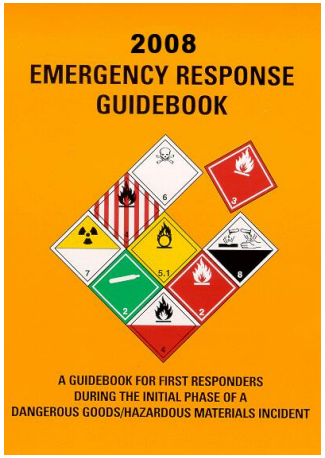
HOSE COMPANY 2 - WESTBURY FIRE DEPT.

ANNUAL HAZ-MAT REFRESHER



ANNUAL
HAZAROUS MATERIAL OPERATIONS
REFRESHER TRAINING

Ver. 2012.1

Annual Hazardous Material Refresher

COURSE OBJECTIVES:

1. Reviews the Departments Role and Objectives at a Hazardous Material Incident.
2. Review use of an Emergency Response Guidebook (ERG)
3. Review fulfill the Departments Objectives using an ERG
4. Review some Haz-Mat terminology we all should all know,
5. Review Metering and Monitoring
6. Review Principles of Control, Contain, Confine & Extinguish
7. Review Methods & Process of Decontamination

Annual Hazardous Material Refresher

<u>Public Safety - “Duty to Act”</u>

All Public Safety Responders have a “Duty to Act” under the law.

The level of involvement, is defined by each agencies Emergency Response Plan (ERP).

Westbury F.D. – as with most Fire Dept. nationally are expected operate to the “**Operations Level**” at a Hazardous Material Incident.

What does that mean?

Annual Hazardous Material Refresher

Five Levels of Training in Haz-Mat:

- First Responder Awareness Level
  (Required for all First Responders)
- ***First Responder Operational Level***
- Hazardous Materials Technician
- Hazardous Materials Specialist

broken down into specific items: Transportation, Storage, Use…

- Hazardous Materials Incident Commander

Awareness & Operations – Defense
Technicians & Specialists – Offense
IC – Head Coach

Annual Hazardous Material Refresher

First Responder Operations Level

***OSHA minimum requirement* = 16 hours Awareness Level training + 8 hours training at Operations level**
(24 hours operations level training is also a prerequisite to take technician and/or incident commander training)

- First responders at the operations level are those individuals who respond to releases or potential releases, as part of the initial response to protect people, property, and the environment.

- Operations-level first responders are trained to take **defensive actions** rather than try to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. OSHA 1910.120 requires that first responders at the operations level receive at least 8 hours of training above the basic awareness level training or have sufficient experience to demonstrate competencies objectively.

All First responders must have the knowledge of the Awareness Level, and they are required to :

- Know basic hazard and risk assessment
- Know how to select and use protective equipment provided to the first responder
- Understand basic hazardous materials terms.
- Know how to perform basic control, containment, and/or confinement operations within the capabilities of their resources and protective equipment
- Know basic decontamination procedures
- Understand relevant SOP's and termination procedures

As per - FEMA Guidelines for Haz Mat/WMD Response, Planning and Prevention Training

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Employers' Training Requirements :

Employers must ensure that employees receive training in emergency response to hazardous materials incidents, based on their expected duties and functions. Such training must be performed before employees are permitted to perform in emergencies. (We must train to Operations Level)

An **employer** is responsible for determining the appropriate level of training required, based on actions expected of employees as stated in the agency's SOP's. (We must train to Operations Level since we're an Op's level service)

An **employer** is responsible for implementing the required training. Emphasis should be on achieving the required competencies for the appropriate level of response rather than on minimal requirements for length of training. (Items covered in that Level of training is more important to Length of the Training)

An **employe**r is responsible for selecting qualified, competent instructors. (recommend teacher = 1 level above)

An **employer** must provide annual refresher training sufficient to maintain competencies, or employee must demonstrate required competencies annually.

An **employe**r must maintain a record of demonstrated competencies including an explanation of how each competency was demonstrated. Training records must contain dates of training, student rosters, curriculum outlines, demonstration checklists or performance records and evaluation tools, and scores, if appropriate.

As per - FEMA Guidelines for Haz Mat/WMD Response, Planning and Prevention Training

Annual Hazardous Material Refresher

Refresher Training

OSHA minimum requirement - annual refresher training or recertification for all levels

All **employees** who may respond to hazardous materials emergencies must receive refresher training on an annual basis or have experience that ensures their competency to perform their roles safely and efficiently.

Employers must certify on an annual basis that employees continue to meet the performance objectives as defined in OSHA 1910.120. This may be accomplished through refresher training or demonstration of competency.

Refresher training or competency retesting requirements vary for each of the response levels.
In general, refresher training should include critical skills practice, technical information updates, and refinement of incident scene coordination through field exercises simulating emergencies.
At a minimum, competency should be demonstrated in all refresher training for the skills directly affecting the safety of responding personnel.

Minimum hours for annual refresher training for response personnel are not specified in OSHA 1910.120(q). However, in practice, many jurisdictions use the 8-hour minimum refresher training requirement for site workers in OSHA 1910.120(e) as a guide.

As per - FEMA Guidelines for Haz Mat/WMD Response, Planning and Prevention Training

Annual Hazardous Material Refresher

First Responder Awareness Level

Competencies include: -

• Understanding what a hazmat is and the role of the first responder.

• Ability to recognize and identify a HazMat.

• ***First Responder Operational Level***

Competencies include: -

• All of Awareness Level's Plus-

• Understanding of hazmat terms, basic hazard and risk assessment, and the role of first responder at operational level.

• Ability to perform basic control, containment and/or confinement techniques with proper use or personal protective equipment and following standard operating procedure.

• Ability to implement basic decontamination procedures.

As per - FEMA Guidelines for Haz Mat/WMD Response, Planning and Prevention Training

Annual Hazardous Material Refresher

Our Primary Objectives at the *Operations Level* are to:

Recognition

Isolation

Protection

Notification

Then we will Assist,
Technicians and/or Specialist as needed

Operations Level also play a vital role in the Decontamination
under the guidance of the Tech / Specialist

Annual Hazardous Material Refresher

CO ALARM CALLS – Are they a Haz-Mat Call?

YES – for 2 reasons

1. CO is Toxic gas that will asphyxiate you
2. This gases remove O2 making an O2 deficient environment

What do we do at this calls?

Recognition – using our PPE and meters,
we check the environment (Recognizing if there is a Hazard).

Isolation – remove occupants from area
(setting safe boundaries – until determination can be made)

Protection – Control the source of CO,
Use fans to clear CO.

Notification – Key-Span Energy to repair
and notify occupants of the potential hazard.

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What is a Hazardous Materials:

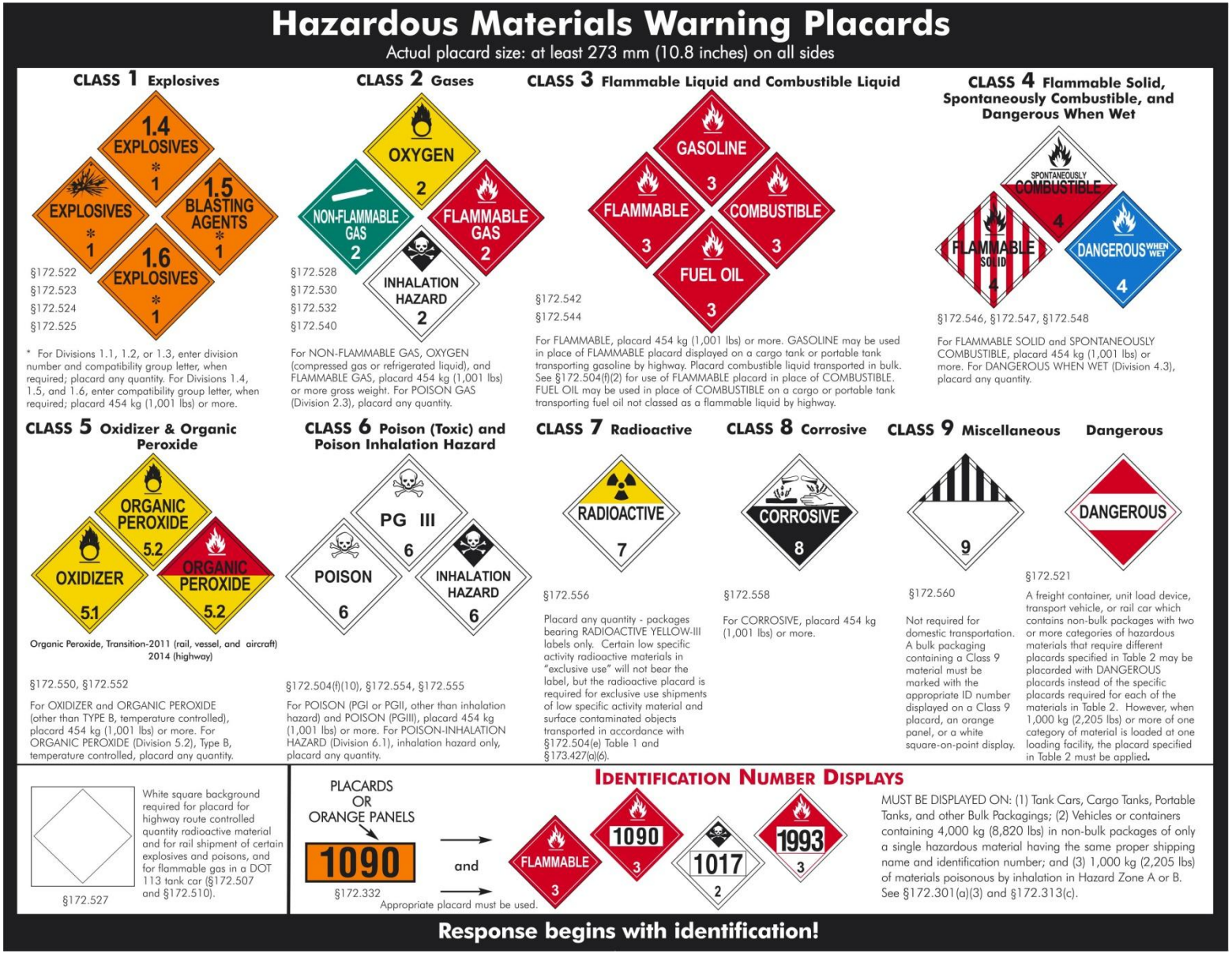
A hazardous material is **any item or agent** (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.

Is an Oxygen deficient environment a hazardous material incident?

According to definition **NO**, but we need to understand, what has taken the place of the Oxygen in the air?
(*in most cases a hazardous gas*)

Annual Hazardous Material Refresher

Review - 9 Classes of Hazardous Material:



Annual Hazardous Material Refresher

Review - Haz-Mat Terminology Review:

SOLID – LIQUID – GAS : the states in which matter exists (when asked what state the answer is **Not** NY, NJ or TX…)

Boiling Point : temperature makes a liquid into a gas

Melting Point : temperature make a solid into a liquid

Freezing Point : temperature make a liquid into a solid

Condensation – change of a gas into a liquid

Specific Gravity: the weight of a solid or liquid in water (does it float or sink) – remember water is 1

Vapor Density: weight of gas in the air (does it lift or sink)

Vapor Pressure: the force exerted by the vapor against the air or container containing it

Volatility: how easily the liquid or solid will evaporate

Ignition Temperature: minimum temperature needed to initiate combustion and sustain burning (unlike Flash Temp.)

Flash Point: minimum temperature in which a liquid gives off enough vapors to ignite in air

LEL – Lower Explosive Limit: the minimum concentration of a flammable vapor in air that could ignite (too little - too lean)

UEL – Upper Explosive Limit: the maximum concentration of a flammable vapor in air that could ignite (too much - too rich)

pH (Power of Hydrogen): measure of acid/base in a liquid (7 neutral, <7 = acid, >7 base)

Annual Hazardous Material Refresher

Alpha Radiation: larges radiation particles – travel 1-2" in air, skin is enough protection

Beta Radiation: smaller particles then alpha – travel 12' in air, will penetrate skin and burn – Turnout w/ face protection needed

Gamma Radiation: very small and powerful – travel 186,000 miles per second – thick concrete or lead needed

Controlled Access:

Site safety control plan: IC plan that defines the Hot , Warm and Cold zones

Hot Zone: (aka **exclusion zone**) – the immediate area around the spill where contamination **will occur**

Warm Zone: (aka **contamination reduction zone**) – the zone between contaminated and safe support area
area where you'll need **less** PPE then hot zone, and area where we'll be doing or decontaminating

Cold Zone: (aka **support zone**) – safe zone where PPE is not required and were we stage our personnel

Assessing a Risk:

Flammable: will ignite and burn

Toxic: substance that can cause damage to living organisms, includes plant life – (include: **Corrosives** – damage at contact, **Asphixiants** – take away O2, **Irritants** – cause inflammation eyes…, **Teratogens** – effect your future children, **Mutagens** – changes dna, **Carcinogens**- Cause cancer, **Sensitizers** – cause allergic reactions with repeated exposure)

Corrosive: substance that will destroy or irreversibly damage another surface or substance to which it comes into contact. The main hazards to people include damage to the eyes, nose, throat & skin tissue.

Reactive: a substance that will invoke a reaction when subjected to another substance. In most case we're talking air or water.

Annual Hazardous Material Refresher

Terminology Review:

Factors of Exposure:

Absorption: contact with skin
Inhalation: Breathed in
Ingestion: consumed – eat or drink
Injection: through sharps

When we talk exposure it could be People, Animals, Plants, Property or the Environment all could be exposed.

Factors Contributing to Additional Risks:

Weather: Cold/Heat , Rain/Snow, Winds

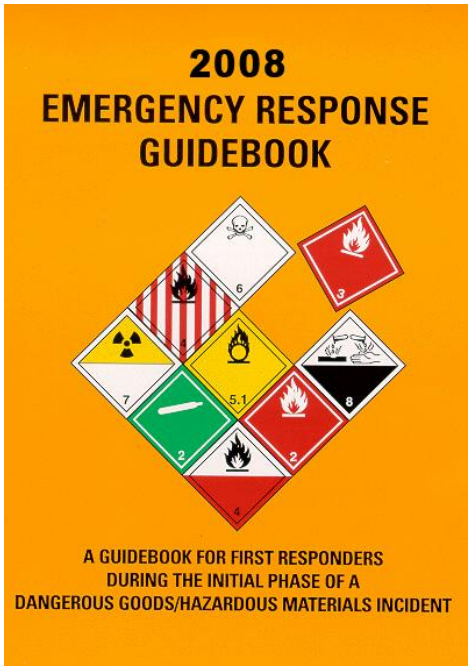
Terrain: elevations, waterways, drainage

Recourse availability to us: what's immediately available or how fast can they get here
• amount of qualified responders
• amount of needed equipment

Always Remember - We should only be work within our training and equipment level available to us

These Factors will all effect how we deal with the Hazardous Material.

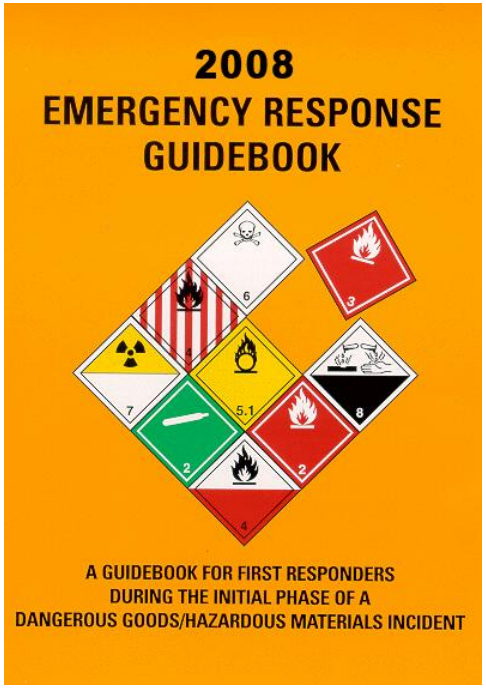
Annual Hazardous Material Refresher



The Primary Tool we us as *Operations Level Responder* to meet our objectives:

Emergency Response Guidebook - ERG

Review the use of an Emergency Response Guide



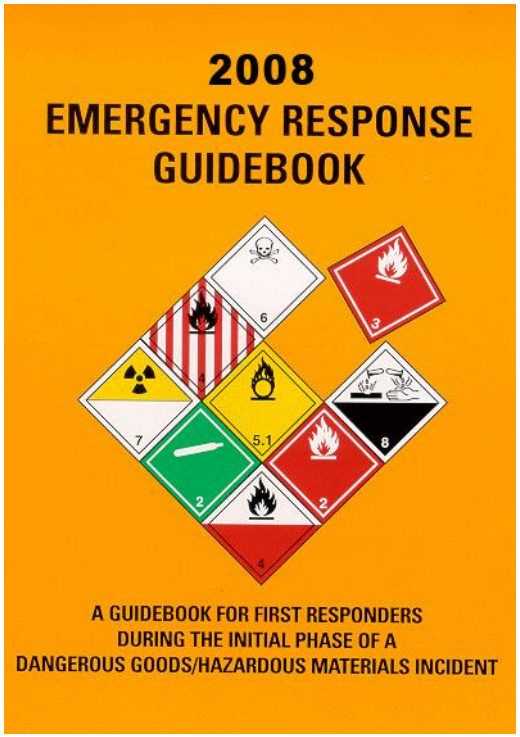
An EGR is a printed guide -
used in the "initial response phase" of an incident
(the period following arrival on scene , and the
identification of dangerous substance is confirmed)

then we will initiate
Securing Measures and Protective Actions
and
Request ***assistance*** from qualified personnel (if nec.)

Remember our Objectives at Operations Level:

Recognition
Isolation
Protection
Notification

Review the use of an Emergency Response Guide



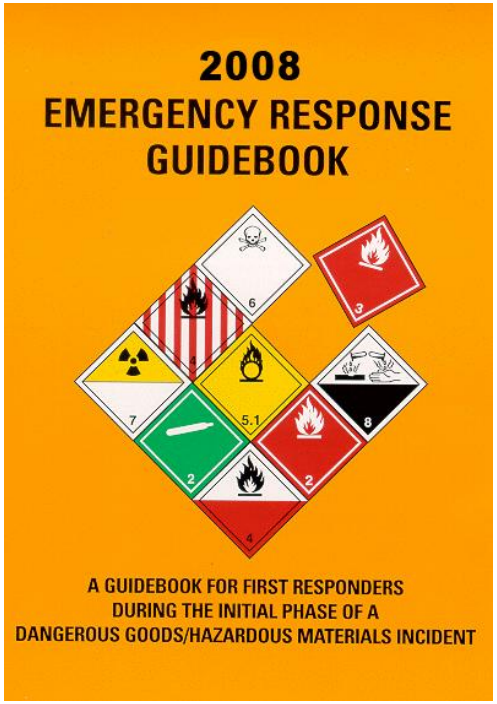
The ERG is a First Responder Tool and not something a Hazmat Technician or Specialist will be using to deal with an incident later.

Although the proper use of the ERG will make the Tech/Specialist job easier, especially if the, **initial action plan was implemented properly.**

Proper Product Identification – *is Key!*

We don't want to set a plan for product "**A**" when we are really dealing with product "**D**".

Review the use of an Emergency Response Guide

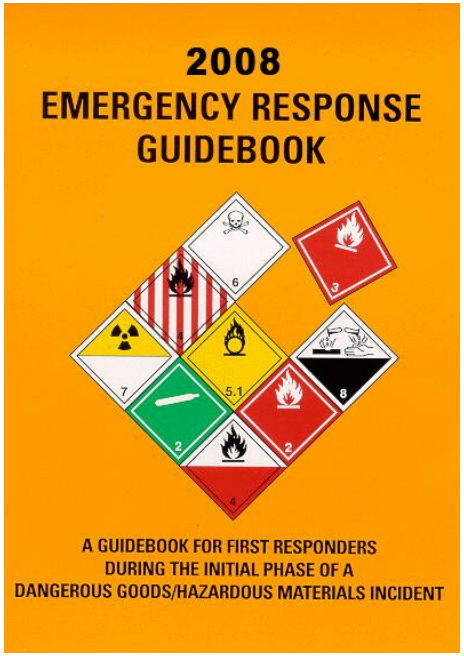


The Department's ERGs are located in the officers area of all of our initial response vehicles. – (by clipboards)

For the Chief's vehicles, they are typically located in their back command area and the data is also on their laptops.

There are also Apps for Smart Phone, I Pads & Phone: "HazRef2008" and "Wiser" are examples and they are free!

Review the use of an Emergency Response Guide



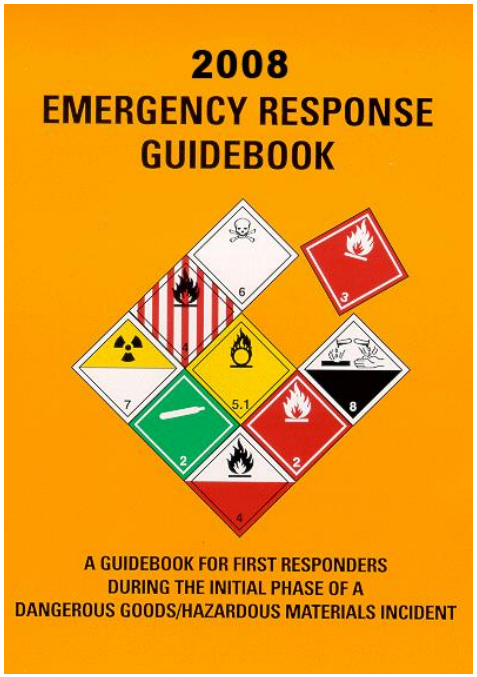
Use of an ERG should begins at the calls inception.

If the dispatched information leads us to believe there may be a dangerous material involved, the ERG should be made easily accessible and ready for use.

These incidents should be approached using caution and preferably upwind (wind at you back), *if at all possible*.

Having as much information possible – *before you arrive*, is very important.
If you're the initial Officer In Charge:
Having dispatcher call back and ask – "what is spilled and how much is there" can prove very vital information!

Review the use of an Emergency Response Guide



With Fixed Locations, (that have known Haz-Mat,)

The ERG can be used by the Chiefs in Pre Planning - Setting up a Pre Incident Action Plans for these locations.

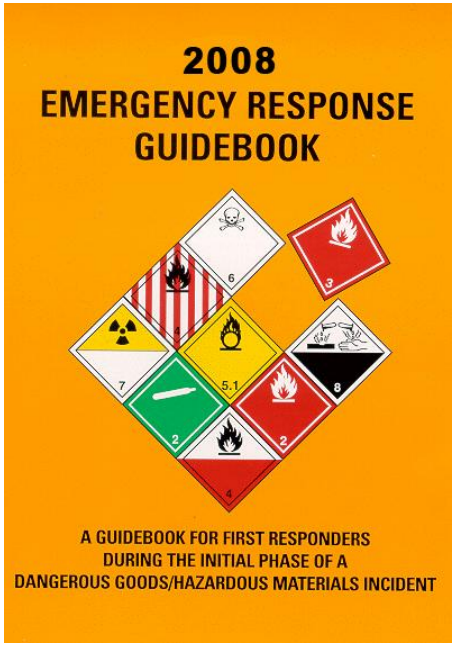
- Members could have instruction prior to ever leaving Headquarters, from the computer data sheets.

- Dispatchers should also be verbally giving this additional data to apparatus as the unit goes “21” and in route.

