	Aluminum triarsenide	PH ₃
1019	Aluminum triantimonide	PH ₃
1020	Aluminum triarsenide	PH ₃
1021	Aluminum triantimonide	PH ₃
1022	Aluminum triarsenide	PH ₃
1023	Aluminum triantimonide	PH ₃
1024	Aluminum triarsenide	PH ₃
1025	Aluminum triantimonide	PH ₃
1026	Aluminum triarsenide	PH ₃
1027	Aluminum triantimonide	PH ₃
1028	Aluminum triarsenide	PH ₃
1029	Aluminum triantimonide	PH ₃
1030	Aluminum triarsenide	PH ₃
1031	Aluminum triantimonide	PH ₃
1032	Aluminum triarsenide	PH ₃
1033	Aluminum triantimonide	PH ₃
1034	Aluminum triarsenide	PH ₃
1035	Aluminum triantimonide	PH ₃
1036	Aluminum triarsenide	PH ₃
1037	Aluminum triantimonide	PH ₃
1038	Aluminum triarsenide	PH ₃
1039	Aluminum triantimonide	PH ₃
1040	Aluminum triarsenide	PH ₃
1041	Aluminum triantimonide	PH ₃
1042	Aluminum triarsenide	PH ₃
1043	Aluminum triantimonide	PH ₃
1044	Aluminum triarsenide	PH ₃
1045	Aluminum triantimonide	PH ₃
1046	Aluminum triarsenide	PH ₃
1047	Aluminum triantimonide	PH ₃
1048	Aluminum triarsenide	PH ₃
1049	Aluminum triantimonide	PH ₃
1050	Aluminum triarsenide	PH ₃
1051	Aluminum triantimonide	PH ₃
1052	Aluminum triarsenide	PH ₃
1053	Aluminum triantimonide	PH ₃
1054	Aluminum triarsenide	PH ₃
1055	Aluminum triantimonide	PH ₃
1056	Aluminum triarsenide	PH ₃
1057	Aluminum triantimonide	PH ₃
1058	Aluminum triarsenide	PH ₃
1059	Aluminum triantimonide	PH ₃
1060	Aluminum triarsenide	PH ₃
1061	Aluminum triantimonide	PH ₃
1062	Aluminum triarsenide	PH ₃
1063	Aluminum triantimonide	PH ₃
1064	Aluminum triarsenide	PH ₃
1065	Aluminum triantimonide	PH ₃
1066	Aluminum triarsenide	PH ₃
1067	Aluminum triantimonide	PH ₃
1068	Aluminum triarsenide	PH ₃
1069	Aluminum triantimonide	PH ₃
1070	Aluminum triarsenide	PH ₃
1071	Aluminum triantimonide	PH ₃
1072	Aluminum triarsenide	PH ₃
1073	Aluminum triantimonide	PH ₃
1074	Aluminum triarsenide	PH ₃
1075	Aluminum triantimonide	PH ₃
1076	Aluminum triarsenide	PH ₃
1077	Aluminum triantimonide	PH ₃
1078	Aluminum triarsenide	PH ₃
1079	Aluminum triantimonide	PH ₃
1080	Aluminum triarsenide	PH ₃
1081	Aluminum triantimonide	PH ₃
1082	Aluminum triarsenide	PH ₃
1083	Aluminum triantimonide	PH ₃
1084	Aluminum triarsenide	PH ₃
1085	Aluminum triantimonide	PH ₃
1086	Aluminum triarsenide	PH ₃
1087	Aluminum triantimonide	PH ₃
1088	Aluminum triarsenide	PH ₃
1089	Aluminum triantimonide	PH ₃
1090	Aluminum triarsenide	PH ₃
1091	Aluminum triantimonide	PH ₃
1092	Aluminum triarsenide	PH ₃
1093	Aluminum triantimonide	PH ₃
1094	Aluminum triarsenide	PH ₃
1095	Aluminum triantimonide	PH ₃
1096	Aluminum triarsenide	PH ₃
1097	Aluminum triantimonide	PH ₃
1098	Aluminum triarsenide	PH ₃
1099	Aluminum triantimonide	PH ₃
1100	Aluminum triarsenide	PH ₃

