M E R R T
Initial Response Actions

INTRODUCTION

This module will provide you with information about the initial response actions you should take when arriving at the scene of a transportation incident involving radioactive material. You will learn how to use the U.S. Department of Transportation's Emergency Response Guidebook (ERG) and also how to isolate and control an accident scene.

You will also be able to identify medical priorities at a radioactive material transportation incident. This module should not be considered comprehensive training on how to use the ERG.

PURPOSE

The purpose of this module is to provide a basic understanding of the initial actions you should take when arriving at a scene of a radioactive material transportation incident.

Your ability to effectively identify the hazard using the ERG will enhance your efficiency in responding to the incident.

MODULE OBJECTIVES

Upon completion of this module, you will be able to:

1. Identify the actions required by "Safety, Isolation, and Notification."
2. Identify the information contained on shipping papers used for transporting radioactive material.
3. Locate, in the U.S. Department of Transportation Emergency Response Guidebook (ERG), the response guide for radioactive material by using one or all of the following: UN identification number, material name, or shipment placards.

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INITIAL RESPONSE ACTIONS

State, tribal, and local government officials are responsible for providing emergency response to any incident within their jurisdiction, including those involving radioactive material. To successfully deal with transportation incidents involving radioactive material, state, tribal, and local government officials should develop a response plan for these incidents. This plan should be developed before an incident occurs.

If an incident involving radioactive material occurs in your jurisdiction, follow your local and or state emergency response procedures. If your local agency does not have procedures in place, the U.S. Department of Energy has a TEPP Model Initial Response Procedure available.[1]

Safety, Isolation, and Notification

In order for you to effectively carry out your duties as a responder, your protection and safety should be foremost. This should always be your first operational thought at any hazardous material incident scene. A useful acronym to help remember your initial response actions is "SIN." SIN stands for:

Safety first and always
Isolate and deny entry
Notifications

[1] Information can be found on the Department of Energy's web site: http://web.em.doe.gov/otem/program.html

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1. **Safety First and Always**

   Approaching an incident involving radioactive material is not significantly different from approaching an incident involving other hazardous material. To ensure your safety, you should always attempt to approach the incident scene from upwind and upslope, trying to identify the hazard from as far away as possible, using binoculars if available. Use the ERG to determine your initial isolation distances.

   Once you've ensured your own safety at the scene, your priorities should be for rescue, life saving, first aid, and fire control. According to the ERG, all these priorities are "higher than the priority for measuring radiation levels." All of the guides covering radioactive material in the ERG state that "radiation presents minimal risk to transport workers, emergency response personnel, and the public during transportation accidents."

   If you need to enter the area to perform rescue operations, you can minimize your radiation exposure by following a few "common sense" guidelines:

   - Minimize your **time** in the incident area. The less time you spend in a radiation field, the less radiation dose you will receive.

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- Maintain a safe **distance** from radioactive material packages. Do not touch damaged packages or spilled material.
- Use other available material for **shielding** whenever possible. A vehicle between you and the radiation source can reduce your radiation exposure (e.g., ambulance, patrol car, fire pumper, etc.).

2. Isolate and Deny Entry to the Area

When responding to a transportation incident involving radioactive material, isolate the scene to reduce the potential for spreading radioactive contamination and to minimize possible radiation exposure. Guides 161 through 166 in the ERG can be used to determine initial isolation distances. These guides recommend an initial isolation of 75 feet in all directions. Responders at any hazardous material scene should keep unauthorized personnel away from the area and always try to position themselves uphill, upwind, and upstream of the incident.

If life saving, first aid, or control of fire is not necessary at an incident scene, there is no need for a responder to enter the area. Avoid the urge to go in and "look around." Once the area is isolated, deny entry and wait for members of the hazardous material response team, state radiological control, or other trained personnel to arrive.

Once the area is isolated, try to identify the material involved in the incident; you can refer to the ERG to help identify the material and determine the appropriate immediate steps to take. An overview of the ERG is included in this module.