All members should be noting hazards we see at our everyday calls twhich may impose a Hazard to us at a later date,
(even that B.S. AFA – may save your life - later down the road)
get this info back to the dispatchers,
get into our system, so everyone learns of it at future alarm there!

Learned hazards should never remain a secret !

Review the use of an Emergency Response Guide



Remember – Proper use of the ERG
It all begins with:

Identification

We need to know **1** or more of the following:

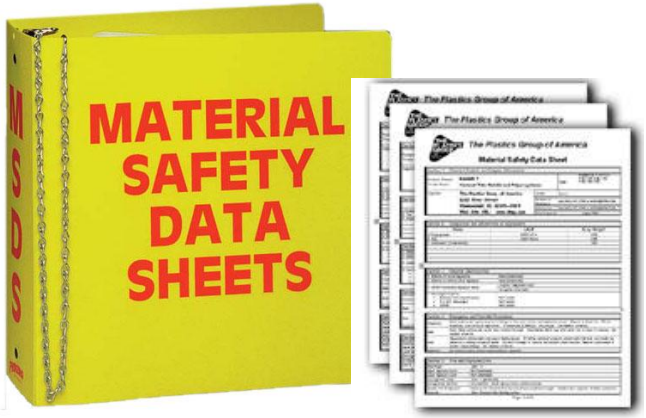
1. ***Product Name***

2. ***Products 4 digit ID Number***

3. ***Type of container it's being transported in***.

4. ***Type of Placard or Label on the container***

How do we find the Product Name ?



In most cases, the name of the product can be found by locating the person who made the call for assistance.

You are most likely being called to the premise because they spilled the product and they know what it is?

All premises that have a hazardous material on site should have Material Safety Data Sheets (aka: **MSDS**) for **each** product,
As per "**A Right to Know Act**"

The MSDS will explain **everything** about the product: Name, contact info for its maker, physical and chemical characteristics, hazards, exposures, first aid procedures….

MATERIAL SAFETY DATA SHEET -

MATERIAL SAFETY DATA SHEET

Issued: August 6, 1992
REVISED: February 2, 2010

SECTION 1: PRODUCT INFORMATION

Product Name: **RAIN - SHIELD CLEAR MB**
Manufacturer: GEMITE PRODUCTS INC.
Address: 1787 Drew Road, Mississauga, ON L5S 1J5
Emergency Phone: US: 888-443-6483 CANADA: 905-672-2020
Chemical Family: Acrylic Emulsion Based Water Borne
T.D.G. Classification:

SECTION 2: HAZARDOUS INGREDIENTS

INGREDIENTS	%	TLV	CAS NO.
Ethylene Glycol	3.5		107 – 21 –5
Ester Alcohol	1.1		25265 – 77 –4

SECTION 3: PHYSICAL DATA

Physical State: Aqueous Paint
Odour & Appearance: Odourless, Water borne thin solution
Vapour Pressure: Unknown
Vapour Density:
Evaporation Rate:
Boiling Point: 100 ℃
Specific Gravity: 1.1
PH: 9 - 10

SECTION 4 : FIRE & EXPLOSION DATA

Flammability: Nonflammable
Extinguishing Media: N/A
Special Procedures: N/A
Flash Point: N/A
Auto Ignition Temp: N/A
Upper Flammability Limit: N/A
Lower Flammability Limit: N/A
Hazardous Combustion Products: N/A
Explosion Data: No fire or explosion hazards

SECTION 5: REACTIVITY DATA

Conditions Contributing to Instability: Stable
Incompatibility: Very Compatible
Hazardous Polymerization: Will not occur
Reactivity Conditions: None
Hazardous Products of Decomposition: Decomposition products of acrylic polymers

SECTION 6: TOXICOLOGICAL PROPERTIES

Route of Entry: Eyes, Mouth, Skin
Skin Contact: Reddening of skin upon repeated or prolonged contact
Eye Contact: Slight irritation to eyes with direct contact
Inhalation: Over exposure from spray mist may irritate upper respiratory tract
Ingestion: N/A
Effects of Chronic Exposure: N/A
Effects of Acute Exposure: N/A
TLV: N/A

SECTION 7: PREVENTATIVE MEASURES

Protective Equipment
- **Gloves Type**: Impervious gloves
- **Respiratory Type**: Respiratory protection is required when sanding or grinding the finished product
- **Eye Type**: Safety glasses when spraying
- **Footwear Type**: N/A
- **Clothing Type**: N/A

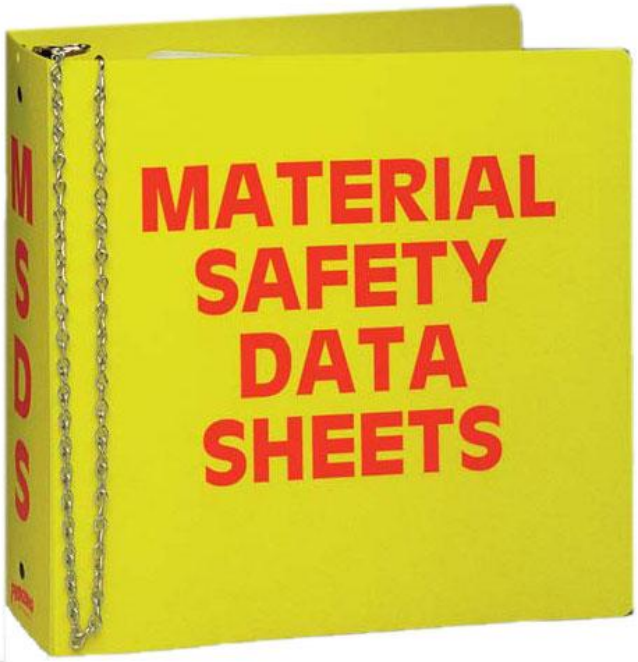
Engineering Controls: N/A
Leak/ Spill: Wash down with water
Waste Disposal: Same as paint.
Handling Procedures & Equipment: Avoid skin and eye contact.
Storage Needs: Keep container closed when not in use.

SECTION 8: FIRST AID MEASURES

Eye Contact: Irrigate with large amounts of water for at least 15 minutes. Seek medical attention if irritation persists.
Skin Contact: Wash exposed areas with clean, fresh water and soap.
Inhalation: Move person to fresh air and seek medical attention.
Ingestion: Unless unconscious or convulsing, dilute material with water or milk. Do not induce vomiting. Consult physician.

N/A : Not applicable

MATERIAL SAFETY DATA SHEET -



MSDS sheets are required to be located in common areas, since every person on premise must have access to them - Typically found in break rooms …

The best way to immediately obtain the MSDS sheets at an incident is to have the person in charge of location have someone get them for you, *if conditions allow*.

For Product being Transported – **Non-Fixed Locations look for the "Shipping Papers"**

Roadway – within Arms Length of the Driver,
Bill of Lading (usually in the drivers door pocket)

Rail – on the Conductor Person,
Consist

Waterway – in the wheel house,
Dangerous Cargo Manifest

Airplane – in the Cockpit,
Air Bill

These all list the Cargo being Carried by the transportation vessel, they are similar to the MSDS sheets and will the have specific data on each of the products being carried – ***required by law!***

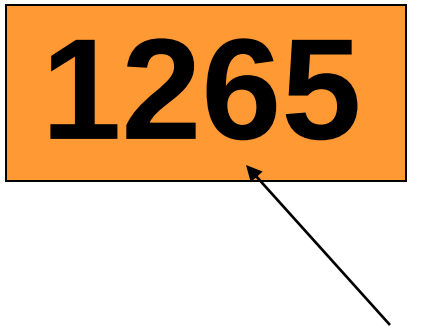
How do we find the Product's ID Number ?

Product ID number can be found **on** the "containers" - **by a label or placard.**

This Products ID is 1075

How do we find the Product's ID Number ?

For Products that originated overseas, you may see a Orange rectangle with 4 black numbers



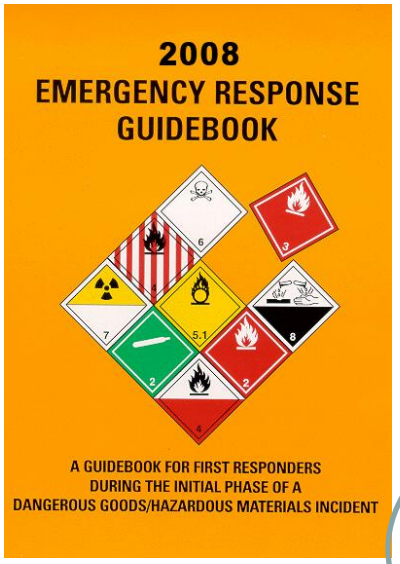
This Products ID is 1265

Identifying Product Containers

When we talk about identifying the product by it's containers, we are talking about, while it's being transported.

For products being transported,
they may be on fire or leaking and we can't get to the "shipping papers", this is when Container ID becomes important.

Identifying Products Containers / Containers of Transportation



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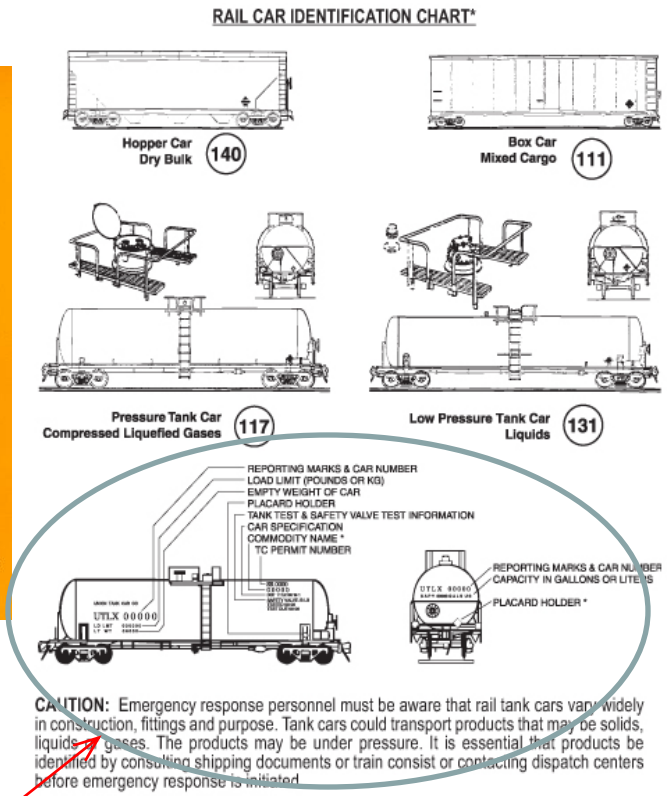
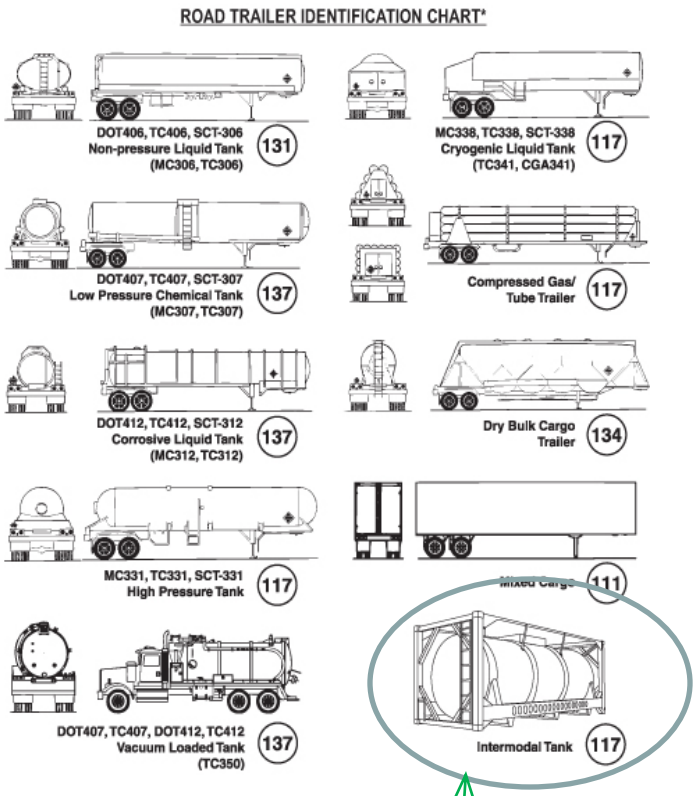




Also Helps ID Train tank car Markings

Shipping Cargo Tanks from a Ship to a Back of aTruck (added to book in 2008)

All can be found on page 18 & 19 of ERG

Review the use of an Emergency Response Guide

Identifying Products Containers / Containers of Transportation

All these are common means of transporting a hazardous material from place to place.

But remember most hazard calls will occurs **not** while the product is being **transported**, but when the product is being **Loaded or Off Loaded form the container.**

Identifying Placards By - Class of Hazardous Material

Class 1 - Explosives
Division 1.1 Explosives with a mass explosion hazard
Division 1.2 Explosives with a projection hazard
Division 1.3 Explosives with predominantly a fire hazard
Division 1.4 Explosives with no significant blast hazard
Division 1.5 Very insensitive explosives; blasting agents
Division 1.6 Extremely insensitive detonating articles

Class 2 - Gases
Division 2.1 Flammable gases
Division 2.2 Non-flammable, non-toxic* compressed gases
Division 2.3 Gases toxic* by inhalation
Division 2.4 Corrosive gases (Canada)

Class 3 - Flammable liquids/ combustible liquids

Class 4 - Flammable solids; Spontaneously combustible materials; and Dangerous when wet materials
Division 4.1 Flammable solids
Division 4.2 Spontaneously combustible materials
Division 4.3 Dangerous when wet materials

Class 5 - Oxidizers and Organic peroxides
Division 5.1 Oxidizers
Division 5.2 Organic peroxides

Class 6 - Toxic* materials and Infectious substances
Division 6.1 Toxic* materials
Division 6.2 Infectious substances

Class 7 - Radioactive materials

Class 8 - Corrosive materials

Class 9 - Miscellaneous dangerous goods

Identifying Placards/Labels

Placards/Labels are the warning label affixed to the products container.

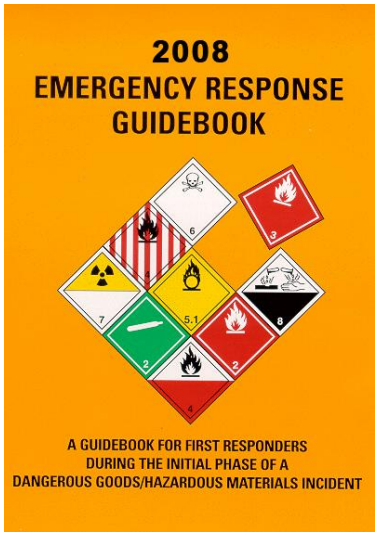
Class 3 - Flammable liquid

Class 2 - Gas

Class 4 - Flammable solid

Review the use of an Emergency Response Guide

Identifying Placards



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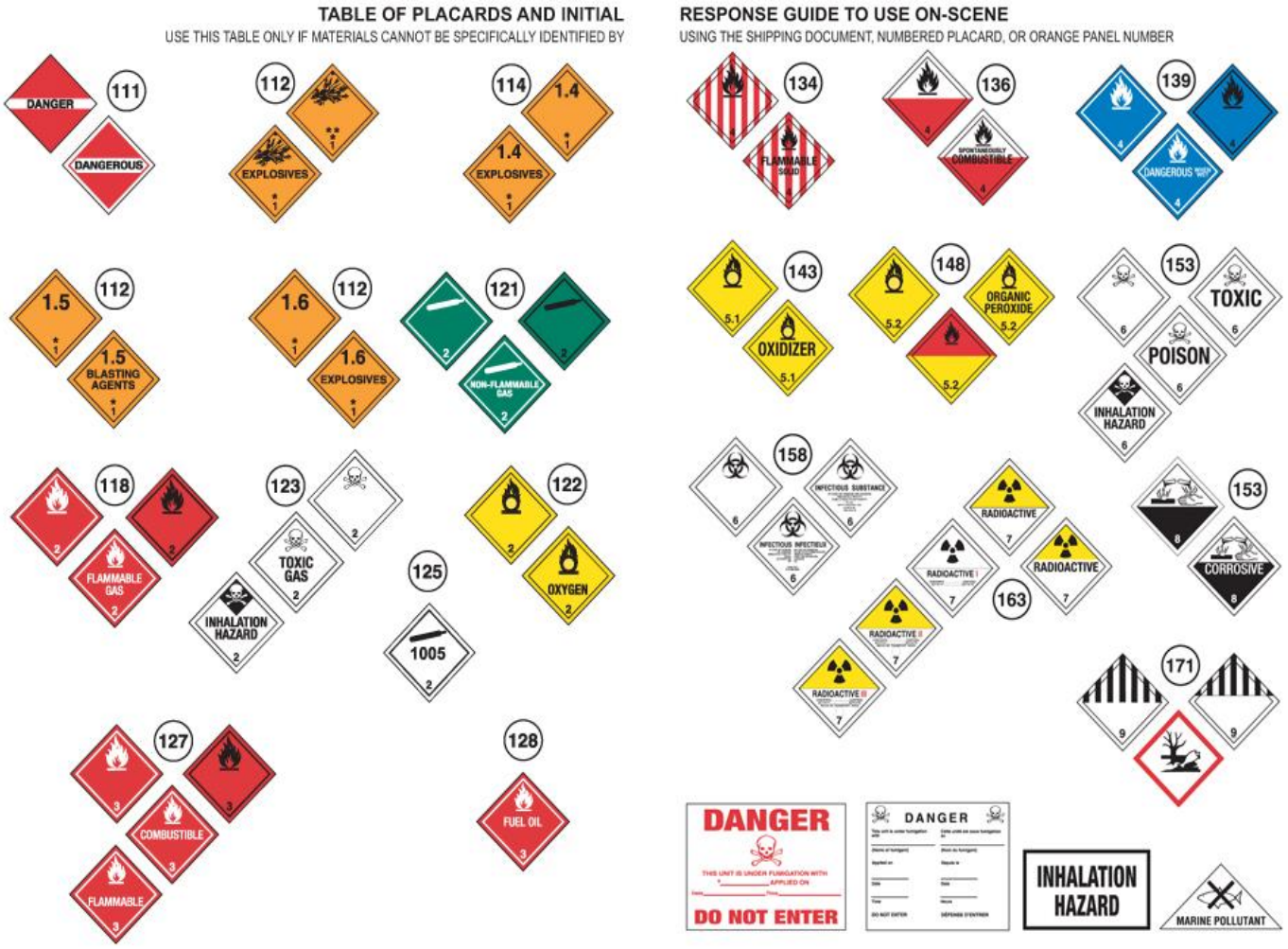


All can be found on page 16 & 17 of ERG

Review the use of an Emergency Response Guide

Identifying Placards/Labels

When you have a placard that displays an ID Number **and** the Class,
Reference the ID in the guide (*Not the Placard)*,

- It will be more specific to the product
- Will give us the actual product name
- More specific instructions to mitigate

NFPA 704 Style Placards

As you enter a structure, outside gates to property, you may see a NFPA 704 Placard:

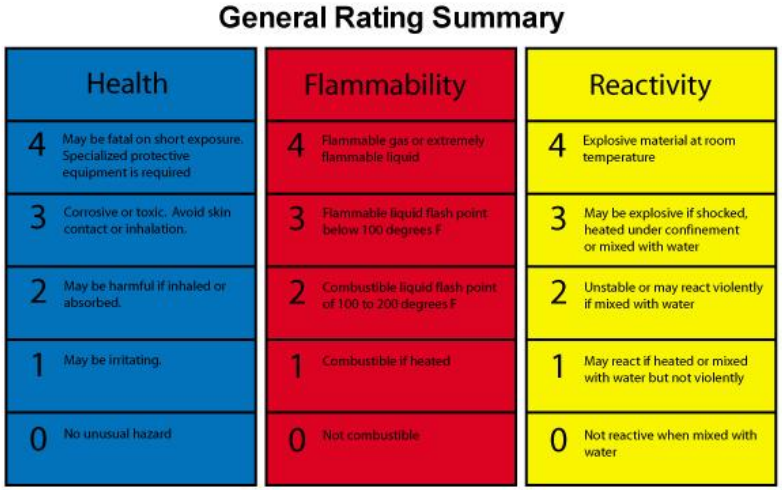
RED – FLAMMABILITY

BLUE – HEALTH

YELLOW – REACTIVITY

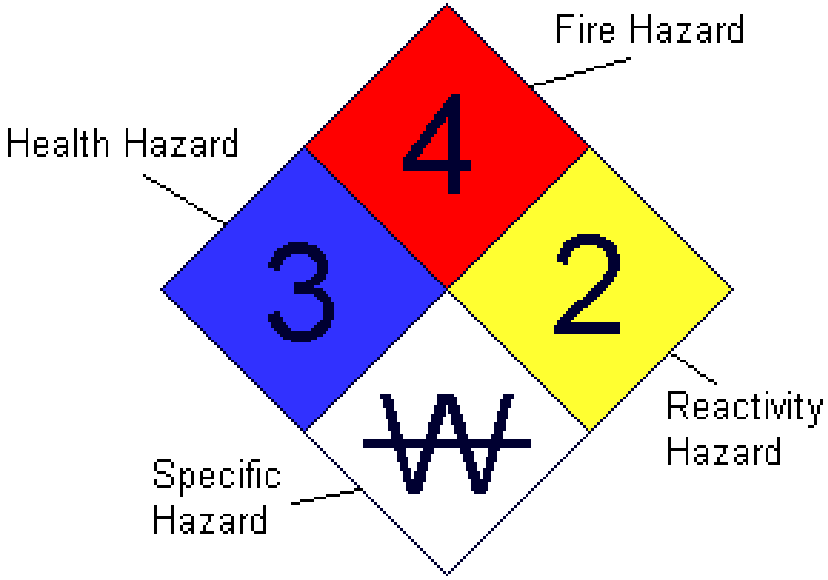
WHITE – SPECIAL HAZARD

NFPA 704 Style Placards



NFPA 704 Style Placards

Rates on a scale of 0-4,
4 being most dangerous



RED – FLAMMABILITY – **4**
(How Flammable is it) Flash < 73 degree F

BLUE – HEALTH – **3**
(How it will effect your Health) Extreme danger

YELLOW – REACTIVITY – **2**
(how well does it play) chemical change is violent

WHITE – SPECIAL HAZARD – W with line through it
(*reacts with water*)

NFPA 704 Style Placards

What does this mean?

RED – Flammability – 3
Flash below 100 degree F

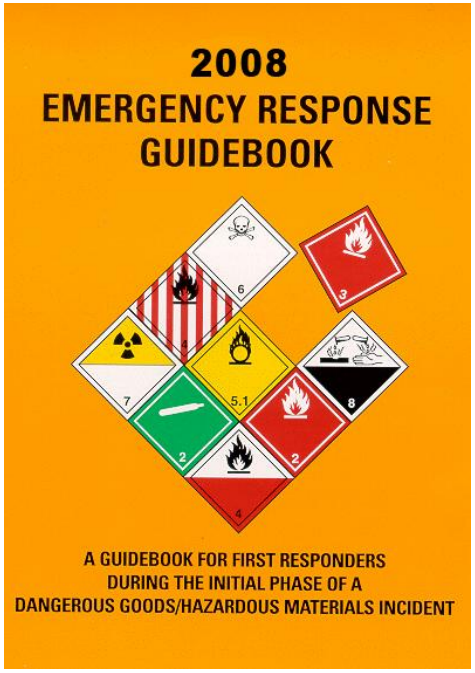
BLUE – Health Hazard – 2
hazardous

YELLOW – Reactivity – 1
Unstable if heated

The W with the line represent
it reacts to water, so should we use water?