If a material is highlighted in green and ALSO says “When Spilled in Water” then take that name to Table 2 for the substance it produces when wet

THE ERG: HIGHLIGHTED

- Look at: # 1397 Aluminum phosphide (when spilled in water)
- Take #1397 to Table 2
- It produces PH₃: Phosphine (IDLH = 50 ppm)
- Look up Phosphine in the Blue Pages – what Guide Number?
- Guide #119.



Calcium phosphide insecticide – in Table 1

Take #1397 to Table 2 – what gas does it produce? Phosphine with has an IDLH of 50 ppm – pretty nasty stuff

But this scenario can't really happen = can it????

REMEMBER THIS?

- Ignoring the hazards of a green highlighted material can kill.

4 children dead, 6 people hospitalized following 'HAZMAT incident' in Northeast Amarillo



REMEMBER: AFD said someone at the residence had placed a pesticide, which is now identified as Weevil-Cide, containing **aluminum phosphide (UN #1397**, Guide Number 139) underneath the house. At some point, a person living at the home **tried to wash away the pesticide with water**. This caused a chemical reaction that created **phosphine gas**, which is extremely dangerous. Phosphine gas causes pulmonary edema and extreme respiratory distress. (IDLH 50 ppm)

The only way to keep ourselves safe is to be aware of what is out there and how it can hurt us.

This is where FRA – First Responder Awareness training comes in.

THE ERG: TABLE 3

- **Table 3 – isolation distances for large quantities (more than 208 liters or 55 US gallons) of 6 common toxic gases:**
 - **Ammonia, anhydrous (UN1005)**
 - **Chlorine (UN1017)**
 - **Ethylene oxide (UN1040)**
 - **Hydrogen chloride, anhydrous (UN1050) and Hydrogen chloride, refrigerated liquid (UN2186)**
 - **Hydrogen fluoride, anhydrous (UN1052)**
 - **Sulfur dioxide/Sulphur dioxide (UN1079)**

Page 354.

Six chemicals that are TIH and are transported in large quantities are in table 3

THE ERG: THE LETTER “P”

- A Guide Number with a “P” means the material may undergo a violent polymerization reaction if subjected to heat or contamination:
- This term describes a chemical reaction which is generally associated with the production of plastic substances
- (By “violent polymerization reaction” we mean it explodes).



What does the “P” mean? It could explode

BLEVE

- **Boiling liquid, expanding vapor explosion**
- **Occurs when a tank storing liquid fuel under pressure is heated excessively.**



Speaking of explosions – the BLEVE is a very rare, but potential killer of firefighters who forget what it means