3. Begin the Notification Process

When a hazardous material incident of any kind occurs, notify the proper agencies and personnel as soon as possible. Most states have a radiological health agency. The state radiological health agency may be able to provide additional assistance/ resources for a radioactive material related incident. The agency can either provide specialized assistance, or identify other available resources. If you are the first person to arrive on the scene of a radioactive material incident, follow your state or local notification procedure. Your local notification procedure may be similar to this:

Call Dispatch/911

- Ask dispatch to make any other necessary contacts, including:
  - Other local personnel that may be needed
  - State radiological agency
  - Neighboring jurisdictions that may be affected

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- Include the following information in your notification to dispatch:
  - Your name, agency, and call-back number
  - Radioactive material(s) involved, and type(s) of package(s)
  - Severity of the incident (injuries, breached packages)
  - Incident location
  - Actions already taken
  - On-scene contact (Incident Commander), and how to reach this person
  - How the incident occurred
  - Carrier, shipper, and receiver information (from shipping papers or packages)

- Contact the emergency response telephone number listed on the shipping papers.

- Other notifications: this varies with each organization.

Shipping Papers

The driver of the transport vehicle, if available, can be a valuable source of information about the nature of the material being transported. The driver may also be of assistance when retrieving the shipping papers. The shipping papers contain valuable information on the material being transported. They include the name, address, and telephone number for both the shipper and receiver and contain specific information on the nature of the radioactive contents.

The shipping papers must provide an emergency response telephone number, including the area code or international access code, for use in the event of an emergency involving the material. The person answering the phone must be knowledgeable of the material and mitigation actions to be taken, or must have immediate access to a person who has the required knowledge.

Shipping papers are required for all modes of transport. Drivers of motor vehicles transporting hazardous material are required to have shipping papers readily available to response personnel. A vehicle's

shipping papers are usually found in a holder mounted on the inside of the driver's side door, or within arm's reach of the driver. When the driver is not in the vehicle, the shipping papers must be placed on the driver's seat. Though shipping papers are important, they should not be retrieved at the expense of safety. No responder should compromise their own safety to retrieve shipping papers.

If you can retrieve shipping papers without significant risk, you should do so at the earliest opportunity. Information found on shipping papers that is specific to radioactive material includes:

- Identity of each material/radionuclide (e.g., Mo-99, Tl-201, I-123)
- Physical and chemical form of each material (e.g., salt/solid)
- The amount of radioactivity contained in each package
- Category of label applied to each package (e.g., Radioactive Yellow-II)
- Assigned transport index for each package (applies to Yellow-II and Yellow-III labels only)
- Fissile controls information[2] (if applicable)

Depending on the mode of transport, shipping papers may be located in any of the following places:

- In the cab of the motor vehicle
- In the possession of a train crew member
- In a holder on the bridge of a vessel
- In the possession of an aircraft's pilot

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[2] Applies to material labeled as FISSILE. These materials have the capability of undergoing fission (splitting of atom's nucleus) and thus require controls to assure nuclear criticality safety during transport.

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Handling Potentially Contaminated Shipping Papers

If you suspect that the shipping papers are contaminated, the following steps can be used to prevent the spread of contamination when removing shipping papers from the hot zone.

In the hot zone, and with the protection of appropriate Personal Protective Equipment (PPE):

- Separate each page
- Carefully wipe off any liquid or other material from the shipping papers' surfaces
- Place each page into a separate plastic bag. (Clear food storage bags work well; they lay flat and are large enough to hold a flat 8.5" x 11" sheet)
- Pass bags through the decontamination line and decontaminate (decon) the outside of each bag by wiping it off
- In the clean zone, place another plastic bag over the outside of the original bag
- Handle the documents carefully until they can be monitored for contamination. If possible, make photocopies of the documents (through the bags) and place the originals in a safe location