Our 1 danger will be the 3 – Fire below 100 degrees
but do we use water to keep temp down? NO

NFPA 704 Style Placards



Can we reference this to the ERG?

Have we **accomplished** meeting 1 of our objectives?

- **Name**,
- **Number**,
- **Placard listing the class** of Hazardous Material

or

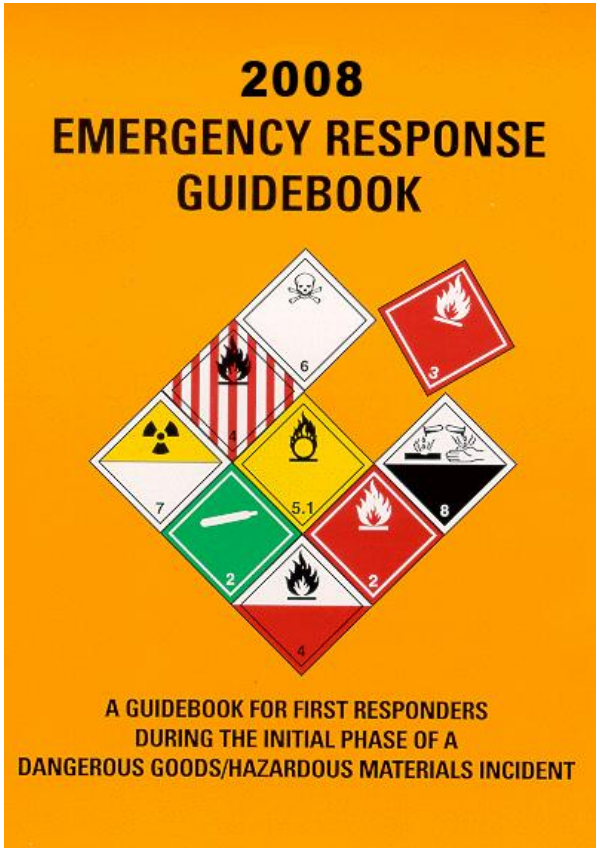
- **Container Identification**.

- **NO - so we Can't reference to guide!**

Think of these NFPA 704 Placards as your warning label to what to come.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



Once we've learned:

*1. The Products Name
*2. The Products 4 digit ID #
3. The Type of Container it's being Transported in
   Or
4. The Placard that is on the products container

Remember WHAT WE DO NEXT ?

- Remember the Name or ID are best choices since they will give us a more precise action plan.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

When we looking at the ERG from the side we notice:

It is Divided into 4 Sections

Yellow
Blue
Orange
Green

The White pages are instructional pages to the guides use.

Review of use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

Yellow-bordered pages:
Index list of dangerous goods in numerical order by ID number.

This section of the guide will be consulted if you had the Products ID Number of the material involved.

This list displays the 4-digit ID number of the material followed by its assigned emergency response guide and the full material name.

Say we had and ID # of **1090**

Review the use of an Emergency Response Guide

ID No.	Guide No.	Name of Material
1030	115	1,1-Difluoroethane
1030	115	Difluoroethane
1030	115	Refrigerant gas R-152a
1032	118	Dimethylamine, anhydrous
1033	115	Dimethyl ether
1035	115	Ethane
1035	115	Ethane, compressed
1036	118	Ethylamine
1037	115	Ethyl chloride
1038	115	Ethylene, refrigerated liquid (cryogenic liquid)
1039	115	Ethyl methyl ether
1039	115	Methyl ethyl ether
1040	119P	Ethylene oxide
1040	119P	Ethylene oxide with Nitrogen
1041	115	Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide
1041	115	Carbon dioxide and Ethylene oxide mixtures, with more than 6% Ethylene oxide
1041	115	Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide
1041	115	Ethylene oxide and Carbon dioxide mixtures, with more than 6 % Ethylene oxide
1043	125	Fertilizer, ammoniating solution, with free Ammonia
1044	126	Fire extinguishers with compressed gas
1044	126	Fire extinguishers with liquefied gas
1045	124	Fluorine
1045	124	Fluorine, compressed

ID No.	Guide No.	Name of Material
1046	121	Helium
1046	121	Helium, compressed
1048	125	Hydrogen bromide, anhydrous
1049	115	Hydrogen
1049	115	Hydrogen, compressed
1050	125	Hydrogen chloride, anhydrous
1051	117	AC
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide
1051	117	Hydrogen cyanide, anhydrous, stabilized
1051	117	Hydrogen cyanide, stabilized
1052	125	Hydrogen fluoride, anhydrous
1053	117	Hydrogen sulfide
1053	117	Hydrogen sulphide
1055	115	Isobutylene
1056	121	Krypton
1056	121	Krypton, compressed
1057	115	Lighter refills (cigarettes) (flammable gas)
1057	115	Lighters (cigarettes) (flammable gas)
1058	120	Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air
1060	116P	Methylacetylene and Propadiene mixture, stabilized
1060	116P	Propadiene and Methylacetylene mixture, stabilized
1061	118	Methylamine, anhydrous
1062	123	Methyl bromide
1063	115	Methyl chloride

ID No.	Guide No.	Name of Material
1063	115	Refrigerant gas R-40
1064	117	Methyl mercaptan
1065	121	Neon
1065	121	Neon, compressed
1066	121	Nitrogen
1066	121	Nitrogen, compressed
1067	124	Dinitrogen tetroxide
1067	124	Nitrogen dioxide
1069	125	Nitrosyl chloride
1070	122	Nitrous oxide
1070	122	Nitrous oxide, compressed
1071	119	Oil gas
1071	119	Oil gas, compressed
1072	122	Oxygen
1072	122	Oxygen, compressed
1073	122	Oxygen, refrigerated liquid (cryogenic liquid)
1075	115	Butane
1075	115	Butane mixture
1075	115	Butylene
1075	115	Isobutane
1075	115	Isobutane mixture
1075	115	Isobutylene
1075	115	Liquefied petroleum gas
1075	115	LPG
1075	115	Petroleum gases, liquefied
1075	115	Propane
1075	115	Propane mixture
1075	115	Propylene
1076	125	CG
1076	125	Diphosgene
1076	125	DP
1076	125	Phosgene

ID No.	Guide No.	Name of Material
1077	115	Propylene
1078	126	Dispersant gas, n.o.s.
1078	126	Refrigerant gas, n.o.s.
1079	125	Sulfur dioxide
1079	125	Sulphur dioxide
1080	126	Sulfur hexafluoride
1080	126	Sulphur hexafluoride
1081	116P	Tetrafluoroethylene, stabilized
1082	119P	Trifluorochloroethylene, stabilized
1083	118	Trimethylamine, anhydrous
1085	116P	Vinyl bromide, stabilized
1086	116P	Vinyl chloride, stabilized
1087	116P	Vinyl methyl ether, stabilized
1088	127	Acetal
1089	129	Acetaldehyde
1090	127	Acetone
1091	127	Acetone oils
1092	131P	Acrolein, stabilized
1093	131P	Acrylonitrile, stabilized
1098	131	Allyl alcohol
1099	131	Allyl bromide
1100	131	Allyl chloride
1104	129	Amyl acetates
1105	129	Amyl alcohols
1105	129	Pentanols
1106	132	Amylamines
1107	129	Amyl chloride
1108	128	n-Amylene
1108	128	1-Pentene
1109	129	Amyl formates
1110	127	n-Amyl methyl ketone
1110	127	Amyl methyl ketone

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Page 29

For example:

ID No.	Guide No.	Name of Material
1090	127	Acetone

Review the use of an Emergency Response Guide

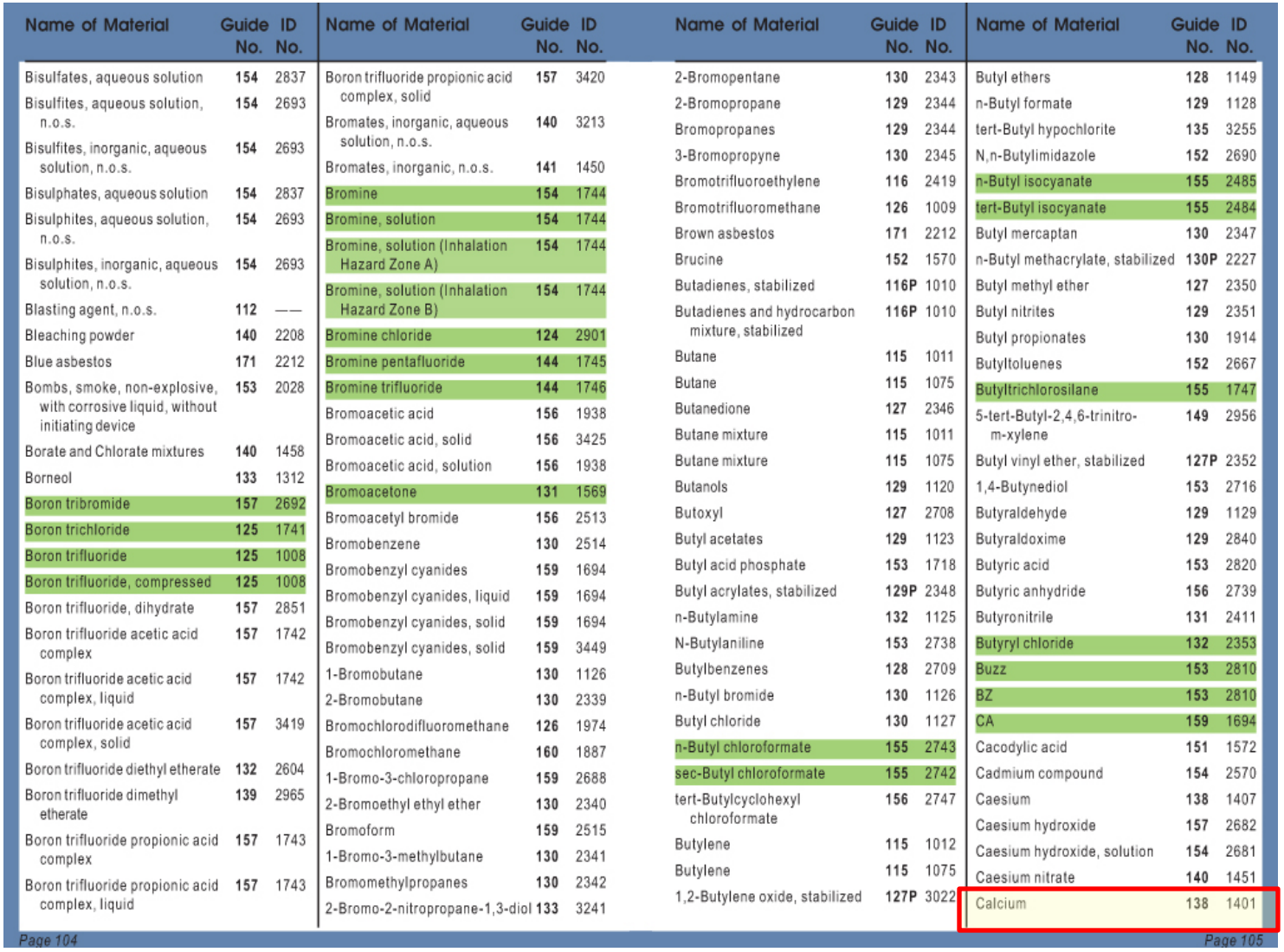
Putting what we now know to use, utilizing the ERG

Blue-bordered pages:
List of dangerous goods in alphabetical order by the **material's name**.

This section of the guide would be consulted by the name of the material involved. This list displays the name of the material followed by its assigned emergency response guide and 4-digit ID number.

What if we had a product name of **Calcium**?

HOW TO USE AN EMERGENCY RESPONSE GUIDEBOOK



Name of Material	Guide No.	ID No.
Bisulfates, aqueous solution	154	2837
Bisulfites, aqueous solution, n.o.s.	154	2693
Bisulfites, inorganic, aqueous solution, n.o.s.	154	2693
Bisulphates, aqueous solution	154	2837
Bisulphites, aqueous solution, n.o.s.	154	2693
Bisulphites, inorganic, aqueous solution, n.o.s.	154	2693
Blasting agent, n.o.s.	112	——
Bleaching powder	140	2208
Blue asbestos	171	2212
Bombs, smoke, non-explosive, with corrosive liquid, without initiating device	153	2028
Borate and Chlorate mixtures	140	1458
Borneol	133	1312
Boron tribromide	157	2692
Boron trichloride	125	1741
Boron trifluoride	125	1008
Boron trifluoride, compressed	125	1008
Boron trifluoride, dihydrate	157	2851
Boron trifluoride acetic acid complex	157	1742
Boron trifluoride acetic acid complex, liquid	157	1742
Boron trifluoride acetic acid complex, solid	157	3419
Boron trifluoride diethyl etherate	132	2604
Boron trifluoride dimethyl etherate	139	2965
Boron trifluoride propionic acid complex	157	1743
Boron trifluoride propionic acid complex, liquid	157	1743
Boron trifluoride propionic acid complex, solid	157	3420
Bromates, inorganic, aqueous solution, n.o.s.	140	3213
Bromates, inorganic, n.o.s.	141	1450
Bromine	154	1744
Bromine, solution	154	1744
Bromine, solution (Inhalation Hazard Zone A)	154	1744
Bromine, solution (Inhalation Hazard Zone B)	154	1744
Bromine chloride	124	2901
Bromine pentafluoride	144	1745
Bromine trifluoride	144	1746
Bromoacetic acid	156	1938
Bromoacetic acid, solid	156	3425
Bromoacetic acid, solution	156	1938
Bromoacetone	131	1569
Bromoacetyl bromide	156	2513
Bromobenzene	130	2514
Bromobenzyl cyanides	159	1694
Bromobenzyl cyanides, liquid	159	1694
Bromobenzyl cyanides, solid	159	1694
Bromobenzyl cyanides, solid	159	3449
1-Bromobutane	130	1126
2-Bromobutane	130	2339
Bromochlorodifluoromethane	126	1974
Bromochloromethane	160	1887
1-Bromo-3-chloropropane	159	2688
2-Bromoethyl ethyl ether	130	2340
Bromoform	159	2515
1-Bromo-3-methylbutane	130	2341
Bromomethylpropanes	130	2342
2-Bromo-2-nitropropane-1,3-diol	133	3241
2-Bromopentane	130	2343
2-Bromopropane	129	2344
Bromopropanes	129	2344
3-Bromopropyne	130	2345
Bromotrifluoroethylene	116	2419
Bromotrifluoromethane	126	1009
Brown asbestos	171	2212
Brucine	152	1570
Butadienes, stabilized	116P	1010
Butadienes and hydrocarbon mixture, stabilized	116P	1010
Butane	115	1011
Butane	115	1075
Butanedione	127	2346
Butane mixture	115	1011
Butane mixture	115	1075
Butanols	129	1120
Butoxyl	127	2708
Butyl acetates	129	1123
Butyl acid phosphate	153	1718
Butyl acrylates, stabilized	129P	2348
n-Butylamine	132	1125
N-Butylaniline	153	2738
Butylbenzenes	128	2709
n-Butyl bromide	130	1126
Butyl chloride	130	1127
n-Butyl chloroformate	155	2743
sec-Butyl chloroformate	155	2742
tert-Butylcyclohexyl chloroformate	156	2747
Butylene	115	1012
Butylene	115	1075
1,2-Butylene oxide, stabilized	127P	3022
Butyl ethers	128	1149
n-Butyl formate	129	1128
tert-Butyl hypochlorite	135	3255
N,n-Butylimidazole	152	2690
n-Butyl isocyanate	155	2485
tert-Butyl isocyanate	155	2484
Butyl mercaptan	130	2347
n-Butyl methacrylate, stabilized	130P	2227
Butyl methyl ether	127	2350
Butyl nitrites	129	2351
Butyl propionates	130	1914
Butyltoluenes	152	2667
Butyltrichlorosilane	155	1747
5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956
Butyl vinyl ether, stabilized	127P	2352
1,4-Butynediol	153	2716
Butyraldehyde	129	1129
Butyraldoxime	129	2840
Butyric acid	153	2820
Butyric anhydride	156	2739
Butyronitrile	131	2411
Butyryl chloride	132	2353
Buzz	153	2810
BZ	153	2810
CA	159	1694
Cacodylic acid	151	1572
Cadmium compound	154	2570
Caesium	138	1407
Caesium hydroxide	157	2682
Caesium hydroxide, solution	154	2681
Caesium nitrate	140	1451
Calcium	138	1401

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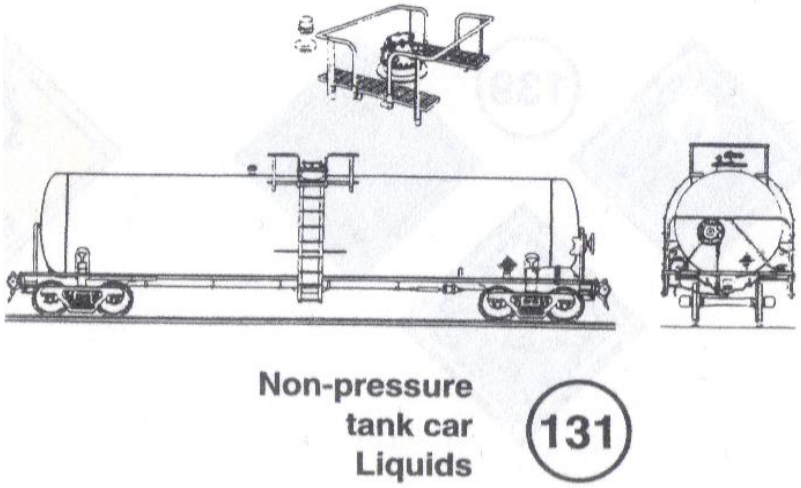
For example:

Name of Material	**Guide No.**	**ID No.**
Calcium	138	1401

Review of use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

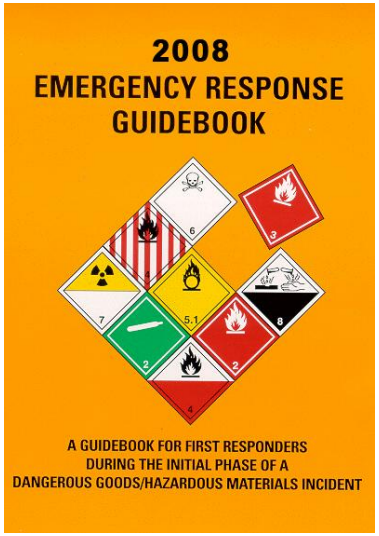


Knowing this is the container that is leaking,
What guide will we be using to handle the incident?

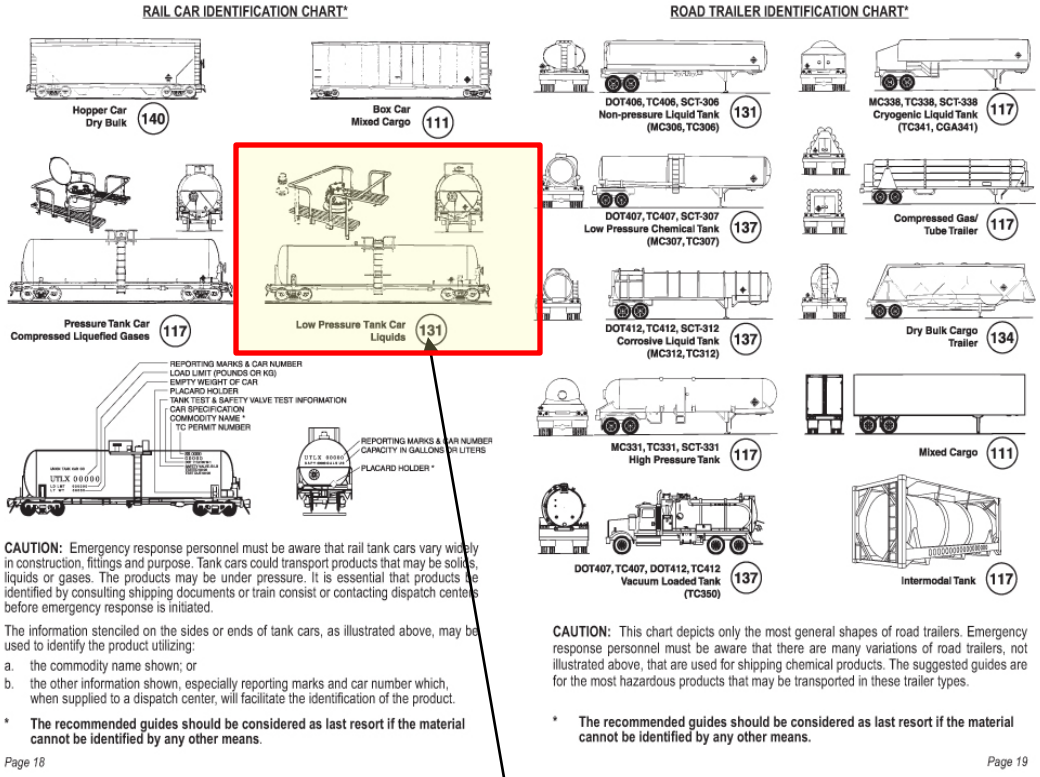
Is this a high gas or low pressure liquid car,
Remember how can we quickly tell difference?

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



Page 18 & 19



From Container ID

We'll use Reference Guide Number 131

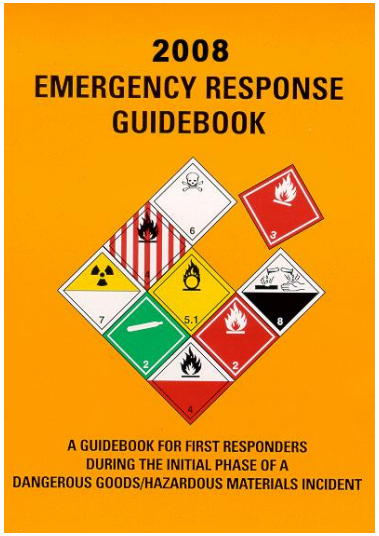
Review of use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

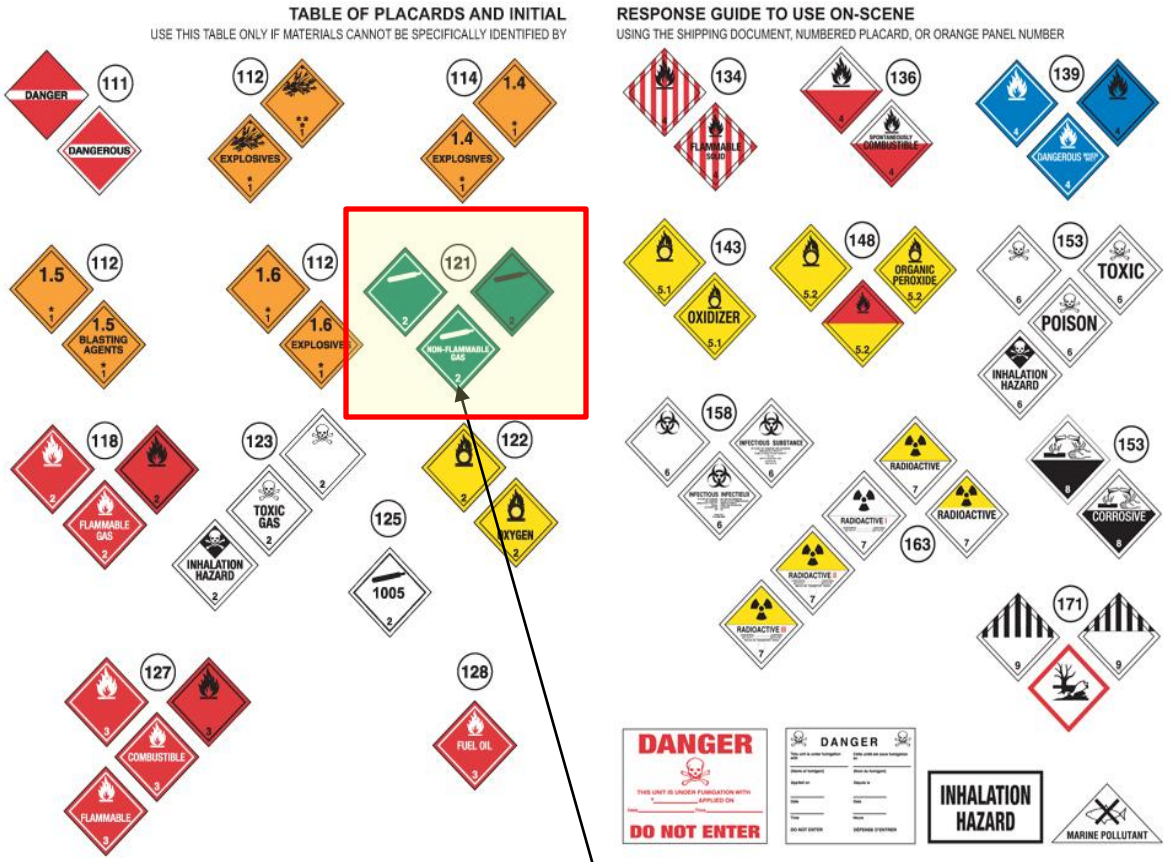
Knowing the container has this label,
What guide will we be using to handle the incident?

