Instructor Preparation:

The North American Emergency Response Guidebook is carried on almost every emergency vehicle in every department. All emergency response personnel should know and understand how to use it in an emergency situation. Review attached article “Making the Hazmat Refresher Fun” (July, 2016 Fire Engineering Magazine).

Goals:

The goals of this drill are:

- To increase the knowledge and memory of the responder in understanding the different color sections of the ERG.
- Improve the responder’s familiarity with the use of the ERG with information gathered from the Safety Data Sheets.
- To familiarize the responder with Safety Data Sheets from their own response area.

Materials:

- Emergency Response Guidebooks
- Whiteboard Markers
- Placards and / or Placard Charts
- Preplan Information and Safety Data Sheets (SDS) from your local community

References:

- Emergency Response Guidebook 2016
Instructor Set-up:
This is a relatively simple drill that doesn’t take much time at all to set up and involves a minimal amount of equipment.

Student Objectives:
- Describe the use of the four digit identification numbers used in the ERG.
- Describe the Yellow Section of the ERG, how it is used to identify a material, and that guide to use to handle an incident dealing with the material.
- Describe the Blue Section of the ERG, how it is used to identify a material, and what guide to use to handle an incident dealing with the material.
- Describe the Orange Section of the ERG, the purpose of the guides in this section, and how to use it on an incident.
- Identify the Green Section of the ERG, the purpose of this section, and how to use it on an incident.
- Using all the sections of the ERG the student will be able to identify how to deal with an incident dealing with a chemical release.

Drill:
1. Four Digit Identification Numbers (1-1) (The 4 Numbers in the Middle of Placard)
   A. Purpose of Numbers
      1. Internationally developed numbers used so that a user can identify the material, no matter what language they speak.
      2. Developed by the United Nations for International use.
      3. Show examples of placards found in your area.
   B. Use of Numbering System.
      1. Using slides/overheads of placards show the students how the numbering system is used to identify materials.
      2. Have the students identify locations in their first due area that they could find placards used, and what type of business it is.

2. Yellow Identification Section of Guide (1-2)
   A. Purpose of the Section
      1. Identifying hazardous materials by the four digit United Nations number on the placard or shipping papers.
      2. Identify the guide used for dealing with an incident that the number has identified.
B. Using the Yellow Section of ERG

1. Materials listed by numerical order. (Approximately 3600 chemicals)
2. More than 1 chemical may have the same Identification number.
3. Divide the class into small groups, and give each group 3-5 numbers to identify the chemical. (Examples: 1923, 2054, & 3027)
4. Give each group five to ten minutes to identify the chemical, and report their findings to the class.

3. Blue Identification Section of Guide (1-3)

A. Purpose of the Section

1. Identify the hazardous material by its proper name found on the shipping papers.
2. Identify the guide used for dealing with an incident that has the chemical name identified.

B. Using the Blue Section

1. Materials are listed alphabetically by proper chemical name. (Approximately 3600 chemicals)
2. Remind students that exact spelling of the chemical name is important. Many chemicals are spelled almost the same. (Examples: Butylamine & N-Butylaniline and 2-Chloropropane & 2-Chloropropene.)

C. Activities for students.

1. Divide the class into small groups, and give each group three to five chemicals to identify using proper chemical names. (Give group at least 1 chemical name that is close to other groups.)
2. Give each group five minutes to identify the chemicals, and report to the class their findings.
4. **Orange Section of Guide (1-4)**

   A. **Purpose of the Section.**
      1. Give the first responder on a hazardous materials incident, basic procedures for dealing with the incident.
      2. Remind the student that the information is for only protective actions, and is very generic.

   B. **Using the Orange Section of ERG**
      1. Divided into 63 different guides.
      2. Each guide is used for more than one chemical.
      3. Guides are also divided into groups dealing with specific categories of chemicals. (Examples guides 115-126 deal with compressed gases.)

   C. **Activity for students.**
      1. Divide the class into small groups and give each group three to five I.D. numbers and chemical names, and identify the proper guide to use for each.
      2. Give each group three to five to identify the proper guide, and report it to the class.