BLEVE

- **Sequence:**

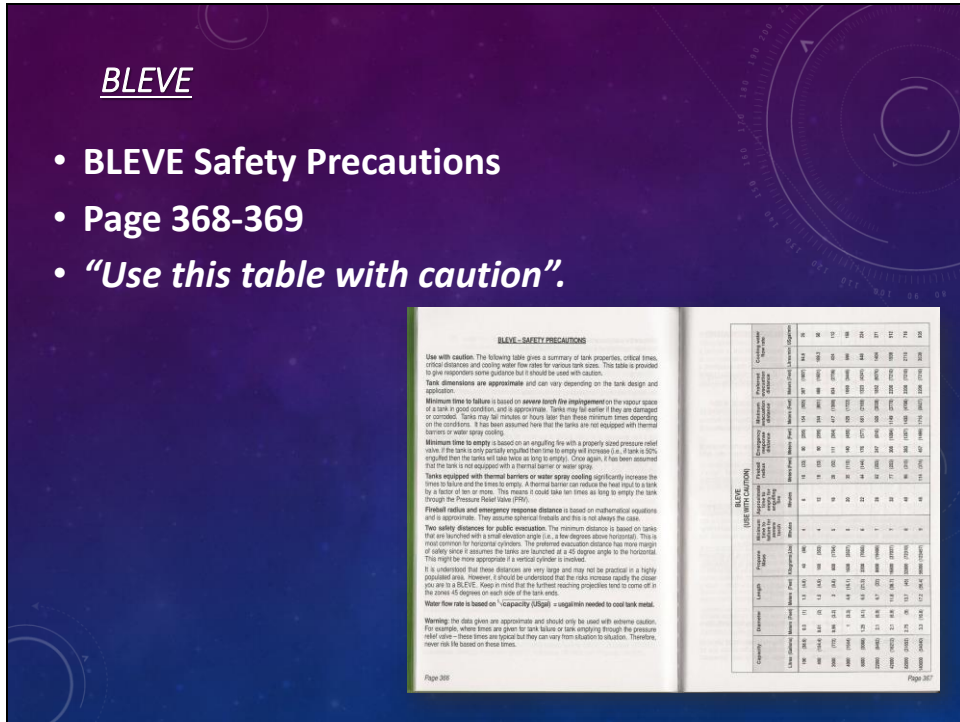
- Tank is heated
- Internal pressure rises beyond ability to vent
- Tank fails catastrophically
- Liquid fuel at or above boiling point is released
- Liquid immediately turns into a rapidly expanding cloud of vapor
- Vapor ignites into a huge fireball.



You can find many videos demonstrating the BLEVE on You Tube.

BLEVE

- BLEVE Safety Precautions
- Page 368-369
- "Use this table with caution".



I personally would not use this table – if I think there is a possibility of a BLEVE I go far, far away. Running...

For the apps – tap Reference Materials, tap Safety Precautions, tap BLEVE Capacities

BLEVE: FOR INSTANCE

- BLEVE chart in the ERG – page 369:
- Gives minimum time to failure, approximate time to empty, fireball radius, emergency response distance, evacuation distance (minimum and preferred) and cooling water flow rate
- What is the time to failure for a 42 foot long (18,000 gal) tank?

What is a “safe distance”? Using the chart for a 42 foot long tank? 18,000 gal – **9 minutes to fail, fireball radius 374 feet, response distance 1499 feet (0.3 mile)**

BLEVE

BLEVE (USE WITH CAUTION)

Capacity	Diameter	Length	Propane Mass	Minimum time to failure for severe torch	Approximate time to empty for engulfing fire	Fireball radius	Emergency response distance	Minimum evacuation distance	Preferred evacuation distance	Cooling water flow rate	
Litres (Gallons)	Meters (Feet)	Meters (Feet)	Kilograms(Lbs)	Minutes	Minutes	Meters(Feet)	Meters (Feet)	Meters (Feet)	Meters (Feet)	Litres/min	USgal/min
100 (38.6)	0.3 (1)	1.5 (4.9)	40 (88)	4	8	10 (33)	90 (295)	154 (505)	307 (1007)	94.6	25
400 (154.4)	0.61 (2)	1.5 (4.9)	160 (353)	4	12	16 (53)	90 (295)	244 (801)	488 (1601)	189.3	50
2000 (772)	0.96 (3.2)	3 (9.8)	800 (1764)	5	18	28 (92)	111 (364)	417 (1368)	834 (2736)	424	112
4000 (1544)	1 (3.3)	4.9 (16.1)	1600 (3527)	5	20	35 (115)	140 (459)	525 (1722)	1050 (3445)	598	158
8000 (3088)	1.25 (4.1)	6.5 (21.3)	3200 (7055)	6	22	44 (144)	176 (577)	661 (2169)	1323 (4341)	848	224
22000 (8492)	2.1 (6.9)	6.7 (22)	8800 (19400)	7	28	62 (203)	247 (810)	926 (3038)	1852 (6076)	1404	371
42000 (16212)	2.1 (6.9)	11.8 (38.7)	16800 (37037)	7	32	77 (253)	306 (1004)	1149 (3770)	2200 (7218)	1938	512
82000 (31652)	2.75 (9)	13.7 (45)	32800 (72310)	8	40	96 (315)	383 (1257)	1435 (4706)	2200 (7218)	2710	716
140000 (54040)	3.3 (10.8)	17.2 (56.4)	56000 (123457)	9	45	114 (374)	457 (1499)	1715 (5627)	2200 (7218)	3539	935