Review of use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



Page 16 & 17



From Placard Reference

We'll use Reference Guide Number 121

Review of use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

Our Main Objective is to get to the **Orange Sections** of the Guide.

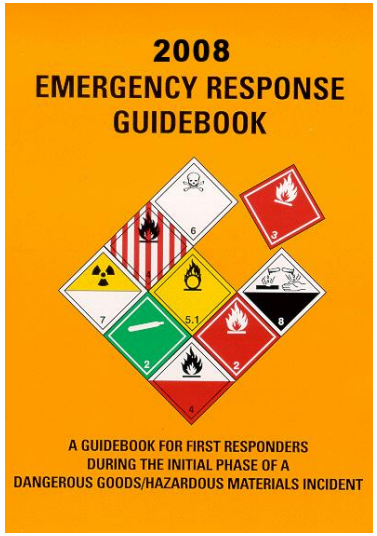
Orange-bordered pages:
This section is the most important section of the guidebook because it is where all the safety recommendations are provided.

It comprises a total of 62 individual guides, presented in a two-page format. Each guide provides safety recommendations and emergency response information, to protect responders and the public.

The left hand page provides safety related information whereas the right hand page provides emergency response guidance and activities for fire situations, spill or leak incidents and first aid.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



SO:

If we have:

What color in the Guide would we reference that?

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

If we have an ID number of 1203

What color in the Guide would we reference that?

YELLOW

ID No:	Guide No.	Name of Material
1203	**128**	Gasoline

We'll only use the class 3 placard if didn't have ID#

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

If we have:

What color in the Guide would we reference that?

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

If we havw a Chemical Name: Sulfuric acid

What color in the Guide would we reference that?

BLUE

Name of Material:	Guide No.	ID No.
Sulfuric Acid	**137**	1830

We'll only use the Danger placard if didn't have the name

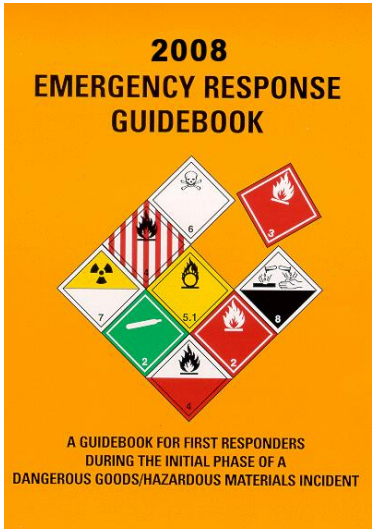
Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

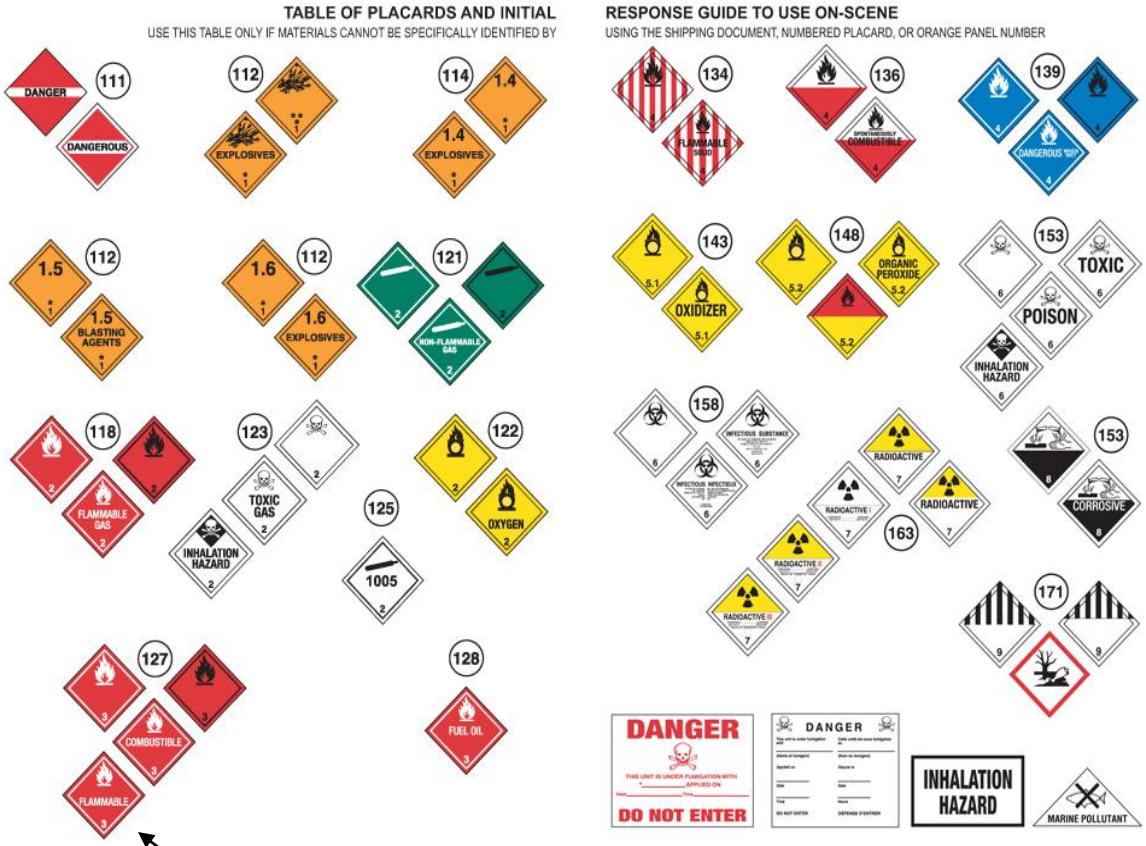
This placard is on a container that is leaking

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



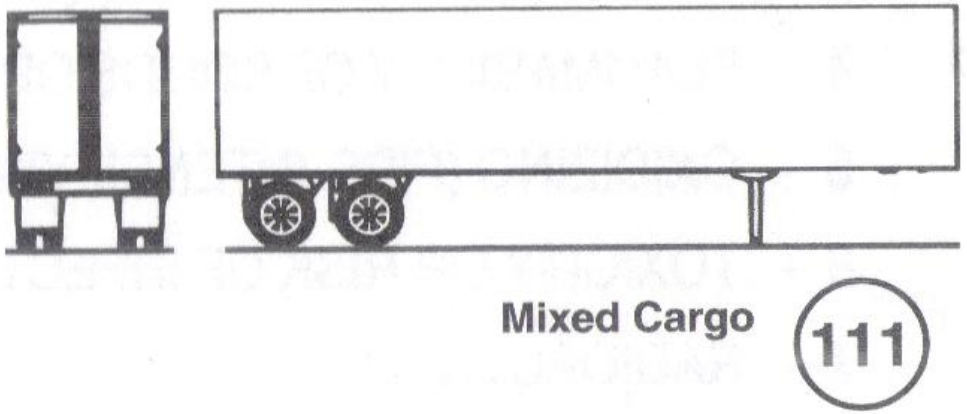
Page 16 & 17



Guide 127

Review of use of an Emergency Response Guide

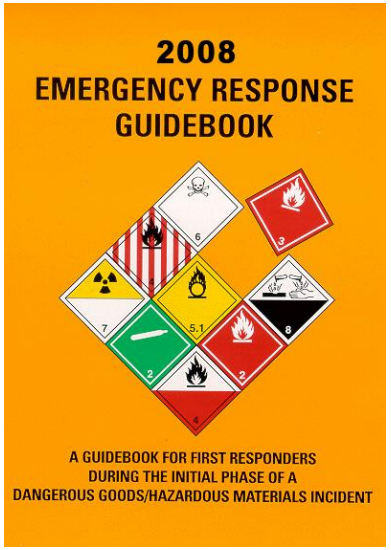
Putting what we now know to use, utilizing the ERG



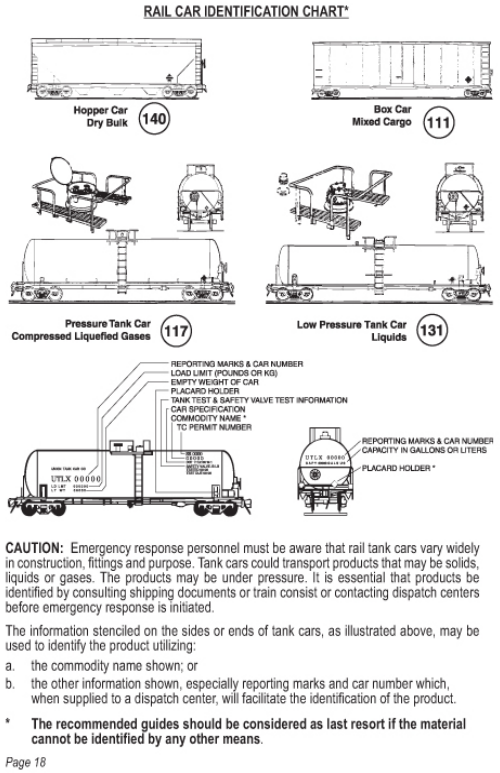
You have something leaking from a container that looks like this, Which Guide will we use?

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



Page 18 & 19



RAIL CAR IDENTIFICATION CHART*

Hopper Car Dry Bulk (140)

Box Car Mixed Cargo (111)

Pressure Tank Car Compressed Liquefied Gases (117)

Low Pressure Tank Car Liquids (131)

REPORTING MARKS & CAR NUMBER
LOAD LIMIT (POUNDS OR KG)
EMPTY WEIGHT OF CAR
PLACARD HOLDER
TANK TEST & SAFETY VALVE TEST INFORMATION
CAR SPECIFICATION
COMMODITY NAME *
TC PERMIT NUMBER

REPORTING MARKS & CAR NUMBER
CAPACITY IN GALLONS OR LITERS
PLACARD HOLDER *

CAUTION: Emergency response personnel must be aware that rail tank cars vary widely in construction, fittings and purpose. Tank cars could transport products that may be solids, liquids or gases. The products may be under pressure. It is essential that products be identified by consulting shipping documents or train consist or contacting dispatch centers before emergency response is initiated.

The information stenciled on the sides or ends of tank cars, as illustrated above, may be used to identify the product utilizing:

a. the commodity name shown; or
b. the other information shown, especially reporting marks and car number which, when supplied to a dispatch center, will facilitate the identification of the product.

* **The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

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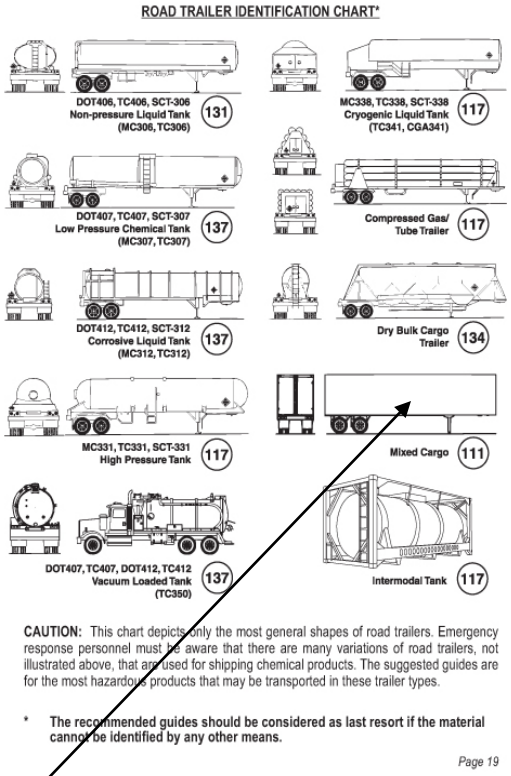

ROAD TRAILER IDENTIFICATION CHART*

DOT406, TC406, SCT-306 Non-pressure Liquid Tank (MC306, TC306) (131)

MC338, TC338, SCT-338 Cryogenic Liquid Tank (TC341, CGA341) (117)

DOT407, TC407, SCT-307 Low Pressure Chemical Tank (MC307, TC307) (137)

Compressed Gas/ Tube Trailer (117)

DOT412, TC412, SCT-312 Corrosive Liquid Tank (MC312, TC312) (137)

Dry Bulk Cargo Trailer (134)

MC331, TC331, SCT-331 High Pressure Tank (117)

Mixed Cargo (111)

DOT407, TC407, DOT412, TC412 Vacuum Loaded Tank (TC350) (137)

Intermodal Tank (117)

CAUTION: This chart depicts only the most general shapes of road trailers. Emergency response personnel must be aware that there are many variations of road trailers, not illustrated above, that are used for shipping chemical products. The suggested guides are for the most hazardous products that may be transported in these trailer types.

* **The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

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Guide 111

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

Guide 111

Guide 111 is probably the most used since it references **all unknowns and mixed items**.

This is why it's the 1st pages in the Orange Section.

Review the use of an Emergency Response Guide

Using the Guide to handle an incident

What does the Orange Pages in the Guide tell us?

Guide 111

GUIDE 111 MIXED LOAD/UNIDENTIFIED CARGO ERG2004

POTENTIAL HAZARDS

FIRE OR EXPLOSION
- May explode from heat, shock, friction or contamination.
- May react violently or explosively on contact with air, water or foam.
- May be ignited by heat, sparks or flames.
- Vapors may travel to source of ignition and flash back.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH
- Inhalation, ingestion or contact with substance may cause severe injury, infection, disease or death.
- High concentration of gas may cause asphyxiation without warning.
- Contact may cause burns to skin and eyes.
- Fire or contact with water may produce irritating, toxic and/or corrosive gases.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.

PROTECTIVE CLOTHING
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations.

EVACUATION

Fire
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

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ERG2004 MIXED LOAD/UNIDENTIFIED CARGO GUIDE 111

EMERGENCY RESPONSE

FIRE

CAUTION: Material may react with extinguishing agent.

Small Fires
- Dry chemical, CO_2, water spray or regular foam.

Large Fires
- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks
- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK
- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spills • Take up with sand or other non-combustible absorbent material and place into containers for later disposal.

Large Spills • Dike far ahead of liquid spill for later disposal.

FIRST AID
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Shower and wash with soap and water.
- Keep victim warm and quiet.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

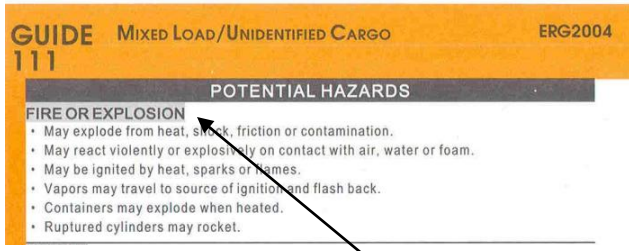
Page 171

Review of use of an Emergency Response Guide

Using the Guide to handle an incident

What does the Orange Pages in the Guide tell us?

Guide 111


GUIDE 111 MIXED LOAD/UNIDENTIFIED CARGO ERG2004

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from heat, shock, friction or contamination.
- May react violently or explosively on contact with air, water or foam.
- May be ignited by heat, sparks or flames.
- Vapors may travel to source of ignition and flash back.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

POTENTIAL HAZARDS – Fire or Explosion

Due to the fact - the product is **unknown** or **multiple products** mixed could make an even more dangerous or unstable product.

The Fire or Explosion potential needs to be dealt with first.

Once we know it's secure, then what?

Review of use of an Emergency Response Guide

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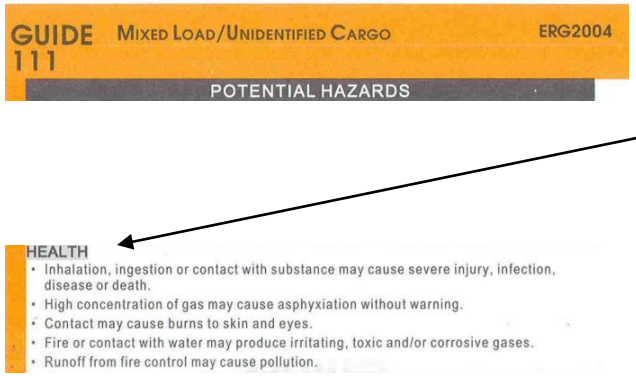

GUIDE 111 MIXED LOAD/UNIDENTIFIED CARGO ERG2004

POTENTIAL HAZARDS

HEALTH

- Inhalation, ingestion or contact with substance may cause severe injury, infection, disease or death.
- High concentration of gas may cause asphyxiation without warning.
- Contact may cause burns to skin and eyes.
- Fire or contact with water may produce irritating, toxic and/or corrosive gases.
- Runoff from fire control may cause pollution.

POTENTIAL HAZARDS – HEALTH

Our next Priority is to address Health Hazard

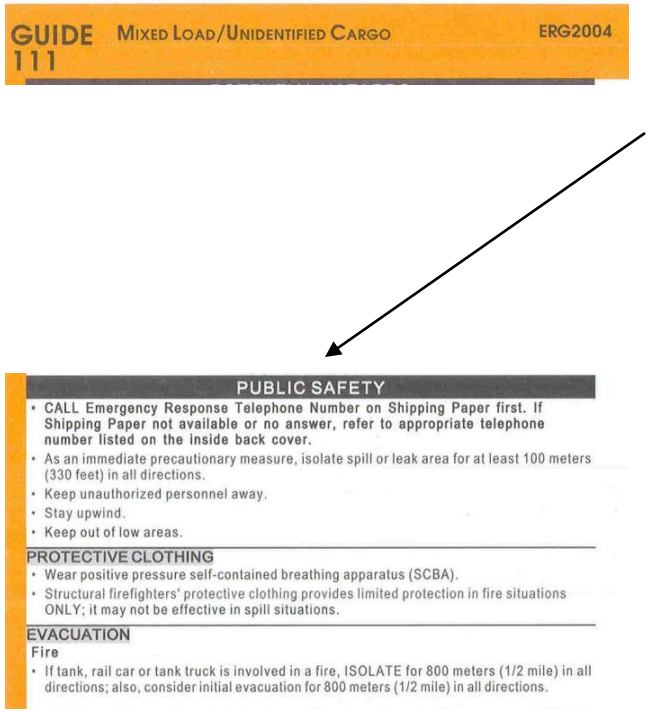
Both of these items can and should be addressed at the same time if possible?

Review the use of an Emergency Response Guide

Using the Guide to handle an incident

Guide 111

What does the Orange Pages in the Guide tell us?



GUIDE 111 MIXED LOAD/UNIDENTIFIED CARGO ERG2004

PUBLIC SAFETY

- CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations.

EVACUATION

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Public Safety -

The next section deals with addressing the problem

It lets you know:
Getting the shipping papers is important and to call their Emergency Response Telephone Number.

Isolate for 330’ in all directions (Hot Zone)

Stay upwind – (Wind at your back)

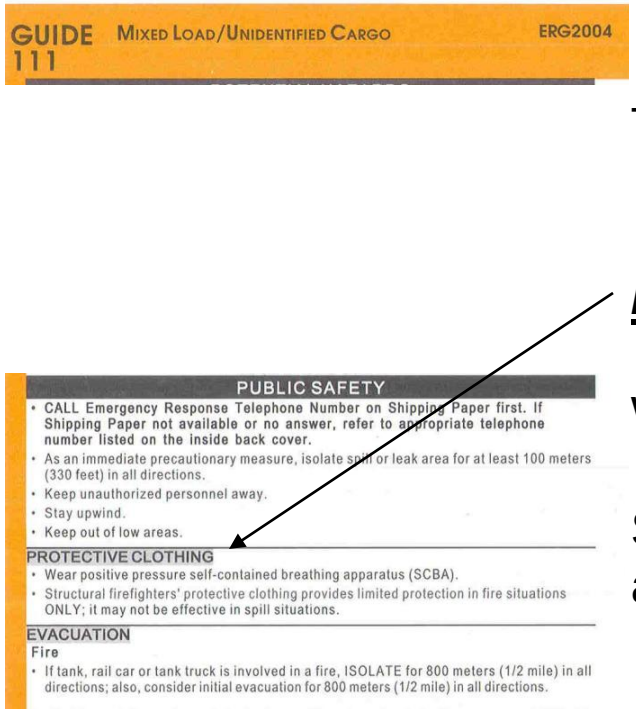
Keep out of Low Area

HOW TO USE AN EMERGENCY RESPONSE GUIDEBOOK

Using the Guide to handle an incident

Guide 111

What does the Orange Pages in the Guide tell us?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EVACUATION

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

The next section deal with addressing the problem

***Protective Clothing*:**

Wear Positive Pressure SCBA - (not a Hepa Mask)

Structural Firefighting gear has limited protection and may not be effective in spills

Review of use of an Emergency Response Guide

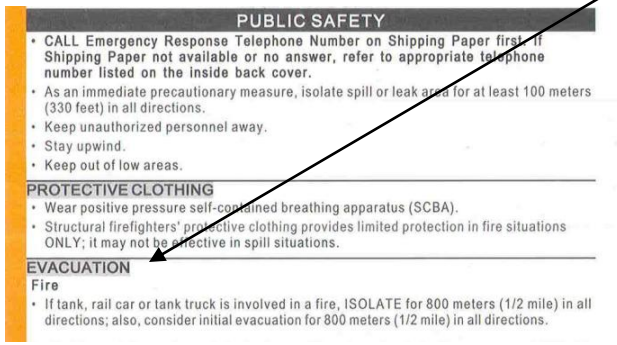
Using the Guide to handle an incident

Guide 111

What does the Orange Pages in the Guide tell us?


GUIDE 111 MIXED LOAD/UNIDENTIFIED CARGO ERG2004

The next section deal with addressing the problem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- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations.