5. **Green Section of Guide (1-5)**

   A. **Purpose of the Section.**
      1. To identify suggested isolation zone for chemicals that are identified as toxic from vapors of the spilled chemical.
      2. The Initial Isolation Zone is defined as the area surrounding the incident in which people may be exposed to dangerous (upwind) and life threatening (downwind) concentrations of the material.
      3. This section also contains a list of water reactive materials, that when mixed with water will produce a large amount of toxic fumes.

   B. **Using the Green Section of ERG**
      1. Remember, when any chemical is highlighted in the Yellow or Blue section, the green section of the Guide is used.
      2. Chemicals are listed in U.N. number order in this section.
3. Review pages 294-295 in ERG for determining out initial isolation and protective action distances.

C. Activity for students.

1. Divide the class into small groups, and give each group a chemical, and have them determine the proper isolation and protective actions distances for the chemical. (Both day & night conditions, large, or small spill.)
2. Give each group five to ten minutes to develop their plan.

6. Putting all the Sections Together (1-6)

A. Review each Section.

1. Yellow Section of Guide (by ID numbers)
2. Blue Section of Guide (by proper name)
3. Orange Section of Guide (actions to take)

B. Activity for Students.

1. Divide the class into small groups, and give each group 3-5 chemicals to identify, and what actions they should take on an incident as a first responder.
2. At least one of the chemicals should be highlighted so that they must figure out an isolation, and protective action distances.
3. Give each group fifteen to twenty minutes to complete their work and report back to the class.
4. Review the problems as a class, and discuss any questions or concerns.

NOTE: The Pipeline and Hazardous Materials Safety Administration has developed a free, mobile web app of its Emergency Response Guidebook 2016 (ERG). The new safety tool provides the nation's emergency responders with fast, easily accessible information to help them manage hazardous material incidents. This software is available from the Apple iTunes store for iPhone, and from the Google Play website for Android..
Student Activity Worksheet

Ask the following questions to the group (note to instructor – you may want to print this with the right answers for your use – also there is a separate file with the graphics enlarged that you can show the class for easier viewing by them)

1. What type of *firefighting foam* should be used on a large spill fire involving the product in this highway cargo tanker? Are there *toxic effects* associated with this product?

2. What type of protective clothing should be worn to handle a spill involving *Muriatic acid*?

3. What are the recommended *extinguishing agents* for the product with this placard? What is this product?

4. What type of extinguishing agents should **NOT** be applied to fires involving *Perchloric Acid UN 1802*?

5. What are the phone numbers for CHEMTREC and the phone number for the National Response Center (NRC)?
   CHEMTREC Phone: ______________________________________________________

   NRC Phone: _________________________________
6. If a container of the material with this placard is submerged in water, what Toxic by-Inhalation (TIH) gas may be produced?

7. What toxic gases may be produced by the reaction between sulfuryl chloride and water?

8. Is UN1053 a flammable gas? What is it’s primary hazard, fire or toxicity?

9. Which guide number would you use to find response information about the railcar pictured here?

10. You have a unknown liquid leaking from a dry van trailer into a parking lot, the only placards or markings on the trailer are the two placards pictured here, what chemicals do you have and should you evacuate the area?
### Topic: ERG Review

**Level of Instruction:** In service personnel  
**Time Required:** 3 Hours

**Fire Department:** ____________________________  
**FDID:** _______  
**Parish:** ___________  
**Instructor:** _______________________________

**Number of Students:** _______  
*(from above FD only)*

### Attendance Roster

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One of the driest things we do in the fire service is our annual hazmat refresher. There are two groups of firefighters: those who say IDLH means immediately dangerous to life or health and those who say IDLH means I don’t like hazmat. Whatever group you fit into, we need to be prepared to answer the call safely and efficiently. One of the most basic tools we have for responding to a hazmat call is the Emergency Response Guidebook (ERG). Ask those who have been on the job for a while if they know the ERG, and the answer is usually, “Oh yeah.” But, do they really know it?

When asked to do a refresher, I usually get the crew in the day room, give them an ERG, and get back to basics. I tell the students that the ERG is orange on the outside because it’s our job to get to the orange on the inside.