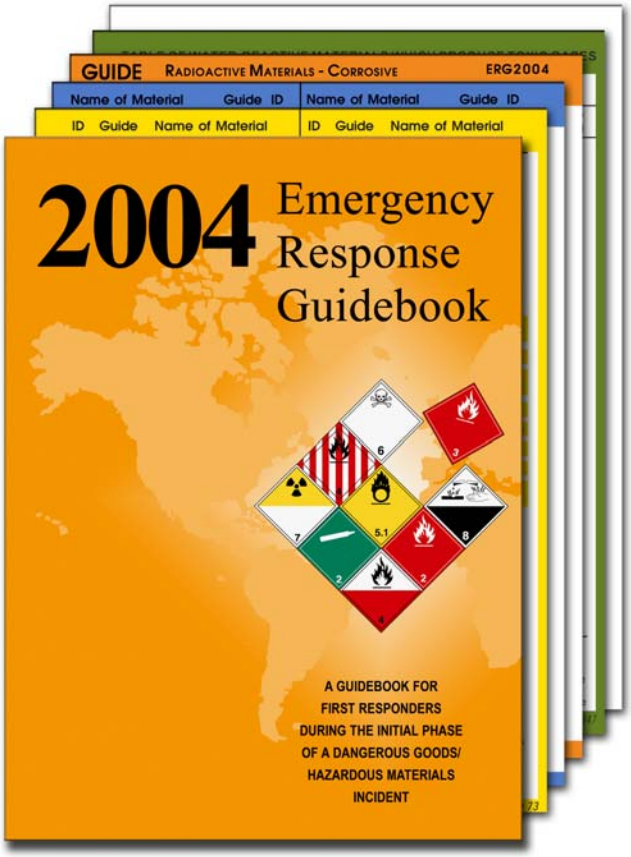
EMERGENCY RESPONSE GUIDEBOOK (ERG) OVERVIEW

The ERG provides guidelines for responders to use for commonly transported hazardous material, including radioactive material. The guides for radioactive material are numbered 161-166.

Remember that the ERG is only a guidebook and should not take precedence over local standard operating procedures.

The ERG is intended to help you make informed decisions about the type of hazards involved and the initial precautions to take. To use the ERG effectively, you should become familiar with the ERG **prior** to an emergency.

The guidebook lists the four-digit United Nations Identification Number (UN ID) used on shipping papers, package markings and some placards as well as the Proper Shipping Names of hazardous material. Each hazard has a guide and precautions designed to protect responders from harm. The guidebook also lists common placards used in the transportation of hazardous material.



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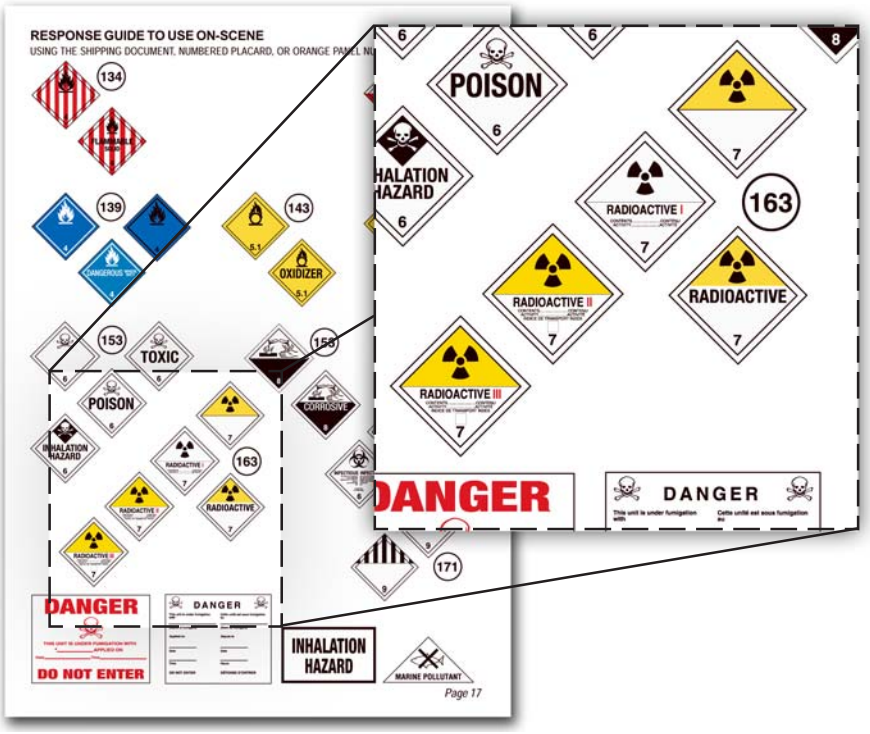
Overview of color-coded sections:
The initial section is **white** and contains general guidelines for any hazardous material situation. It addresses safety precautions and who to call for assistance. The initial white section also contains the "table of placards and initial response guides." The table of placards displays the placards used on transport vehicles carrying dangerous goods.

You can refer to the table of placards and initial response guides if you respond to an incident involving placarded material but are unsure of what material is represented by the placard. Match the vehicle placard(s) with one of the placards displayed on the table of placards. A numbered guide is located next to each placard in the table and is shown as a circled number next to each placard. Use this guide number until the hazardous material involved can be specifically identified.

For radioactive material, package labels and placards used on shipments are shown in the table of placards. As the detail below illustrates, if you see a radioactive label or placard pictured and have no other information, you can determine which guide number to use (Guide 163) by looking at the circled number next to the radioactive label and placard on the table (*see example below*).