EVACUATION

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Evacuation:

If Tank, Rail car or Tank truck on Fire –
Isolate 1/2 Mile in all directions (Hot Zone)
Evacuate 1/2 mile in all directions

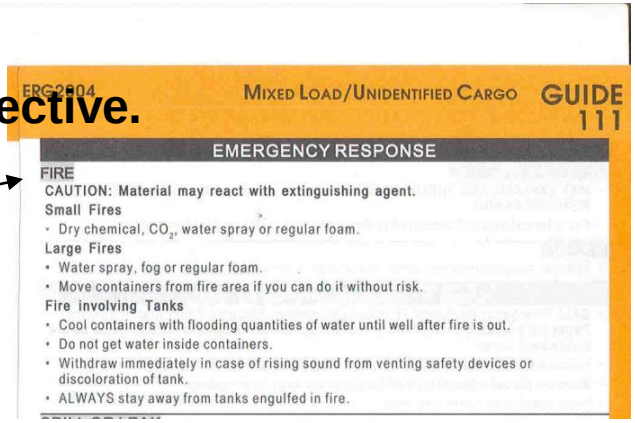
Review the use of an Emergency Response Guide

Using the Guide to handle an incident

What does the Orange Pages in the Guide tell us?

Guide 111

Page 2 - lets you know how to meet the objective.


ERG2004 MIXED LOAD/UNIDENTIFIED CARGO GUIDE 111

EMERGENCY RESPONSE

FIRE

CAUTION: Material may react with extinguishing agent.

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks

- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

<u>If you have small fire</u> – Dry Chem., CO2, water spray or regular foam.

<u>Large Fire</u> – Water spray, fog or regular foam

<u>Fire involving Tanks</u> –
Cool container – flooding quantities …..

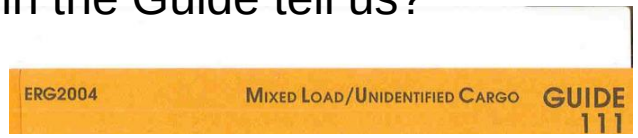
If we learn through the Bill of Ladings that our Firefighting gear is not adequate PPE,
Will we be fighting this fire because the ERG is telling us how to?

Review the use of an Emergency Response Guide

Using the Guide to handle an incident

Guide 111

What does the Orange Pages in the Guide tell us?

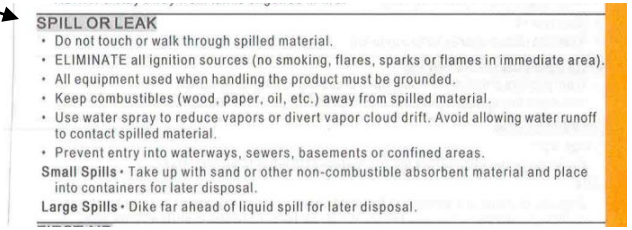


Page 2 lets you know how to meet objective.

Spills & Leaks:
Don't Touch or Walk Through

Eliminate all Ignition sources…

Explains how to **control** spill, not Cleaning it Up!



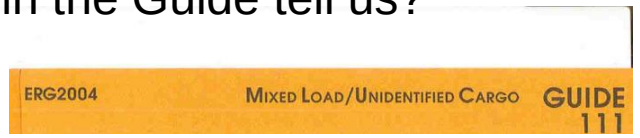
If we learn through the Bill of Ladings that our Firefighting gear is not adequate PPE,
Will we be setting up a dike in the hot zone because the ERG is telling us how to?

Review the use of an Emergency Response Guide

Using the Guide to handle an incident

Guide 111

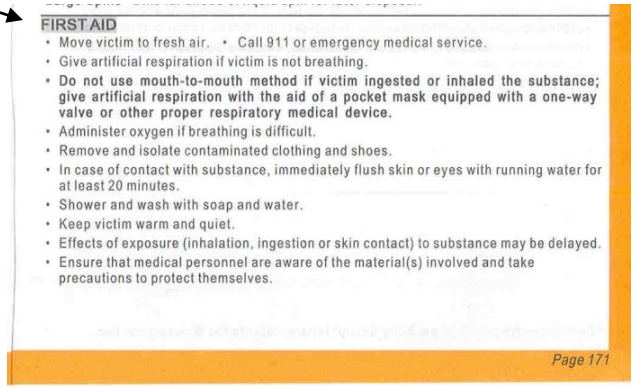
What does the Orange Pages in the Guide tell us?



Page 2 lets you know how to meet objective.

First Aid:

This section will explain what to do medically for persons that come into contact with the product.



Review the use of an Emergency Response Guide

Using the Guide to handle an incident

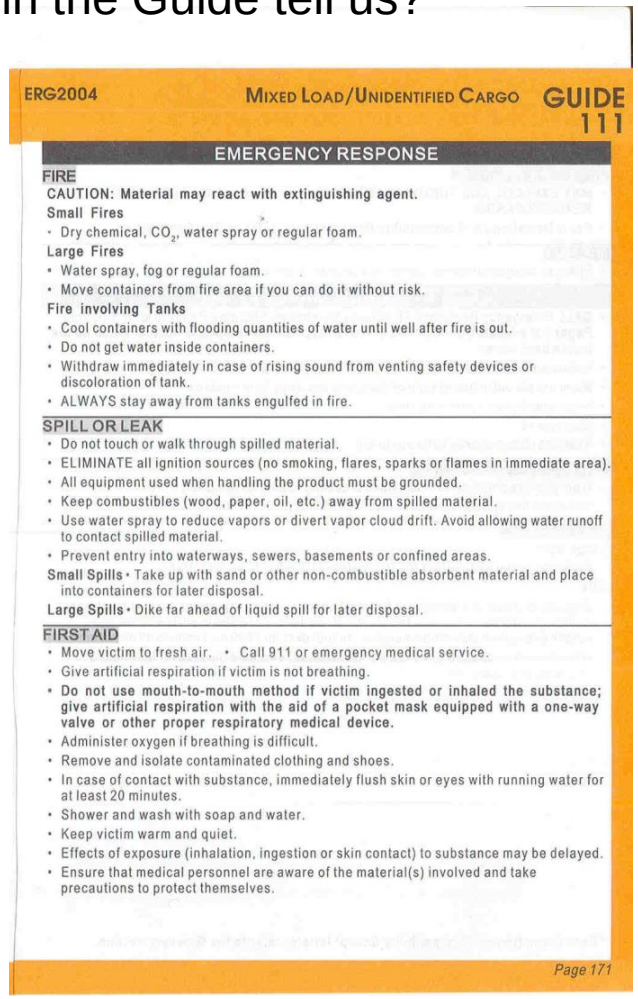
Guide 111

What does the Orange Pages in the Guide tell us?

If you have the MSDS Sheets for the specific product(s),

Use those directions over this Guides, since they are more specific to the Actual Product.

This Guide is more Generic, taking in account multiple products with same reactions.



ERG2004 MIXED LOAD/UNIDENTIFIED CARGO GUIDE 111

EMERGENCY RESPONSE

FIRE

CAUTION: Material may react with extinguishing agent.

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks

- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spills • Take up with sand or other non-combustible absorbent material and place into containers for later disposal.

Large Spills • Dike far ahead of liquid spill for later disposal.

FIRST AID

- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Shower and wash with soap and water.
- Keep victim warm and quiet.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Page 171

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

This Leaves the Green Pages,

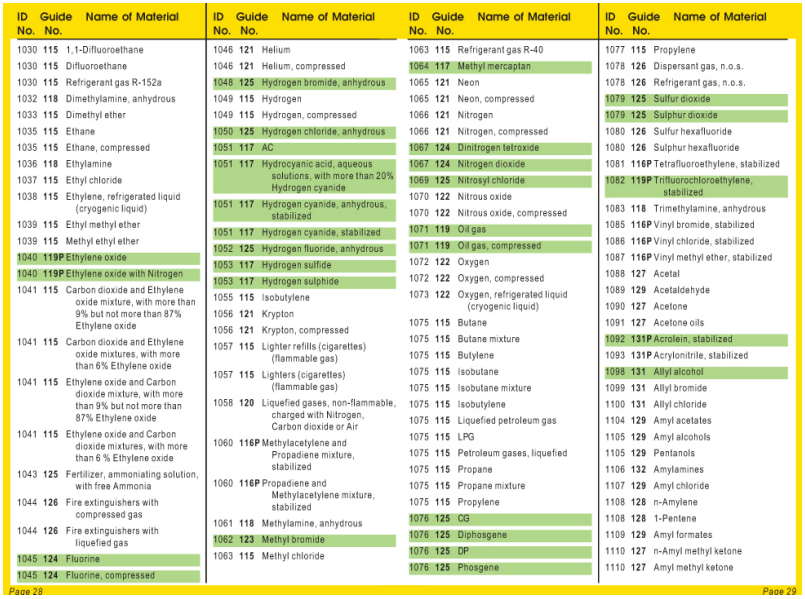
Remember what are they used for?

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

The **Green Pages** are used to identify products that are **GASES**.

When you look up a product by either Name or ID,
You'll notice some of the products names are Highlighted in green:

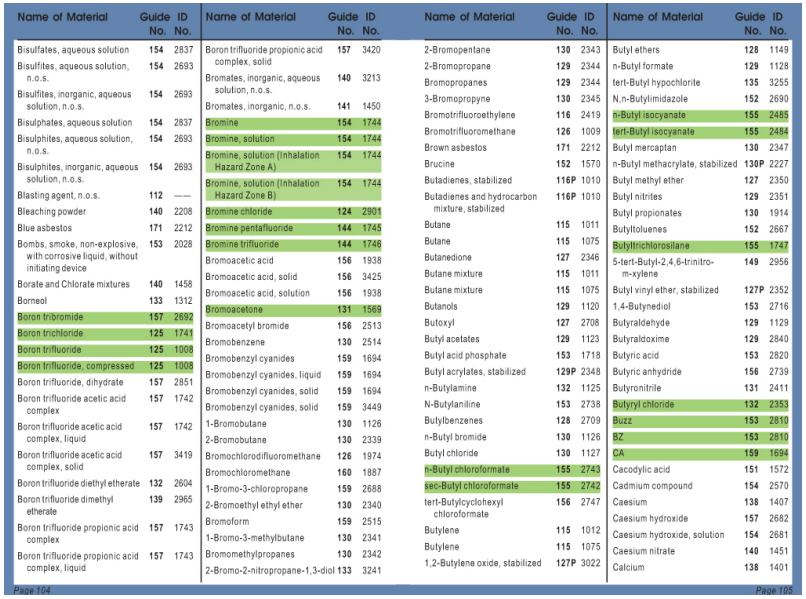


ID No.	Guide No.	Name of Material
1030	115	1,1-Difluoroethane
1030	115	Difluoroethane
1030	115	Refrigerant gas R-152a
1032	118	Dimethylamine, anhydrous
1033	115	Dimethyl ether
1035	115	Ethane
1035	115	Ethane, compressed
1036	118	Ethylamine
1037	115	Ethyl chloride
1038	115	Ethylene, refrigerated liquid (cryogenic liquid)
1039	115	Ethyl methyl ether
1039	115	Methyl ethyl ether
1040	119P	Ethylene oxide
1040	119P	Ethylene oxide with Nitrogen
1041	115	Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide
1041	115	Carbon dioxide and Ethylene oxide mixtures, with more than 6% Ethylene oxide
1041	115	Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide
1041	115	Ethylene oxide and Carbon dioxide mixtures, with more than 6 % Ethylene oxide
1043	125	Fertilizer, ammoniating solution, with free Ammonia
1044	126	Fire extinguishers with compressed gas
1044	126	Fire extinguishers with liquefied gas
1045	124	Fluorine
1045	124	Fluorine, compressed

ID No.	Guide No.	Name of Material
1046	121	Helium
1046	121	Helium, compressed
1048	125	Hydrogen bromide, anhydrous
1049	115	Hydrogen
1049	115	Hydrogen, compressed
1050	125	Hydrogen chloride, anhydrous
1051	117	AC
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide
1051	117	Hydrogen cyanide, anhydrous, stabilized
1051	117	Hydrogen cyanide, stabilized
1052	125	Hydrogen fluoride, anhydrous
1053	117	Hydrogen sulfide
1053	117	Hydrogen sulphide
1055	115	Isobutylene
1056	121	Krypton
1056	121	Krypton, compressed
1057	115	Lighter refills (cigarettes) (flammable gas)
1057	115	Lighters (cigarettes) (flammable gas)
1058	120	Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air
1060	116P	Methylacetylene and Propadiene mixture, stabilized
1060	116P	Propadiene and Methylacetylene mixture, stabilized
1061	118	Methylamine, anhydrous
1062	123	Methyl bromide
1063	115	Methyl chloride

ID No.	Guide No.	Name of Material
1063	115	Refrigerant gas R-40
1064	117	Methyl mercaptan
1065	121	Neon
1065	121	Neon, compressed
1066	121	Nitrogen
1066	121	Nitrogen, compressed
1067	124	Dinitrogen tetroxide
1067	124	Nitrogen dioxide
1069	125	Nitrosyl chloride
1070	122	Nitrous oxide
1070	122	Nitrous oxide, compressed
1071	119	Oil gas
1071	119	Oil gas, compressed
1072	122	Oxygen
1072	122	Oxygen, compressed
1073	122	Oxygen, refrigerated liquid (cryogenic liquid)
1075	115	Butane
1075	115	Butane mixture
1075	115	Butylene
1075	115	Isobutane
1075	115	Isobutane mixture
1075	115	Isobutylene
1075	115	Liquefied petroleum gas
1075	115	LPG
1075	115	Petroleum gases, liquefied
1075	115	Propane
1075	115	Propane mixture
1075	115	Propylene
1076	125	CG
1076	125	Diphosgene
1076	125	DP
1076	125	Phosgene

ID No.	Guide No.	Name of Material
1077	115	Propylene
1078	126	Dispersant gas, n.o.s.
1078	126	Refrigerant gas, n.o.s.
1079	125	Sulfur dioxide
1079	125	Sulphur dioxide
1080	126	Sulfur hexafluoride
1080	126	Sulphur hexafluoride
1081	116P	Tetrafluoroethylene, stabilized
1082	119P	Trifluorochloroethylene, stabilized
1083	118	Trimethylamine, anhydrous
1085	116P	Vinyl bromide, stabilized
1086	116P	Vinyl chloride, stabilized
1087	116P	Vinyl methyl ether, stabilized
1088	127	Acetal
1089	129	Acetaldehyde
1090	127	Acetone
1091	127	Acetone oils
1092	131P	Acrolein, stabilized
1093	131P	Acrylonitrile, stabilized
1098	131	Allyl alcohol
1099	131	Allyl bromide
1100	131	Allyl chloride
1104	129	Amyl acetates
1105	129	Amyl alcohols
1105	129	Pentanols
1106	132	Amylamines
1107	129	Amyl chloride
1108	128	n-Amylene
1108	128	1-Pentene
1109	129	Amyl formates
1110	127	n-Amyl methyl ketone
1110	127	Amyl methyl ketone



Name of Material	Guide No.	ID No.
Bisulfates, aqueous solution	154	2837
Bisulfites, aqueous solution, n.o.s.	154	2693
Bisulfites, inorganic, aqueous solution, n.o.s.	154	2693
Bisulphates, aqueous solution	154	2837
Bisulphites, aqueous solution, n.o.s.	154	2693
Bisulphites, inorganic, aqueous solution, n.o.s.	154	2693
Blasting agent, n.o.s.	112	----
Bleaching powder	140	2208
Blue asbestos	171	2212
Bombs, smoke, non-explosive, with corrosive liquid, without initiating device	153	2028
Borate and Chlorate mixtures	140	1458
Borneol	133	1312
Boron tribromide	157	2692
Boron trichloride	125	1741
Boron trifluoride	125	1008
Boron trifluoride, compressed	125	1008
Boron trifluoride, dihydrate	157	2851
Boron trifluoride acetic acid complex	157	1742
Boron trifluoride acetic acid complex, liquid	157	1742
Boron trifluoride acetic acid complex, solid	157	3419
Boron trifluoride diethyl etherate	132	2604
Boron trifluoride dimethyl etherate	139	2965
Boron trifluoride propionic acid complex	157	1743
Boron trifluoride propionic acid complex, liquid	157	1743

Name of Material	Guide No.	ID No.
Boron trifluoride propionic acid complex, solid	157	3420
Bromates, inorganic, aqueous solution, n.o.s.	140	3213
Bromates, inorganic, n.o.s.	141	1450
Bromine	154	1744
Bromine, solution	154	1744
Bromine, solution (Inhalation Hazard Zone A)	154	1744
Bromine, solution (Inhalation Hazard Zone B)	154	1744
Bromine chloride	124	2901
Bromine pentafluoride	144	1745
Bromine trifluoride	144	1746
Bromoacetic acid	156	1938
Bromoacetic acid, solid	156	3425
Bromoacetic acid, solution	156	1938
Bromoacetone	131	1569
Bromoacetyl bromide	156	2513
Bromobenzene	130	2514
Bromobenzyl cyanides	159	1694
Bromobenzyl cyanides, liquid	159	1694
Bromobenzyl cyanides, solid	159	1694
Bromobenzyl cyanides, solid	159	3449
1-Bromobutane	130	1126
2-Bromobutane	130	2339
Bromochlorodifluoromethane	126	1974
Bromochloromethane	160	1887
1-Bromo-3-chloropropane	159	2688
2-Bromoethyl ethyl ether	130	2340
Bromoform	159	2515
1-Bromo-3-methylbutane	130	2341
Bromomethylpropanes	130	2342
2-Bromo-2-nitropropane-1,3-diol	133	3241

Name of Material	Guide No.	ID No.
2-Bromopentane	130	2343
2-Bromopropane	129	2344
Bromopropanes	129	2344
3-Bromopropyne	130	2345
Bromotrifluoroethylene	116	2419
Bromotrifluoromethane	126	1009
Brown asbestos	171	2212
Brucine	152	1570
Butadienes, stabilized	116P	1010
Butadienes and hydrocarbon mixture, stabilized	116P	1010
Butane	115	1011
Butane	115	1075
Butanedione	127	2346
Butane mixture	115	1011
Butane mixture	115	1075
Butanols	129	1120
Butoxyl	127	2708
Butyl acetates	129	1123
Butyl acid phosphate	153	1718
Butyl acrylates, stabilized	129P	2348
n-Butylamine	132	1125
N-Butylaniline	153	2738
Butylbenzenes	128	2709
n-Butyl bromide	130	1126
Butyl chloride	130	1127
n-Butyl chloroformate	155	2743
sec-Butyl chloroformate	155	2742
tert-Butylcyclohexyl chloroformate	156	2747
Butylene	115	1012
Butylene	115	1075
1,2-Butylene oxide, stabilized	127P	3022

Name of Material	Guide No.	ID No.
Butyl ethers	128	1149
n-Butyl formate	129	1128
tert-Butyl hypochlorite	135	3255
N,n-Butylimidazole	152	2690
n-Butyl isocyanate	155	2485
tert-Butyl isocyanate	155	2484
Butyl mercaptan	130	2347
n-Butyl methacrylate, stabilized	130P	2227
Butyl methyl ether	127	2350
Butyl nitrites	129	2351
Butyl propionates	130	1914
Butyltoluenes	152	2667
Butyltrichlorosilane	155	1747
5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956
Butyl vinyl ether, stabilized	127P	2352
1,4-Butynediol	153	2716
Butyraldehyde	129	1129
Butyraldoxime	129	2840
Butyric acid	153	2820
Butyric anhydride	156	2739
Butyronitrile	131	2411
Butyryl chloride	132	2353
Buzz	153	2810
BZ	153	2810
CA	159	1694
Cacodylic acid	151	1572
Cadmium compound	154	2570
Caesium	138	1407
Caesium hydroxide	157	2682
Caesium hydroxide, solution	154	2681
Caesium nitrate	140	1451
Calcium	138	1401

If the product is Highlighted Green, this lets you know the Product is a Gas and the **Green Pages need to be looked at**.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

The Green Pages provide two different types of recommended safe distances which are:

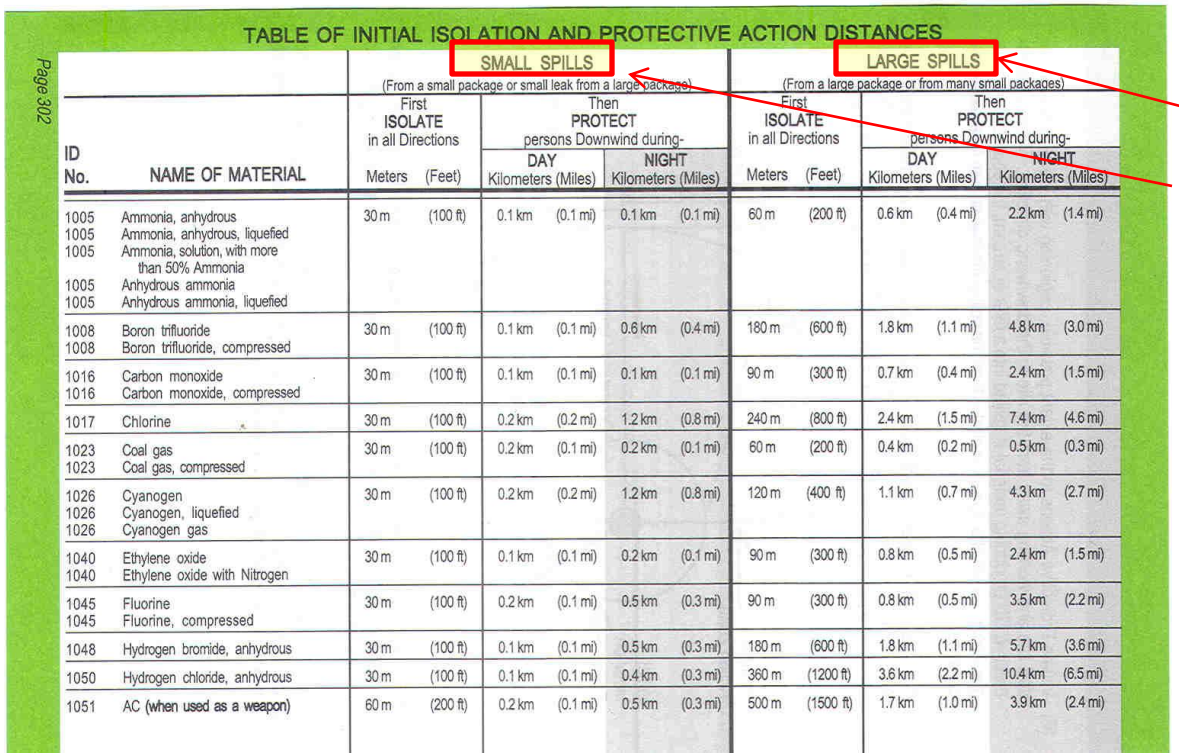
"**Initial isolation distances**" - (Hot Zone)

and

"**Protective action distances**." – (Evacuation Area)

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



Page 302

TABLE OF INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package) First ISOLATE in all Directions Meters	(Feet)	Then PROTECT persons Downwind during- DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	LARGE SPILLS (From a large package or from many small packages) First ISOLATE in all Directions Meters	(Feet)	Then PROTECT persons Downwind during- DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1005 1005 1005 1005 1005	Ammonia, anhydrous Ammonia, anhydrous, liquefied Ammonia, solution, with more than 50% Ammonia Anhydrous ammonia Anhydrous ammonia, liquefied	30 m	(100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	60 m	(200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)
1008 1008	Boron trifluoride Boron trifluoride, compressed	30 m	(100 ft)	0.1 km (0.1 mi)	0.6 km (0.4 mi)	180 m	(600 ft)	1.8 km (1.1 mi)	4.8 km (3.0 mi)
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NOTE The TOP:

It's Broken into:

Small & **Large** Spills

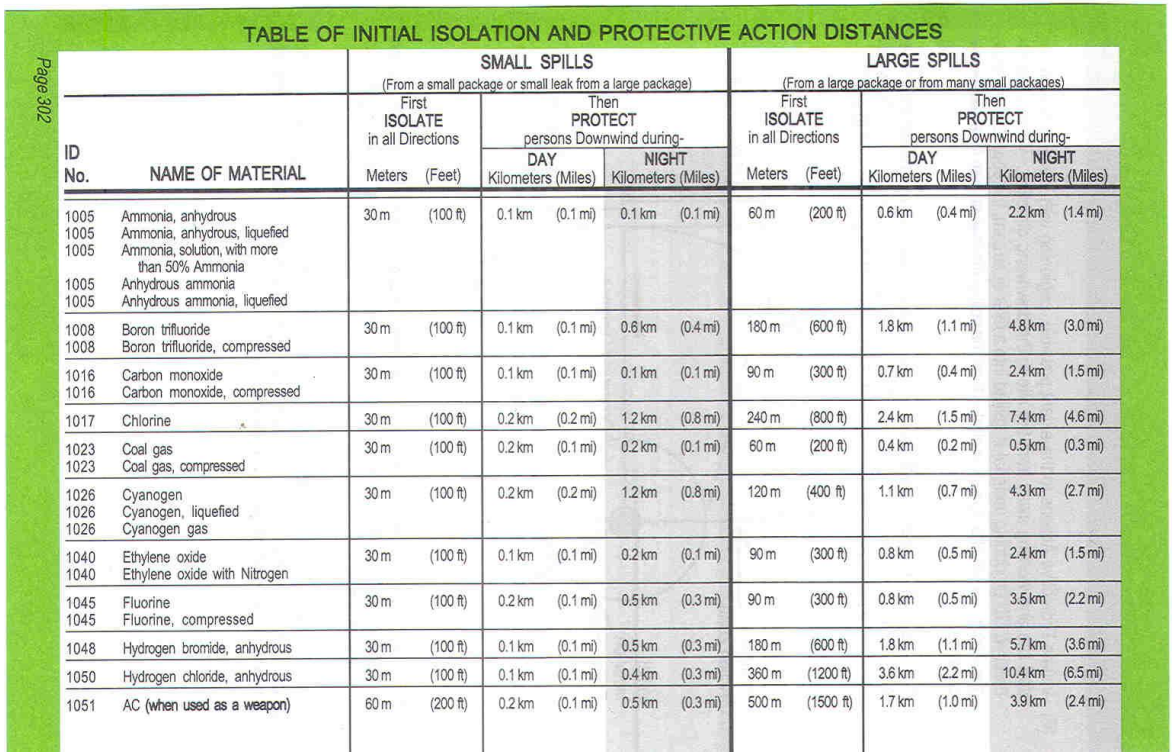
Small = usable amounts

Large = Multiple amounts,
as a cases or tanker.