The first subject we cover is the Table of Placards in the very front of the ERG. We all know uphill, upstream, upwind, so our safest approach is from those categories. I ask, Where are we coming from and where are we going to? What did dispatch say we had? What rig are we taking? Our safest approach is staging far enough away so that we are not in the hot zone. If we are that far away, can we see product names or numbers? Maybe all we see is the color of the placard. If that’s the case, we use the Table of Placards to identify what guide number we go to. I mention that I usually choose the lowest number in the guide just to be on the safe side. Guides go from 111 to 172, in the order of decreasing hazard. The guides are presented in a two-page format; the left page covers potential hazards. Is it safe for us to even attempt to do anything, or do we direct the endangered people to a safe area and wait on a formal hazmat team? That page is where we start, and if we can’t get past it, then we wait.

The Plan Components

The top of the guide tells us the type of material with which we are dealing. We can start to formulate a plan. On the right side is what we do for public safety and emergency response. I remind the crew that you are number one, your partner is number two, and everyone else is number three. The first things we do are identify the material, make the appropriate notifications, and then protect ourselves and others. That is where the initial isolation and evacuation distances are mentioned. After we ensure our safety and that of our citizens, we research what we are to do for decontamination for us and the victims.

Next, we go to the railcar/road trailer pages. I ask, What shape is the railcar or road trailer? What’s in it? Is it corn syrup or methyl ethyl bad stuff? What is the guide number to the trailer or railcar?
After mastering finding where to go from there, we move to the color-bordered pages: yellow for identification by UN/NA number, blue for identification by name. Easy enough, huh?

I ask the crew to look up crude oil. Everyone knows that’s hazardous. Hmmm ... silence. I ask them to look up 1267. Wow! It’s really called petroleum crude oil! (photo 1). This is a great opportunity to stress safety data sheets so they get the correct name.

After that, we look up random things; fish meal, fire extinguishers first-aid kits, London Purple, and discuss why those items are hazmat. Use your ERG to find any known products in your first-due area, and familiarize your crew with those products. You may be surprised at how much discussion on target hazards your crew comes up with. Remind your crew about the local emergency response plan and who the key players are. Let your crew come up with other resources on their own; that gives them ownership and pride in being part of the solution. You will notice the thought process coming together and the interest in coming up with real, everyday solutions that they own now and will remember.

After all of that, you will notice that the crew is actually having fun competing to find the answers to the questions you are asking. Their minds are off of thinking how dull the refresher is, and they are actually getting experience in using the ERG. There is much more to cover, but just by getting the crew “in the book” and hands on, they are interested and engaged.

**Mitigation, What Ifs**

We go to the guide pages and discuss what we have to do to mitigate a scene or anything we would need to do our job safely. Brainstorming about our wants and needs and what we can substitute for them in an emergency gets the crew thinking. What do we have for decontamination? Fancy store-bought stuff or mop buckets and truck scrub brushes? How will we get soap or bleach, and is it compatible with the product? What about runoff? Do we have kiddie pools, or can we make a catch-all with a salvage cover? (That leads to another drill.)

We go to the dry erase board or chalk board and map out protective action distances and zones (photo 2), and we talk about “what ifs.” How many people, schools, churches, businesses could be affected? What about evacuation or shelter in place? What are some evacuation routes we will tell the citizens to take? Are they trapped in an area we can’t evacuate, or are the routes leading them into harm’s way? How will we arrange for transportation for the victims? How will we notify the appropriate shelter-type building owners that we need their facilities, and will they allow us to send victims to them? An enormous amount of discussion on just that will ensue.
The next thing you know is that it has been a learning experience that we may not have realized. How much has the crew learned from the very informal training? My guess is much more than from a PowerPoint® presentation. We’ve all been in that class where all we want to do is sign the training roster and get the heck out of there. Getting the crew engaged, hands on the ERG; discussing the target hazards in our community; and fostering the camaraderie that comes from the friendly competition are priceless. When I close the drill out, I usually give them something to think about: What if it is your family who is affected by a release? How good will they think we are in mitigating a hazmat incident?

I usually end the drill with a little humor. I ask them to look up UN 3065 and tell me what to do if I accidentally ingest some of that product. I’ll leave it at that.


GRAY YOUNG, a 20-year veteran of the fire service, has worked in volunteer and career fire departments. He has been chief of training for South Bossier District Two, Louisiana, since 2002. He is the assistant manager of the Louisiana State University Fire and Emergency Training Institute. He is president of Brothers of the Boot, a F.O.O.L.S. chapter.

Photos by Dawn Young.