9 minutes – but do you care?

NINE MINUTES – you should be far, far away by then if you even suspect a BLEVE

Improvised Explosive Device (IED)

- Another fun chart in the ERG -
- An improvised explosive device is a bomb that is manufactured from commercial, military or homemade explosives
- A Safe Standoff Distance Chart for various threats when improvised explosive device are involved is found on page 374.



Run away, screaming...

THE ERG

- Pages 388-392 for important phone numbers:
- CHEMTREC
- Military
- Poison Control.

EMERGENCY RESPONSE TELEPHONE NUMBERS	
CANADA	
1. CANUTEC, provides a 24 hour national bilingual (French and English) emergency response advisory service:	613-996-6666 *
	*666 (STAR 666) cellular (in Canada only)
UNITED STATES	
1. CHEMTREC, a 24 hour emergency response communication service:	1-800-424-9300 *
	(Toll-free in the U.S., Canada and the U.S. Virgin Islands) 703-527-3887 For calls originating elsewhere
2. CHEMTEL, INC., a 24 hour emergency response communication service:	1-888-255-3924 *
	(Toll-free in the U.S., Canada, Puerto Rico and the U.S. Virgin Islands) 813-248-6985 For calls originating elsewhere
3. INFOTRAC, a 24 hour emergency response communication service:	1-800-535-5053 *
	(Toll-free in the U.S., Canada and the U.S. Virgin Islands) 352-323-3500 For calls originating elsewhere
4. 3E COMPANY, a 24 hour emergency response communication service:	1-800-451-8346 *
	(Toll-free in the U.S., Canada and the U.S. Virgin Islands) 760-602-8703 For calls originating elsewhere
The emergency response information services shown above have requested to be listed as providers of emergency response information and have agreed to provide emergency response information to all callers. They maintain periodically updated lists of state and Federal radiation authorities who provide information and technical assistance on handling problems involving radioactive materials.	
5. MILITARY SHIPMENTS, for assistance at incidents involving materials being shipped by, for, or to the Department of Defense (DOD), call one of the following numbers (24 hours):	703-697-0218 * - Explosives/ammunition incidents (U.S. Army Operations Center) 1-800-851-8061 (Toll-free in the U.S.) - All other dangerous goods incidents (Defense Logistics Agency)
6. NATIONWIDE POISON CONTROL CENTER (United States only)	1-800-222-1222 (Toll-free in the U.S.)

* Collect calls are accepted

CHEMTREC's® primary mission is to provide vital information quickly and accurately 24- hours a day for transportation incidents

The phone call is toll-free (800) 424-9300; there is no charge to the caller for this service

The website address is: www.chemtrec.com.

Now – let's put this information to use -

ERG EXERCISE: FIND THE GUIDE

- You are called to a motor vehicle accident with spill (of something)
- *Even before you reach the scene you can use what Guide Number?*

GUIDE 111

ERG EXERCISE: FIND THE GUIDE

- First on scene – you see this tank truck:
- Based on the tank shape: First Guide Number to use?



Oval cross section – see page 12 in your ERG – **Guide Number 131**

What is your initial isolation zone? **50 meters / 150 feet in all direction with no fire**

Main hazard is? **Health by Guide 131**

ERG EXERCISE: FIND THE GUIDE

- Using binoculars you see a number on the placard:
- Based on the yellow pages: what is the Guide Number to use?