Use better judgment,
not written in stone,
Always better to be safe,
Leaning to large,
then sorry under estimating.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



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Isolation :

This is around the entire spill. (center outwards)

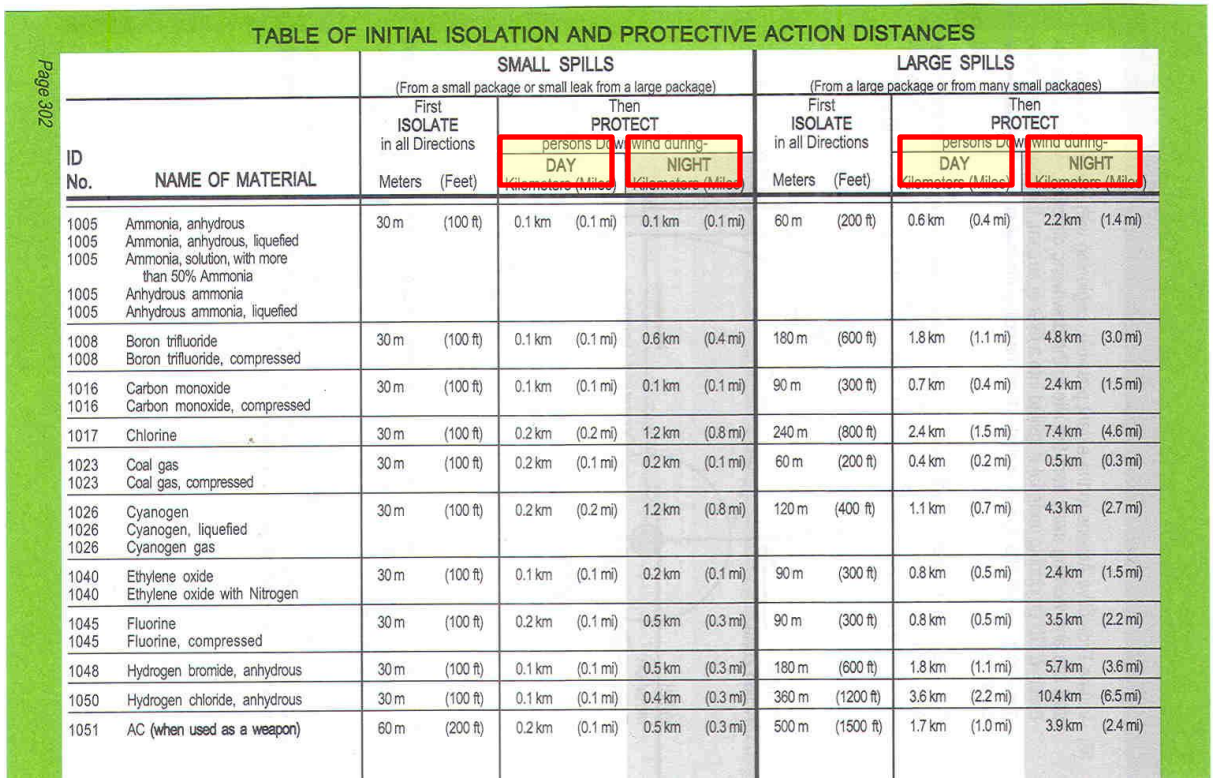
This will be the “Hot zone”

No personnel shall enter without **proper PPE**.

Everyone or thing inside consider contaminated until proven otherwise.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



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Protect :

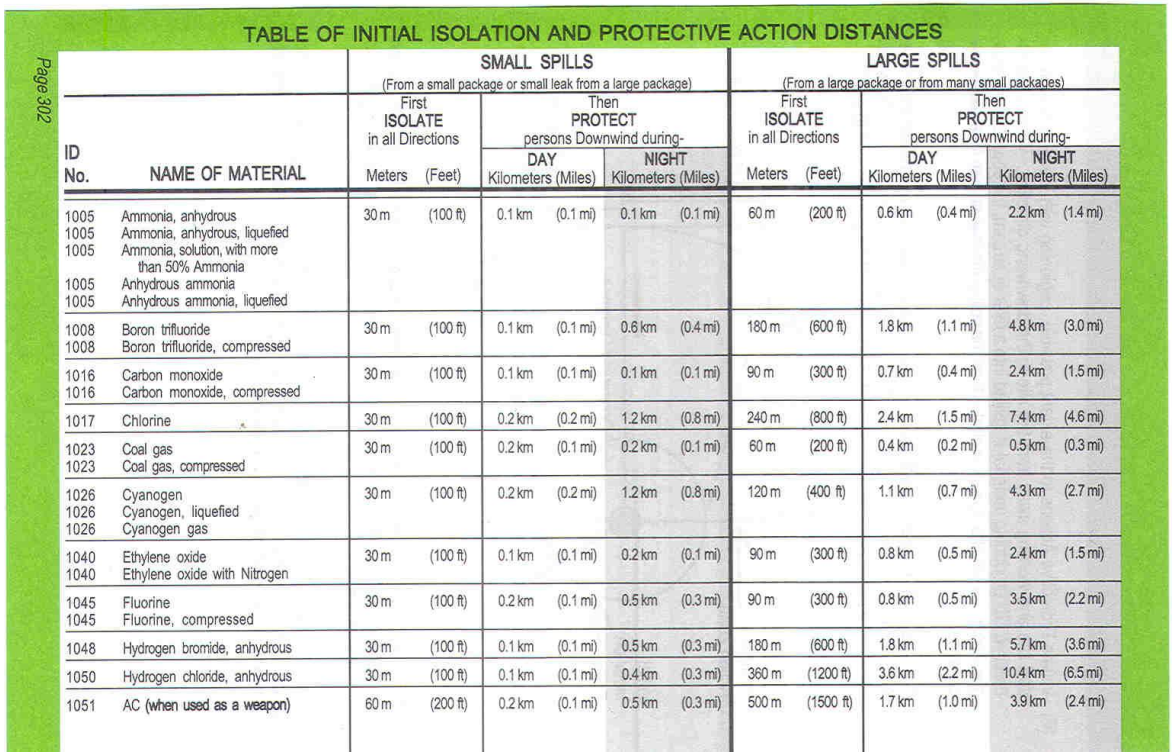
This is the evacuation area.

This defines who could be effected by the product within 30 minutes of the spill.

Since **day time** air is lighter then the **nights air -** *(once Sun sets)*, you can see there are 2 different distances.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



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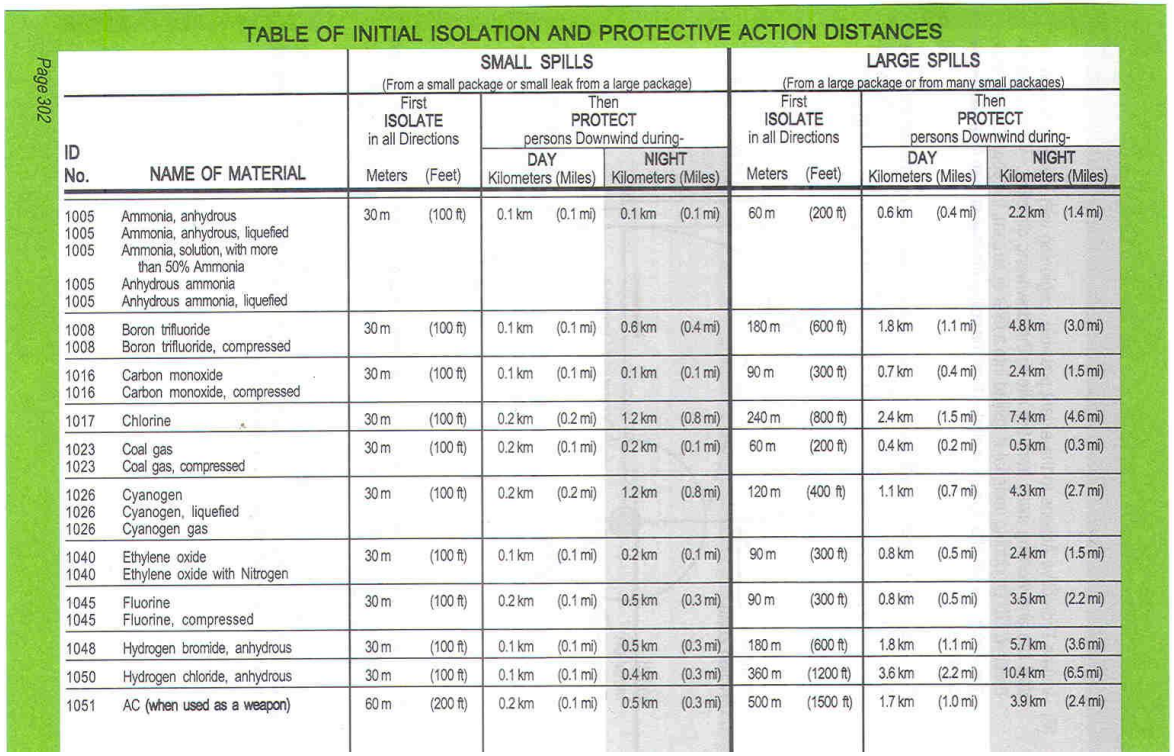
Protect :

Evacuation is only done to the Downwind direction, from the spill.

Note – Wind directions can change during the event, **so will the protected area**, wind and atmosphere need to be Monitored constantly.

Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG



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1005	Ammonia, anhydrous, liquefied												
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1026	Cyanogen, liquefied												
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1040	Ethylene oxide	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	90 m	(300 ft)	0.8 km	(0.5 mi)	2.4 km	(1.5 mi)
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Protect :

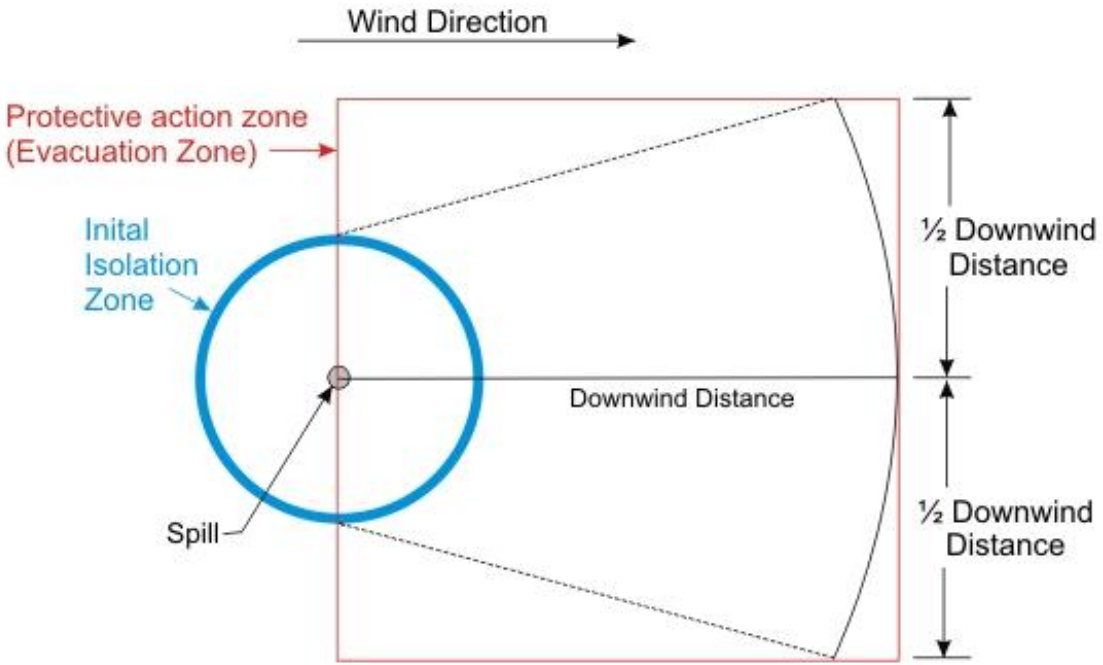
Evacuation not only means removing people from the area, but if this will create a larger hazard for the people being evacuated, then it can mean, sheltering in place:

Closing windows, turning off burners, air conditioners…. and leaving them where they are at, as long as they are inside a form of shelter.

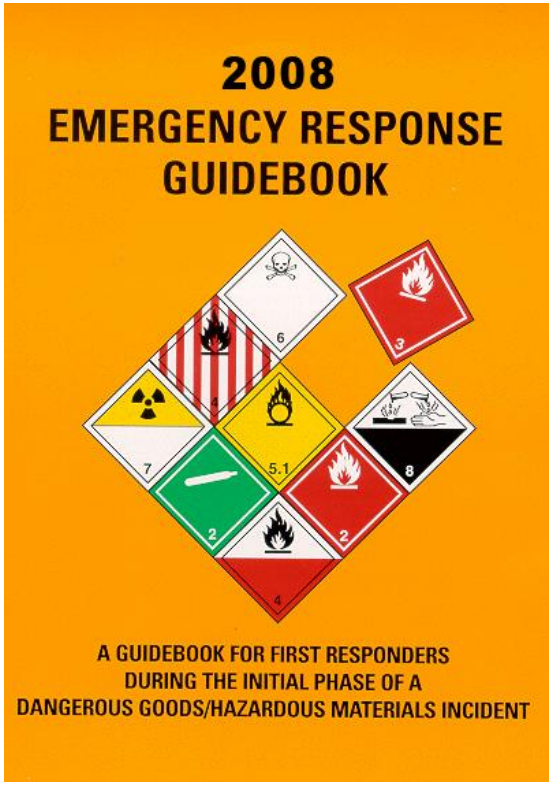
Review the use of an Emergency Response Guide

Putting what we now know to use, utilizing the ERG

Isolation & Protection Zones



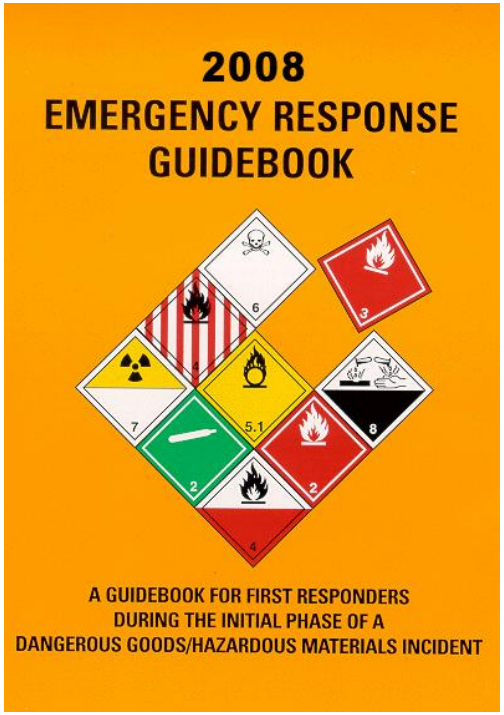
Review the use of an Emergency Response Guide



What if the Guide doesn't have the Information you need?

Review the use of an Emergency Response Guide

Go to the last page of the Guide (inside back cover):



UNITED STATES

1. CHEMTREC®

1-800-424-9300
(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
703-527-3887 For calls originating elsewhere
(Collect calls are accepted)

2. CHEM-TEL, INC.

1-800-255-3924
(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
813-248-0585 For calls originating elsewhere
(Collect calls are accepted)

3. INFOTRAC

1-800-535-5053
(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
352-323-3500 For calls originating elsewhere
(Collect calls are accepted)

4. 3E COMPANY

1-800-451-8346
(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
760-602-8703 For calls originating elsewhere
(Collect calls are accepted)

5. MILITARY SHIPMENTS

703-697-0218 - Explosives/ammunition incidents
(Collect calls are accepted)
1-800-851-8061 - All other dangerous goods incidents

These are additional numbers to call, with 24 hours support, they can help you further.

Review the use of an Emergency Response Guide

Lets review with a Scenario:

A tanker truck carrying the following product rolled over and is leaking from the top hatch.

NOW WHAT?

Review the use of an Emergency Response Guide

Lets review with a Scenario:

The ID No. is 1202 and it is a flammable liquid (Class 3, red placard);

The **YELLOW**-bordered pages indicate that the substance is *Diesel fuel* or *Fuel oil*, and refers to **Guide 128**;

The substance is not highlighted; there is no need to use the **GREEN** Section;

The **Guide 128** corresponds to ***Flammable Liquids (Non-Polar / Water-Immiscible)***;

As an immediate precautionary measure, the Guide suggests to isolate spill or leak area for at least 150 feet in all directions.

Review the use of an Emergency Response Guide

Lets review with a Scenario:

At **Guide 128**, under the ***Potential Hazards*** Section, the ***Fire or Explosion*** hazards precede the ***Health*** hazards;

This type of substance is flammable and vapors may form explosive mixture with air;

Most vapors are heavier than air, they will spread along the ground and collect in low or confined areas;

Containers may explode when heated;

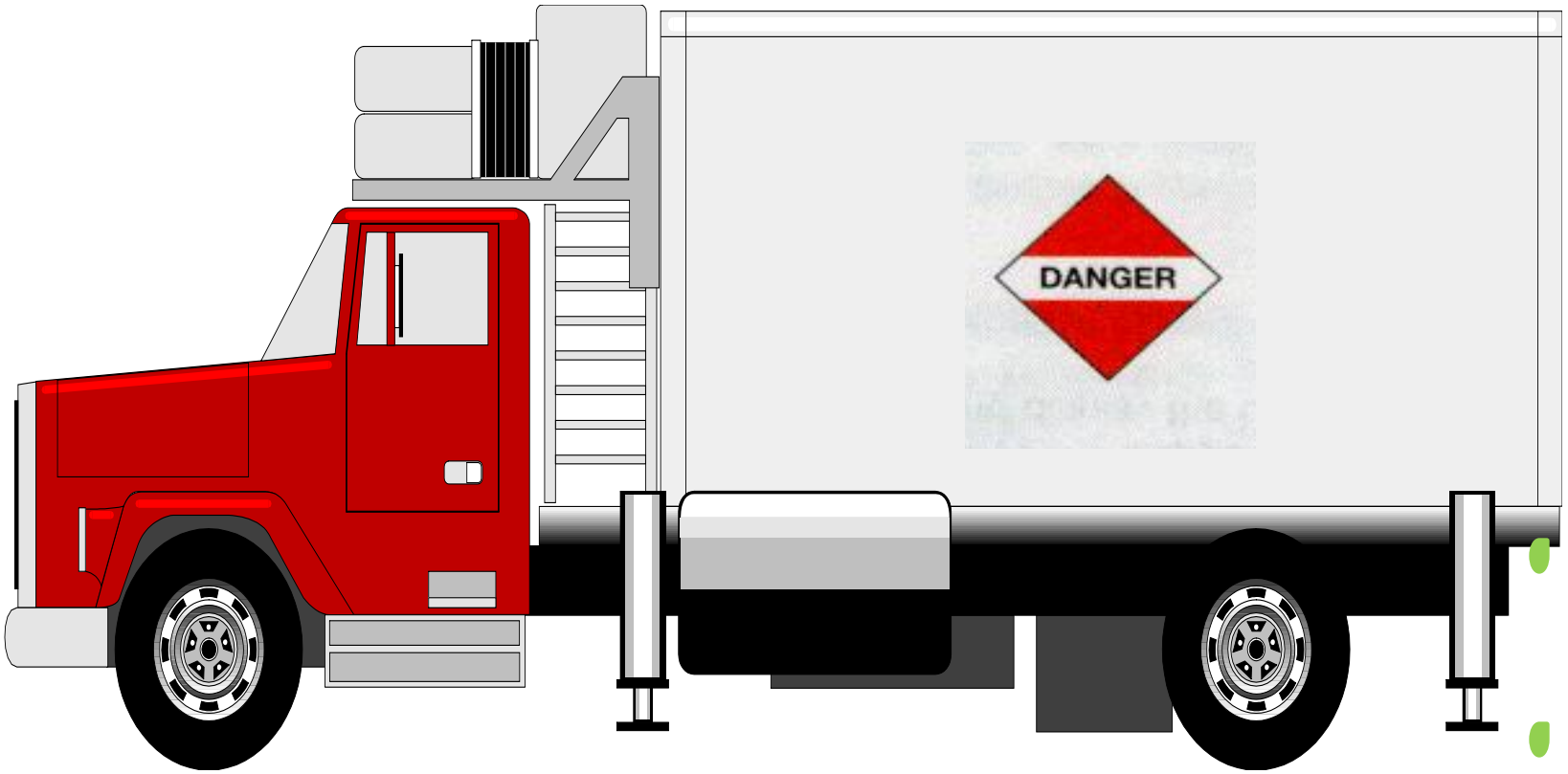
Inhalation or contact with material may irritate or burn skin and eyes.

PPE – Structural Firefighter clothing w/ SCBA

Review the use of an Emergency Response Guide

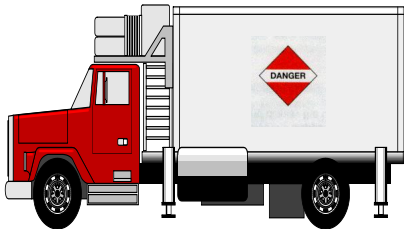
Lets review with a Scenario:

This is your Hazard Call – Now what?



Review the use of an Emergency Response Guide

Lets Review:



There is no ID No. and this DANGER placard is no big help using page 16-17 and refers us to **Guide 111**

If we referring to transportation vessels page 18 & 19

It indicates a mixed load box truck with possible dangerous goods and also refers us to **Guide 111**,

Mixed Load / Unidentified Cargo;

As an immediate precautionary measure, the Guide suggests to isolate the area for at least 330 feet in all directions, until the contents of the vehicle is known;

In case of fire, the Guide suggests to isolate for 1 mile in all directions and to consider an initial evacuation of ½ mile in all directions;

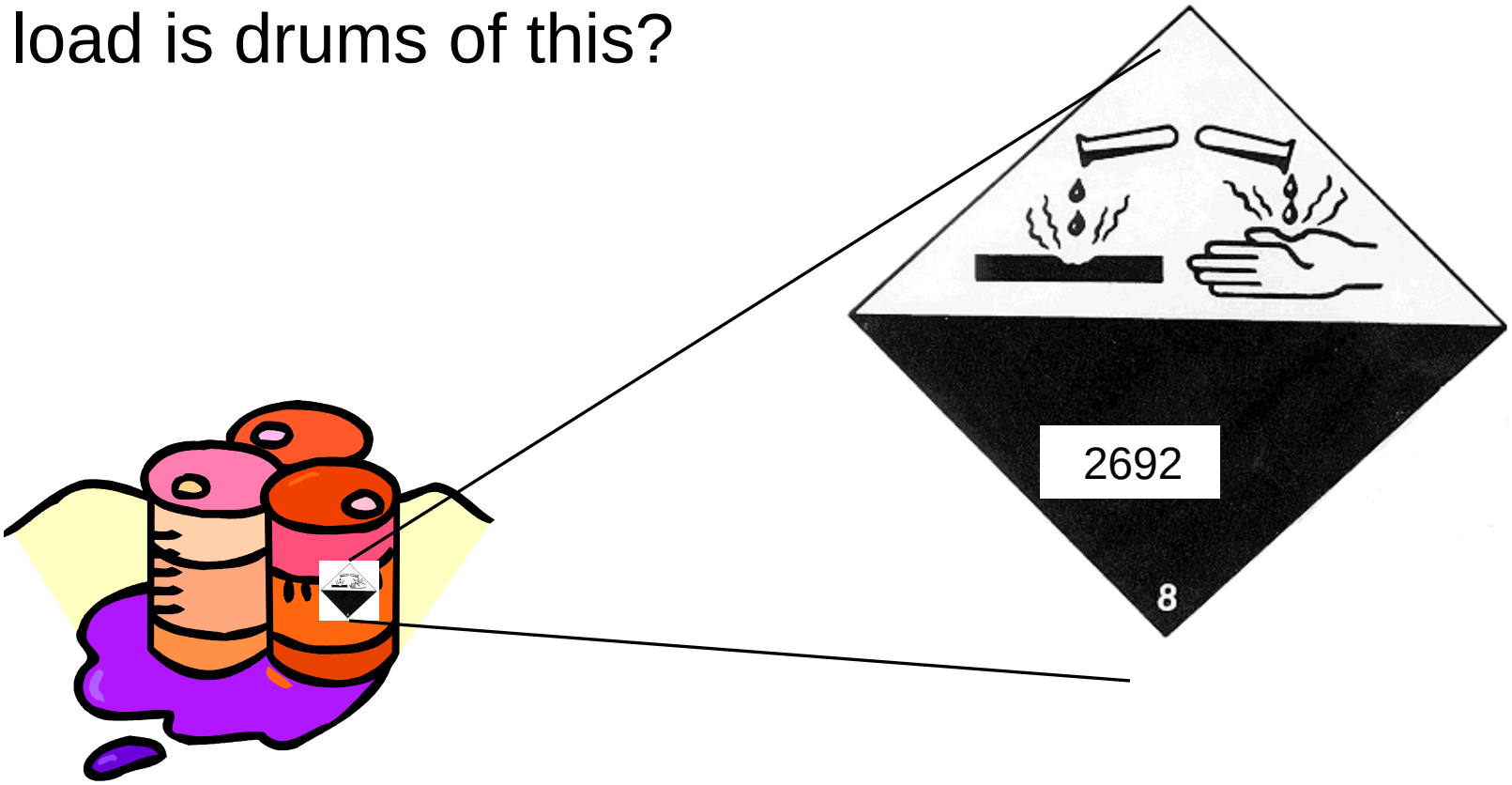
What else will we do? (**maybe get papers from driver** ?)

Review the use of an Emergency Response Guide

Lets review with a Scenario:

You later learn from the driver:

The load is drums of this?



Review the use of an Emergency Response Guide

Lets review with a Scenario:

The ID No. is 2692;

The **YELLOW**-bordered pages indicate that this substance is called *Boron tribromide;*

It refers to **Guide 157** and is highlighted;

The **Guide 157** correspond to ***Substances – Toxic and/or Corrosive (Non-Combustible / Water-Sensitive)***;

Since the substance is highlighted and there is a spill situation, the **GREEN** Section must be used to determine the Initial Isolation and Protective Action Distances;

For this product, the **GREEN** Section presents 2 separate entries for ID No. 2692: the 1st one applies when the product is spilled on the ground and the 2nd one, when it is spilled in water;

Review the use of an Emergency Response Guide

Lets review with a Scenario:

In this case, the product is spilled on the ground and the Initial Isolation Distance suggested in the **GREEN** Section is 90 feet in all directions for a small spill and 180 feet in all directions for a large spill;

Additionally, the Protective Action Distances for day and night will have to be taken from the **GREEN** Section;

The **Guide 157** indicates that this type of substance is toxic and non-combustible, but a fire will produce irritating, corrosive and/or toxic gases.

PPE – SCBA

Chemical Protective clothing – that is recommended by manufactured

Firefighting gear – limited protection – use fire situations only – (**not effective in spill situations**)

HOSE COMPANY 2 - WESTBURY FIRE DEPT.

ANNUAL HAZ-MAT REFRESHER

Take 10 minutes

Levels of Personal Protective Equipment - PPE

What are the levels of protection at a Haz-Mat Incident?

Level D – Lowest Level Required

- Coveralls
- Gloves
- Steel shank, chemical resistant shoes
- Head protection
- Eye Protection

Does Firefighting gear meet this requirement
YES – as long as FF has eye protection.

Levels of Personal Protective Equipment - PPE

What are the levels of protection at a Haz-Mat incident?

Level C –

- APR – Air Purifying Respirator
- Hooded splash protective suit
- Gloves – Inner and Outer
- Steel shank, chemical resistant shoes
- Head protection
- Eye Protection

Levels of Personal Protective Equipment - PPE

What are the levels of protection at a Haz-Mat incident?

Level B –

- Pressure Demand Respirator - SCBA
- Hooded splash protective suit
- Gloves – Inner and Outer
- Steel shank, chemical resistant shoes
- Head protection
- Eye Protection
- Radio Communication optional but recommended

What is a limitation with Level B not found in Level C ?

Levels of Personal Protective Equipment - PPE

What are the levels of protection at a Haz-Mat incident?

Level A – Best Protection

- Pressure Demand Respirator - SCBA
- fully encapsulated protective chemical suit
- Gloves – Inner and Outer
- Steel shank, chemical resistant shoes
- Head Protection
- Eye Protection
- Radio Communication inside suit

Putting our Operations Level Skills to use

What is our first responsibility at the Operational level?

Remember at Operations Level - we're playing **Defense**:

First thing we need to do is **Recognize what we have**:

- Look for those warning signs: Placards, chemical name …
- Use our 4 Gas detector – read our immediate environment
  Are we stand in an explosive environment – LEL, UEL
  Are we in a Oxygen deficient environment – level O2 < 19%
  What are the CO, H2S levels?

We need to makes sure **we** are in a **safe** environment before we can do anything or help anyone.

- Ask questions: driver, facility staff or person making the call,
  What is spilled, how much is there, what are conditions…

Putting our Operations Level Skills to use

Identifying the product we are dealing with is only a small part of the recognition process, we also need to recognize:

- How much of it is there,
- How will it effects us,
- what PPE we'll need,
- how and what will it react with …
- how close we can get to it,
- what obstacles may we occur when trying to controlling it …

This is where we take that product name, ID #, container or placards ID and reference in of ERG, to help guide us.

We'll use the recommended PPE, Isolation zone …
and put together an Initial Action Plan for the incident.

Recourses the IC has available to them, will determine their Initial action plan. Do we have the proper PPE, do we have enough members to evacuate the required ½ a mile…

Putting our Operations Level Skills to use

The Next step in the Process is to **Isolate**.

Using the data we've collected, we want to set boundaries,
These boundaries: **Site Safety Control Plan**

Hot Zone – Where people inside **are contaminated** or will be,

- do we always **enter** this isolation zone to evacuate?
- can the people leaving this zone contaminate us or others?

Warn Zone – Contaminate reduction zone - with proper PPE, probably where we as operations level will be operating? Where we'll make the contaminated safe before they are moved to safe areas.

Cold Zone – safe area – No PPE required. Our staging/rehab and medical areas.

In Isolation – we are separating bad/contaminated with good/ not contaminated.

We need to gain control of the scene quickly, so we don't have contaminated people show up at hospitals miles away.
Who did they come in contact while in route…? (especially biological)

Putting our Operations Level Skills to use

Once these boundaries are established, they need to be monitored with meters. Wind changes, temperature changes, even time of day will effect how safe our set boundaries remain constant and remain safe.

We need to be prepared to re-establish the boundaries parameters if our conditions do change.

A liquid leak that has made its way to the storm drain system, Is this going to change our initial isolation zone, if we first viewed the tanker as on it's side with no apparent leak?
With the new isolation zone are we now the contaminated?

Or that container that <u>wasn't</u> off gassing, now is, because the sun came up - does this change things for us?

<u>An important factor</u> - we are **NEVER** going to isolate or work beyond our training limits or our PPE limitations.
In most cases our PPE will be our Firefighting gear and SCBA, which are **not** chemical resistant.
How much evacuation are you doing walking in a SCBA?

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

By **Protect** we mean take protective actions, preventing it form getting worst. First protecting us, then others, then property and environment.

Again how much protective action we'll be taking, depends on the **Product and the PPE** we have available to us.

If conditions allow us to, **we can**:
- confine the spill to a specific area
- contain the leak by setting up dikes to control the run off,
- stop the leak by plugging it,

In that order – **far away - to closer**.
Example would be diesel fuel, our Firefighting gear with SCBA is adequate PPE to perform these tasks.

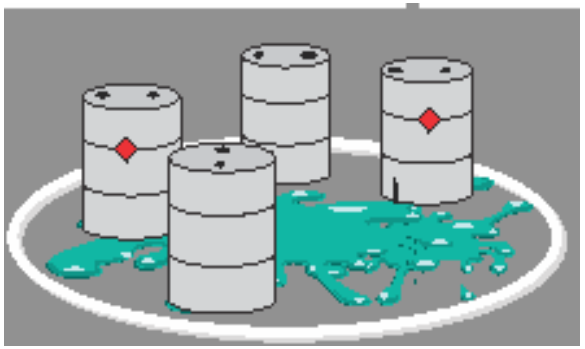
What if the spill was from a 500 gallons tank of hydrogen cyanide?

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

<u>Defense Control Measures include</u>:



Diking – Physical confinement of a product using barriers to control its movement, when on solid surface. (waterway = dam)

Can this be done from a safe distance?

Do we have adequate resources for a dike?

Methods: dirt, speedy dry, wood/boards, ladder, charged hose line…

Diverting– A defensive confinement procedure to intentionally control the movement of a hazardous material into an area where it will pose less harm to the community and the environment.

Can this be done from a safe distance?

Do we have adequate resources for a divert?

Where are we diverting the product to?

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

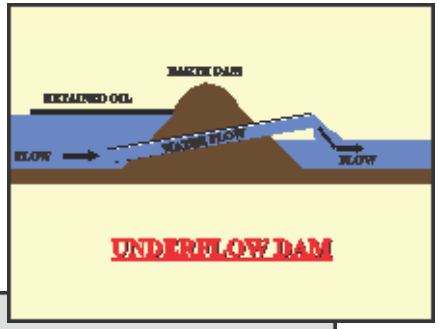
<u>Defense Control Measures include</u>:

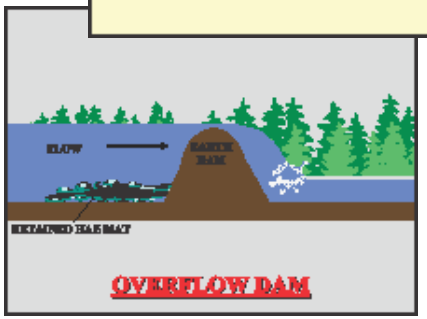
Damming– A defensive confinement procedure consisting of constructing a barrier to totally immobilize a <u>flowing waterway</u> contaminated with a liquid or solid hazardous substance.

Can we even get that close to the product to do safely?
Do we have enough resources to do effectively?

<u>Underflow dam</u> – products lighter the water
Allows clean water to flow through from bottom

<u>Overflow dam</u> for products heavier then water
Allows clean water to flow through top





Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

<u>Defense Control Measures include</u>:

Absorption – (do everyday w/ vehicle leaking…)
With our PPE can we even do?
Once we absorb it, what do we do with it?
Do we have adequate resources and or PPE to do effectively

- Effective with products < 50 gallons

Can use: Dirt, Saw Dust, Absorbent: Pads, Socks or Pads, Speedy Dry

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

Defense Control Measures include:

Dilution – Reduces the concentration to a less hazardous state
Can the product even be diluted? (*can diesel fuel be diluted ?*)
Will diluting it with water actually reduce the hazard or make more?
Do we have adequate resources and the PPE to do effectively?
•(*Hybrid car battery for example – will water be effective?*)

No: in most cases you'll just be making more acid!

Cooling the Container –
Can this be done from a safe distance?
Do we have adequate water supply to start and maintain?
Will cooling the container cause us other problems?

(Seaford/Oyster bay – propane incident done for many days)

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

Defense Control Measures include:

Vapor Suppression – reduction or elimination of vapor of a product produced by a spill

Can we actually suppress Vapors ?
If so, what's the most common way ?
Do we have adequate resources and or PPE to do effectively?
What type of foam do we need: *Protein, AFFF, AR-AFFF, High X …*
Once we know Type at what % (*1-6% foam solution*)
How do we apply? (*Bounce off or Rain fall technique*)

Vapor Dispersion – using a water spray to direct the hazardous Vapors away from areas

Can this be done from a safe distance?
Do we have adequate water supply to start and maintain?
Is the material water soluble ? (dissolves in water)

- Usually done when gas is heavier then air, keeping from low areas

- **Important to Make sure you know the product before you do either**!

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Remember – as Operations Level we're on the defense!

<u>Defense Control Measures include</u>:

<u>Turning off the source</u> -

- Remote valve(s)
- Emergency shut off

ONLY IF OUR PPE ALLOWS US TO!

Something we do at every CO emergency when we find CO source we turn it off.

Putting our Operations Level Skills to use

<u>Now for a chemical outside our PPE limitations</u>:

Our Protective actions may be to dike the sewers down hill 1500’ away, outside of the hot zone.

Limit heat sources outside the hot zone in case the hot zone increase because the container decides to off gas as the sun come up and heats the tank.

Evacuate – in anticipating of the rain due in this afternoon…

Setting up portable master streams so if there is a fire, they can be charged and operated from save distances.

*We will **not be operating in the hot zone**,*
but we can work to anticipate and growing hot zone*,*
taking possible protective actions before hand.

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

<u>Another Part of protecting is Metering and Monitors:</u>

Conditions at HazMat incident can change without warning.

We need to assure the areas we are operating in remain safe, and this can only be achieved my <u>monitoring the conditions</u>.

Meters can also be used to determine the effectiveness of our Actions - Are our actions making conditions better?

The 4 items we want to monitor:

O2 – does the atmosphere have enough oxygen in it?
understand < O2 mean another gas has taken its place

CO – since odorless, tasteless & colorless and our blood will grab a CO molecule before an O2 we need to know if in air

Explosive Level (LEL/UEL) - are we in an explosive environment

H2S – Hydrogen sulfide (flammable, toxic and take the place of O2)

This is why the 4 gas meter is carried on all the rigs.

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Another Part of protecting is Metering and Monitors:

02 – want to be in the range 19.5% - 23.5%
Below is considered oxygen deficient
Over 23.5 % we are nearing an explosive environment

Meter will alarm if < 19.5 or over 23.5%

CO – measured in ppm w/ 35 ppm over 8hr period is acceptable
The higher this number is, the quicker it will effect us
35-200ppm over 2 hrs = flu symptoms
200-800 over 1 hrs = dizziness & vomiting
Over 800 = unconsciousness & brain damage within minutes

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

Another Part of protecting is Metering and Monitors:

Explosive Level – range of 0-100%
10% is the LEL – for most hydrocarbon gases

Meter will alarm if < 10 - 20%
Note – when you are at UEL the further you get from the leak, will put you in an explosive atmosphere.

H2S – measured in ppm w/ 10 ppm set at a low alarm and 15 as a high alarm.

10–20 ppm is the borderline concentration and you'll have eye irritation.
50–100 ppm leads to eye damage.
100–150 ppm nose nerves get paralyzed after a few inhalations, and the sense of smell disappears.
320–530 ppm leads to pulmonary edema with the possibility of death.
530–1000 ppm causes strong stimulation of the central nervous system and rapid breathing, leading to loss of breathing.
Concentrations over 1000 ppm cause immediate collapse with loss of breathing, even after inhalation of a single breath.

Putting our Operations Level Skills to use

The Next step for us as Operation Level Responders is to **Protect**:

<u>Another Part of protecting is Metering and Monitors:</u>

Other Metering or monitoring may be done, under the direction of a Hazmat Tech or Specialist.

These techs or specialist may set up a monitoring station and have an Operations person monitor and let them know of changes.

As with the PPE, we shouldn't be working outside our training and this includes meters & monitors. Some of these meters require the user to be up close to the product, requiring the appropriate PPE.

Putting our Operations Level Skills to use

The Last step for us as Operation Level Responders is to **Notify**:

If we as operational level first responders can't mitigate the situation because it exceeds our limitation in training or PPE capabilities we need to notify an authority who can.

In most cases this will be the Nassau County Fire Marshalls and/or Hicksville FD Haz-Mat team who operate that the Technician Level.

Although Westbury FD has about 8 Haz-Mat Techs, we don't have all the required equipment to operate at the Technician Level and is the reason why the department guidelines still have us at an Operational Level Service. In most cases our Haz-Mat techs will be utilized in assisting these incoming team with performing Tech tasks.

Putting our Operations Level Skills to use

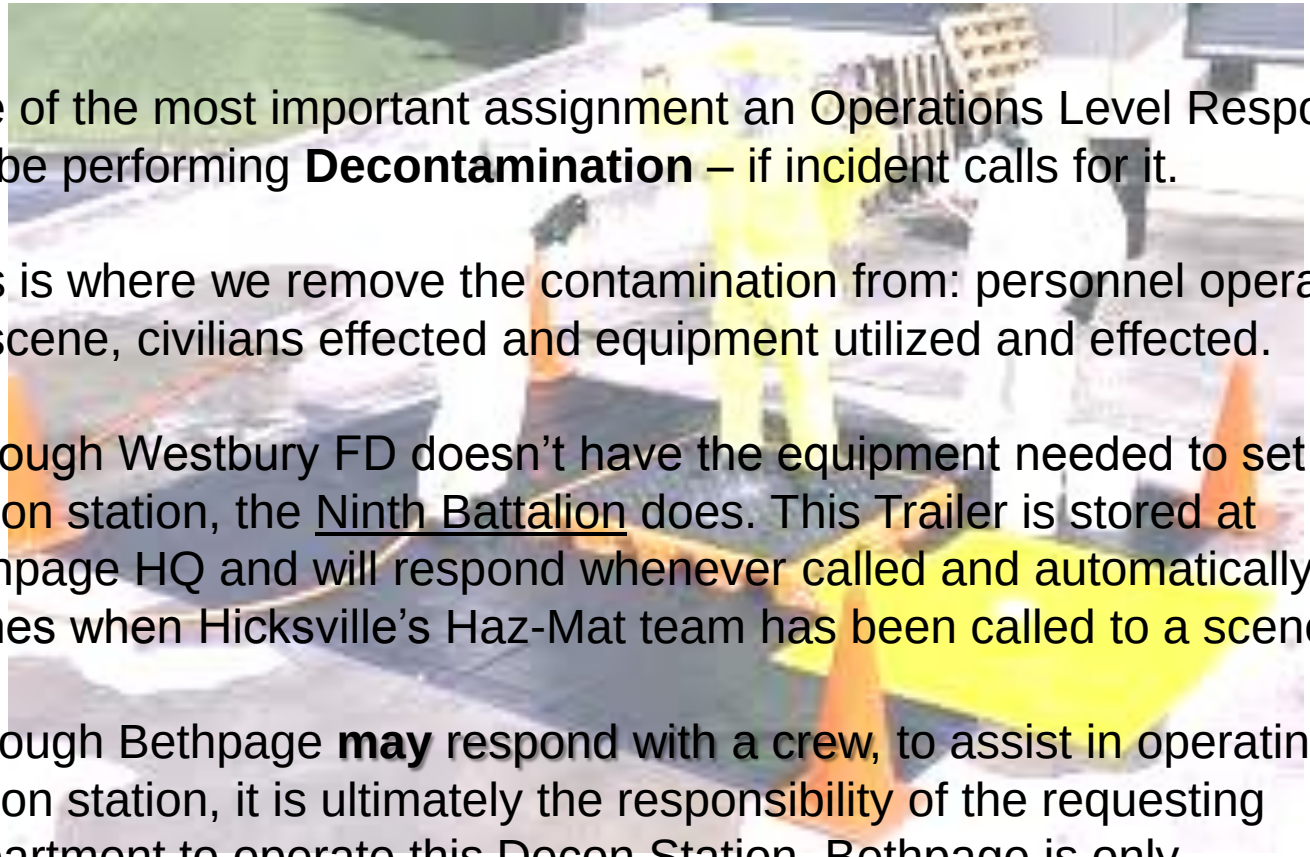
At the Operational Level, we still have a responsibility to assist the Haz-Mat techs and/or Specialist as needed.

<u>We will be the persons</u>:

Helping the team stage their equipment
Assist the team dressing in their appropriate suits
Assisting them in safely getting to the hot zone
Assisting them with Decontamination
Providing emergency suit removal if needed
Providing the continuing monitoring of zones

Just because we've called them to assistance we are not done by any means.

Putting our Operations Level Skills to use



One of the most important assignment an Operations Level Responder will be performing **Decontamination** – if incident calls for it.

This is where we remove the contamination from: personnel operating on scene, civilians effected and equipment utilized and effected.

Although Westbury FD doesn't have the equipment needed to set up a Decon station, the Ninth Battalion does. This Trailer is stored at Bethpage HQ and will respond whenever called and automatically comes when Hicksville's Haz-Mat team has been called to a scene.