3475 is several things: but they ALL have **Guide Number 127**

ERG EXERCISE: FIND THE GUIDE

- Based on the Yellow Pages: Find the Guide Number By ID Number:
- 3065
- 1365
- 1654
- 1325
- 2794
- 1356
- 3069.

3065 = Alcoholic Beverages

1365= Cotton, wet

1654= Nicotine

1325= Fusee

2794= Batteries, wet filled with acid

1356= TNT

3069 = Not there! Remember – not everything will be in the ERG

ERG EXERCISE: FIND THE GUIDE

- **Based on the Blue Pages: By Material Name:**
 - **Ammonia, Anhydrous**
 - **Butyl Acrylates, stabilized**
 - **Chlorine trifluoride**
 - **Hafnium Powder, dry**
 - **Aluminum Phosphide Pesticide**
 - **Sarin.**

Anhydrous ammonia = 125 green highlighted

Butyl acrylates – 129P

Chlorine trifluoride = 124 green highlighted

Hafnium powder – 135

Aluminum phosphide – 157 green highlighted

Sarin – 153 green highlighted

ERG EXERCISE: ON THE ROAD

- You see this blue barrel off the side of the road
- How do you identify it?
- What ERG Guide number would you use?
- Primary hazard?

- Immediate isolation distance?

- Potential hazards?



ID by the red placard – flammable liquid class 3

ERG Guide Number by the table of placards page 8 – Guide 127

Primary Hazard – Fire/Explosion

Immediate Isolation Distance – 50 meters / 150 feet in all directions

Potential Hazards – some (ethanol) may burn with an invisible flame (oh fun!)

ERG EXERCISE: PARKING LOT

- You respond to a damaged tank in the “1850” restaurant parking lot
- How do you identify it?
- What Guide Number?
- Primary Hazard?
- _____
- Isolation?
 - _____ feet
- Other immediate actions?
 - _____



ID by shape – tanks of this sort usually hold propane

Guide Number 115

Primary Hazard Fire/Explosion

Isolation – 100 meters / 330 feet in all directions

Other immediate actions – eliminate ignition sources, heavier than air so it may flow down hill to find an ignition source

ERG EXERCISE: UNKNOWN

- Mop up on a vegetation fire found this suspicious trash
- What could it be?.



It COULD be waste from a methamphetamine production - very hazardous (and they don't label things like this for us)

ERG EXERCISE: UNKNOWN

- What ERG Guide would you use for this?
- How far should you immediately isolate the area around the spill?
 - _____ feet
- What problems do you have using the ERG for this incident?



Guide Number 111

Isolate for 330 feet in all directions

Problems include it being so generalized that we might be panicking over household trash – but who cares? HOW DO WE KEEP OURSELVES SAFE?



SECTION NINE

NOTIFICATION

This section covers who we notify

SIN REVIEW

- Number One Priority for FRA is - SAFETY
- Number Two Priority for FRA is...
- IDENTIFY & ISOLATE!
- *Number Three is???*



What is next?

#3: N = NOTIFICATION

- **Notify dispatch**
- **Notify duty Chief / Dispatch of a Hazardous Materials Incident**
- **Request Law Enforcement for IC / crowd control / traffic control.**



Notify everyone – get the word out there so they will all know. Don't let anyone go splashing through it.

SUMMARY

- ***Recognizing*** a potential hazardous material is of primary importance
- **Then SIN:**
 - Always consider safety first
 - Next step is to isolate/identify
 - Then make notifications.



Safety, isolation then notification. AND don't let anyone tell you "it's probably nothing..."

Because what if it is something ????????



BE SAFE OUT THERE...

THANK YOU!

Let's take the test – you can use your ERG/ERG app and your IRPG on the test. Be sure to save it as your name and email back for evaluation and for your Completion Certificate.

Email to: kreamowheat@sbcglobal.net