Although Bethpage **may** respond with a crew, to assist in operating the Decon station, it is ultimately the responsibility of the requesting Department to operate this Decon Station, Bethpage is only responsible for providing the equipment, which is Battalion Equipment, in the state issued trailer.

Putting our Operations Level Skills to use

Remember our **Decontamination Priorities**:

1. Protection of the Decontamination Crew
2. Protection of all other responders
3. Care and decontamination of Civilians
4. Minimize environmental damage and property loss

We'll **always** decontaminate Ambulatory **BEFORE** Non- Ambulatory

Putting our Operations Level Skills to use

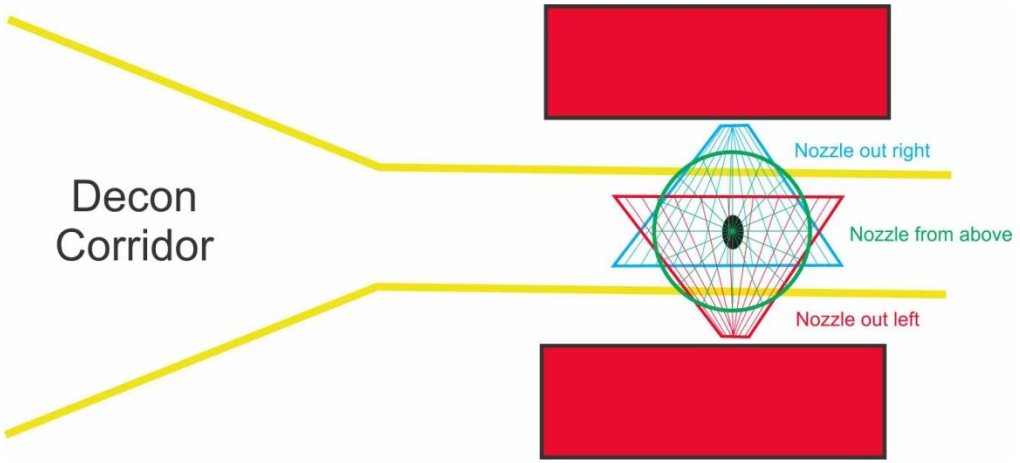
Remember our **Decontamination Methods**:

1. Rinse with Water
2. Vacuuming
3. Scrubbing or scrapping
4. Steam Jet
5. Evaporating
6. Extracting
7. Chemical detoxification
8. Disinfecting/sterilizing

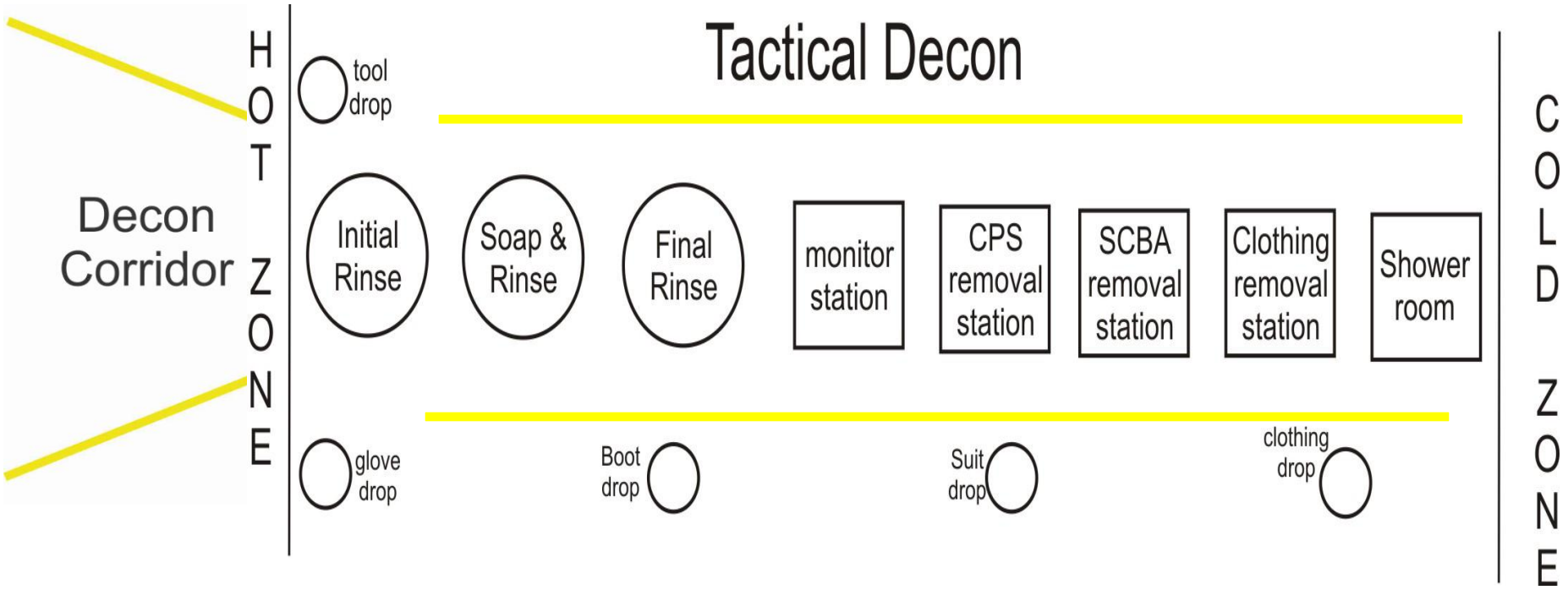
Putting our Operations Level Skills to use

In a large scale incident, with may victims needing immediate Decontaminating, a Mass Decontamination station may be required.

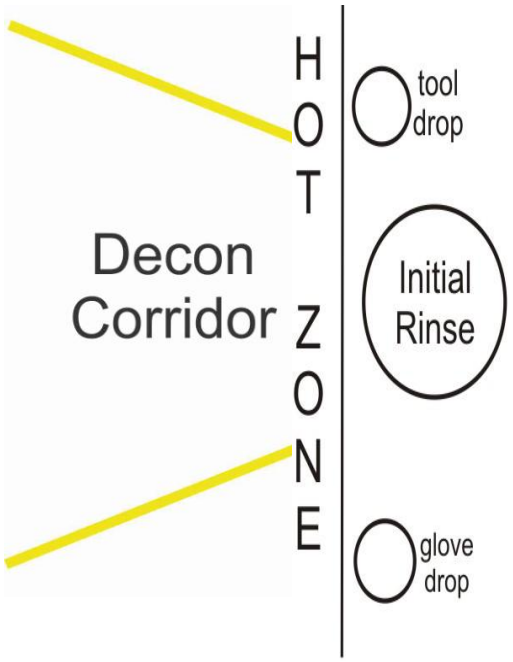
As with <u>All Decontamination Stations</u>, a defined corridor should be put into place to channel the people in, to maintain control and order, assure everyone goes through and people doesn't slip through.



Putting our Operations Level Skills to use



Putting our Operations Level Skills to use

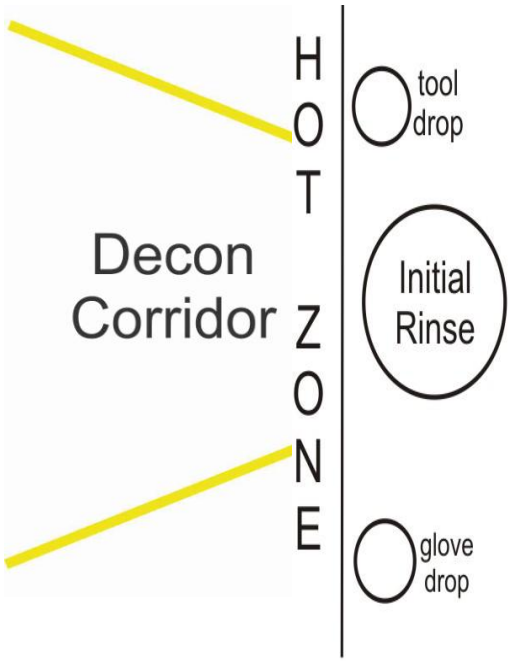


Steps in a Tactical Decon are:

- Establish a secure entry area as people exit from the **Hot zone**
- establish a drop zone for Tools/Equipment
- Level of protection in a tactical decon will be determined by the Haz-Mat Tech
  – *in most case it will be 1 level under what is required to enter the hot zone*

Level A suit to enter – Level B to decon
B to enter – C to decon …. Not 100% but typical

Putting our Operations Level Skills to use



Steps in a tactical Decon are:

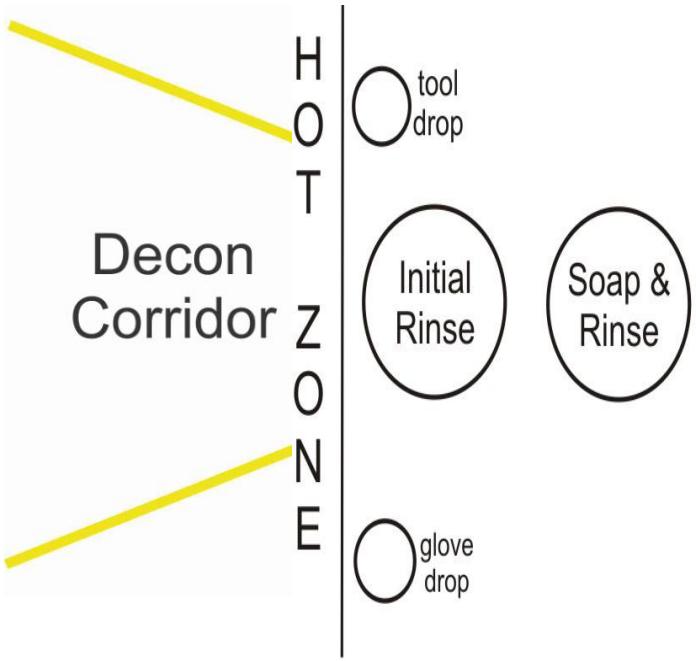
• Then we have **Initial Rinse Station** –

In a collection area (Kids Pool, Collection pool)
Remove as much contaminates as possible –

• Brushing
• Scraping
•Vacuuming
• Heavy rinse – when using water – LOTS, with little pressure (most contaminated could splash)

• Don't get fixed all decons = "**water**"…
Lye for example is a power – adding water will make more lye – vacuuming or brushing initially will be more effective before rinsing with water.

Putting our Operations Level Skills to use



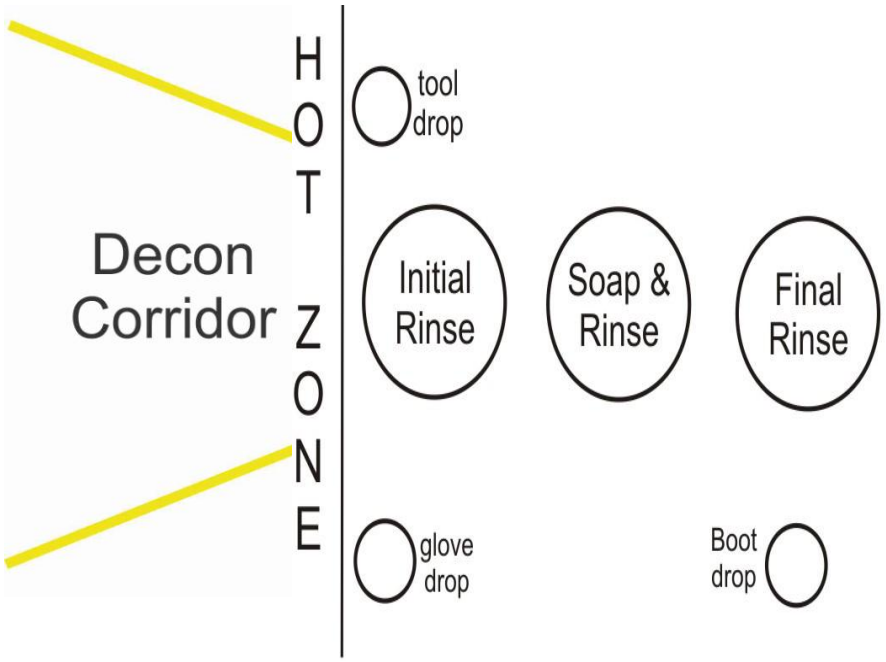
Steps in a tactical Decon are:

The next station – **Soap and Rinse:**

- At this station the contaminated will be washed from head to toe using a mild soap.
- make sure boots are done as they exit the pool

- If members is there just for a tank change, they can proceed directly to tank fill after the Soap and Rinse station.

Putting our Operations Level Skills to use



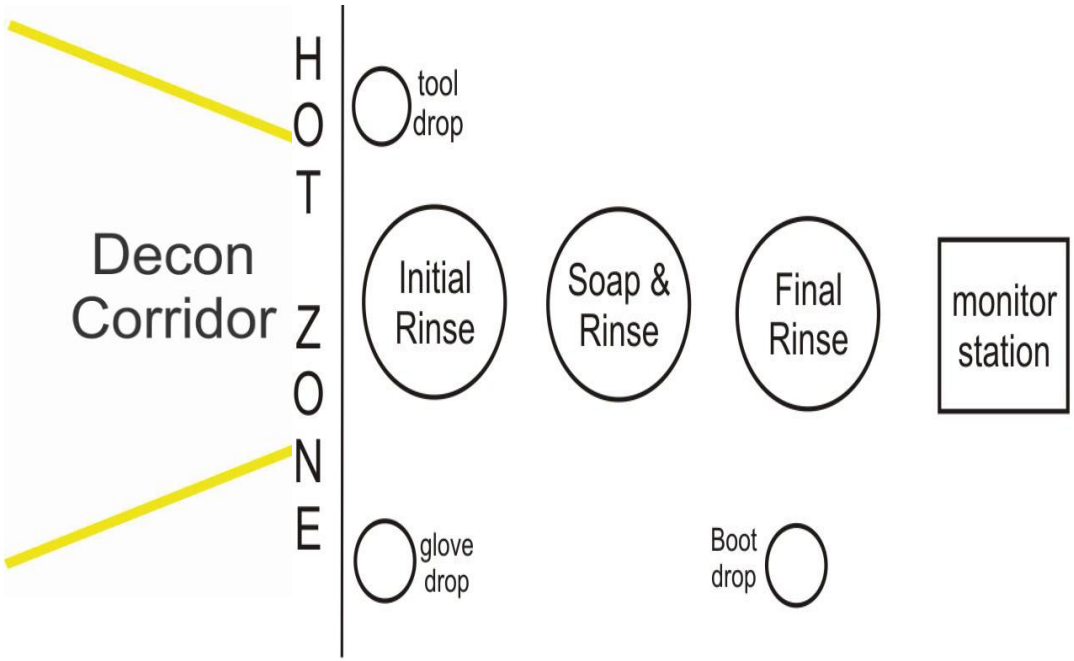
Steps in a tactical Decon are:

The next station – **Final Rinse:**

- At this station all tape, protective boots, outer gloves, will be removed and placed in a plastic bag.

- The SCBA will be removed, if worn outside suit (but mask remains on face) wearer holds SCBA in front of them as contaminated get final rinse.

Putting our Operations Level Skills to use



Steps in a tactical Decon are:
The next station – **Monitor:**

- At this station the contaminated will be checked with meters to assure they are safe to continue.

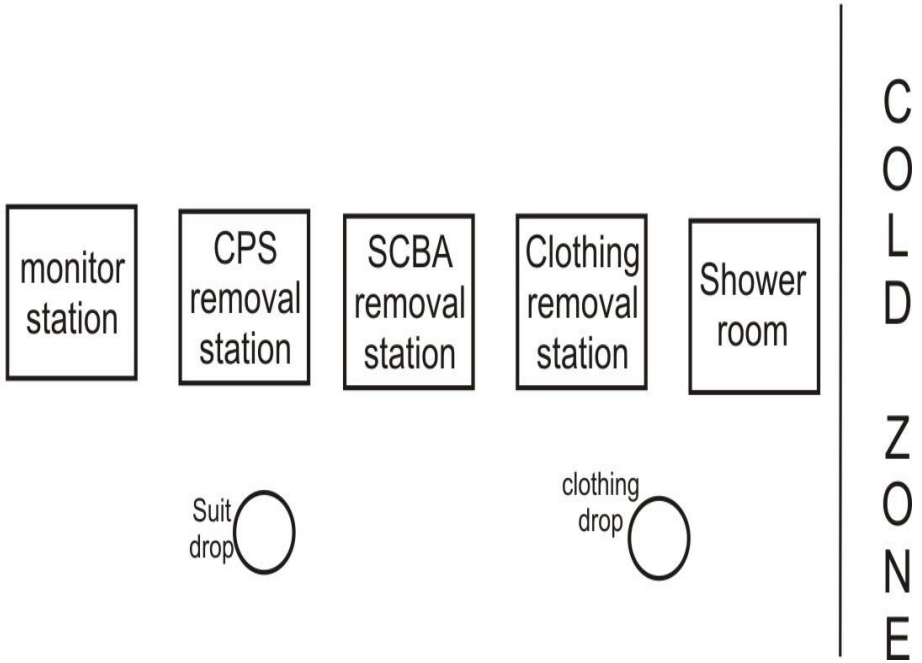
If there are not, they will go back through final rinse again and again until safe to proceed.

Putting our Operations Level Skills to use

Steps in a Tactical Decon are:

The next station – **C**hemical **P**rotective **S**uit **Removal**

- Once they are deemed safe from the monitor station their chemical protective suits can be removed and placed in the suit drop.
- The members SCBA will remain on and the will continue to hold while the CPS is removed.



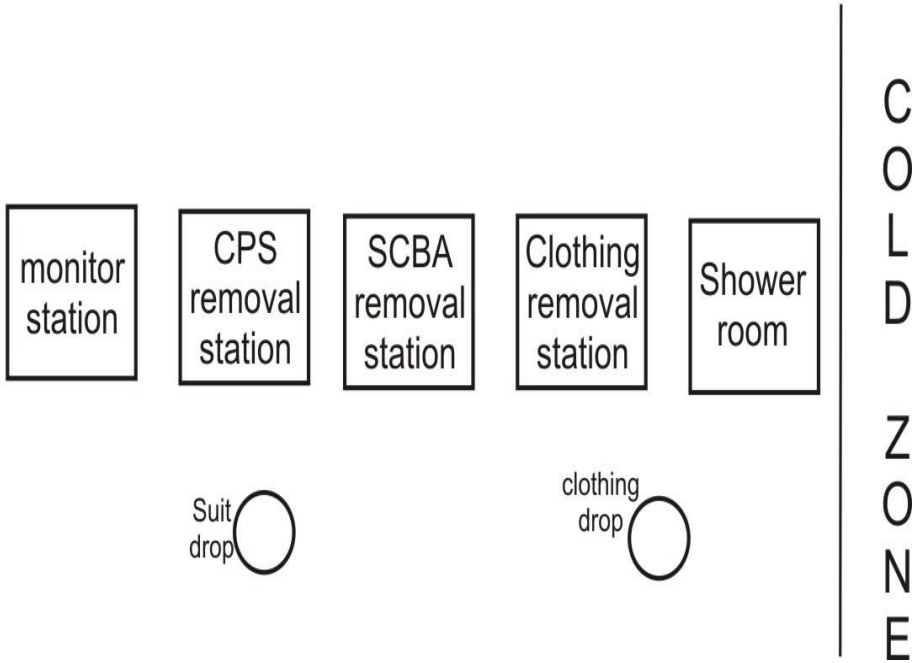
Putting our Operations Level Skills to use

Steps in a Tactical Decon are:

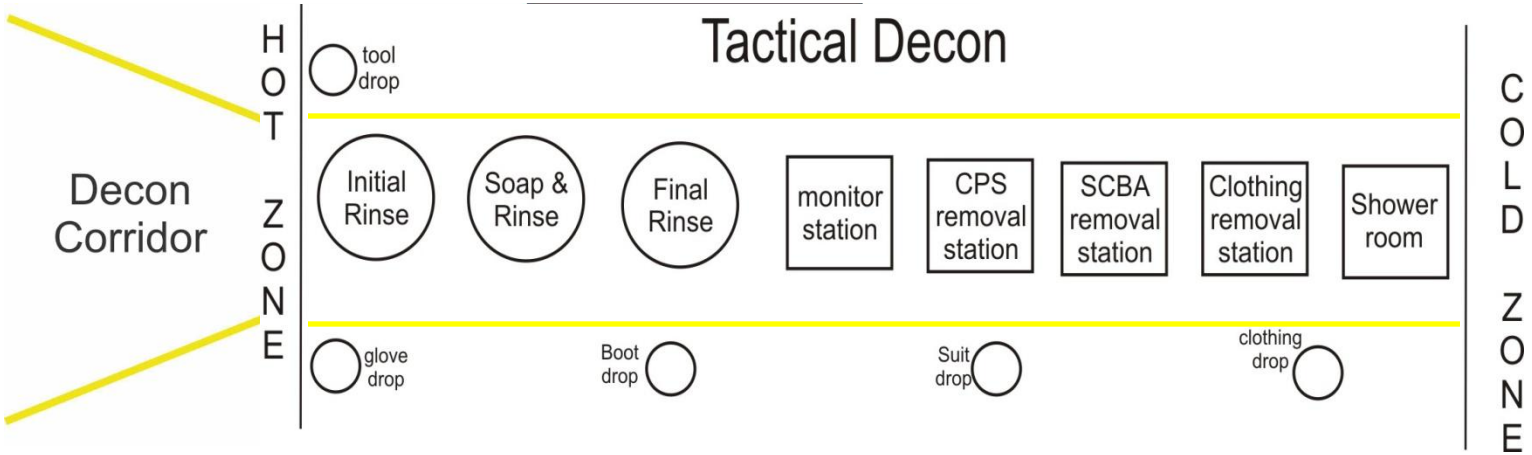
• Once the CPS is removed they can proceed to SCBA removal station where it could be removed.

•Then they move to the clothing removal station where all outer cloths will be removed and dropped in cloths drop

•Then lastly they will be required to shower before dressing for the street and enter the safe zone.



Putting our Operations Level Skills to use



We can see how labor intensive a Decon can be, all members operating in this area may be on SCBA (depending on situation) and needing decon themselves before they can exit.

At minimum, a good well trained decon team needs at least 6 people, good for about 15-20 minutes of work.

How many people can be decontaminated during that time?
How many people need to be done in the first place?
Is it just going to be the Techs/Specialists? **NO**

HOSE COMPANY 2 - WESTBURY FIRE DEPT.

ANNUAL HAZ-MAT REFRESHER

Operations Level responders have a lot of responsibility.

In review the most important things to take from this training:

We don't want to become a victim or **part of the incident** by:
- working outside our department limitations or Dept level of operation.
- as individuals - work outside our training limitations
- as an operation, work outside the limitations of our PPE

At a fire time is critical – Haz-Mat is opposite, taking a step back, accessing before committing **always** proves to be the best tactic.

HOSE COMPANY 2 - WESTBURY FIRE DEPT.

ANNUAL HAZ-MAT REFRESHER

Next step – In October

The Dept is Planning to have NYS Decon class @ Westbury FD
Followed by later that month:

We'll be setting up a drill w/ a scenario of a Haz-Mat incident where we can put this info into practical application (refreshed today material):

Chemical ID
Use of an ERG to mitigate
Recognition, Isolation, Protection and Notification
Secure, Contain, Control, Confine techniques
Meters and Monitors
Setting up a Decon station – utilizing the 9th Battalion Trailer

In mean time, remember: **THINK and STAY SAFE** !