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The **yellow** section shows, in numerical order, the four-digit UN ID number assigned to each hazardous material. By looking up the UN ID number, you can find the appropriate guide number and name of the hazardous material. For example, if you were looking up UN ID number 2977, you would find that the name of the material is "Radioactive material, Uranium hexafluoride, fissile" and that the guide number is 166 (*See below*).

ID No.	Guide No.	Name of Material
2966	153	Thioglycol
2967	154	Sulfamic acid
2967	154	Sulphamic acid
2968	135	Maneb, stabilized
2968	135	Maneb preparation, stabilized
2969	171	Castor beans, meal, pomace or flake
2974	164	Radioactive material, special form, n.o.s.
2975	162	Thorium metal, pyrophoric
2976	162	Thorium nitrate, solid
2977	166	Radioactive material, Uranium hexafluoride, fissile
2977	166	Uranium hexafluoride, fissile containing more than 1% Uranium-235
2978	166	Radioactive material, Uranium hexafluoride
2978	166	Radioactive material, Uranium hexafluoride, non-fissile or fissile-excepted
2978	166	Uranium hexafluoride
2978	166	Uranium hexafluoride, fissile-excepted
2978	166	Uranium hexafluoride, low specific activity
2978	166	Uranium hexafluoride, non-fissile
2979	162	Uranium metal, pyrophoric
2980	162	Uranium nitrate, hexahydrate, solution
2980	162	Uranyl nitrate, hexahydrate, solution
2981	162	Uranyl nitrate, solid
2982	163	Radioactive material, n.o.s.
2983	129P	Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide
2983	129P	Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide
2984	140	Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide
2985	155	Chlorosilanes, flammable, corrosive, n.o.s.
2985	155	Chlorosilanes, n.o.s.
2986	155	Chlorosilanes, corrosive, flammable, n.o.s.
2986	155	Chlorosilanes, n.o.s.
2987	156	Chlorosilanes, corrosive, n.o.s.
2987	156	Chlorosilanes, n.o.s.
2988	139	Chlorosilanes, n.o.s.
2988	139	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.
2989	133	Lead phosphite, dibasic
2990	171	Life-saving appliances, self-inflating
2991	131	Carbamate pesticide, liquid, poisonous, flammable
2991	131	Carbamate pesticide, liquid, toxic, flammable
2992	151	Carbamate pesticide, liquid, poisonous
2992	151	Carbamate pesticide, liquid, toxic
2993	131	Arsenical pesticide, liquid, poisonous, flammable
2993	131	Arsenical pesticide, liquid, toxic, flammable

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The **blue** section alphabetically lists each hazardous material by Proper Shipping Name. By looking up the name of the material in this section, you can locate the appropriate guide number and UN ID number for it. For example, if you look up "Radioactive material, Uranium hexafluoride, fissile" you find, again, that the Guide number is 166 and that the UN ID number is 2977 (*See below*).

Name of Material	Guide No.	ID No.
Radioactive material, low specific activity (LSA-II), fissile	165	3324
Radioactive material, low specific activity (LSA-III)	162	3322
Radioactive material, low specific activity (LSA-III), fissile	165	3325
Radioactive material, n.o.s.	163	2982
Radioactive material, special form, n.o.s.	164	2974
Radioactive material, surface contaminated objects (SCO)	162	2913
Radioactive material, surface contaminated objects (SCO-I)	162	2913
Radioactive material, surface contaminated objects (SCO-I), fissile	165	3326
Radioactive material, surface contaminated objects (SCO-II)	162	2913
Radioactive material, surface contaminated objects (SCO-II), fissile	165	3326
Radioactive material, transported under special arrangement	163	2919
Radioactive material, transported under special arrangement, fissile	165	3331
Radioactive material, Type A package	163	2915
Radioactive material, Type A package, fissile	165	3327
Radioactive material, Type A package, special form	164	3332
Radioactive material, Type A package, special form, fissile	165	3333
Radioactive material, Type B(M) package	163	2917
Radioactive material, Type B(M) package, fissile	165	3329
Radioactive material, Type B(U) package	163	2916
Radioactive material, Type B(U) package, fissile	165	3328
Radioactive material, Type C package	163	3323
Radioactive material, Type C package, fissile	165	3330
Radioactive material, Uranium hexafluoride, fissile	166	2977
Radioactive material, Uranium hexafluoride	166	2978
Radioactive material, Uranium hexafluoride, non-fissile or fissile-excepted	166	2978
Rags, oily	133	1856
Rare gases and Nitrogen mixture	121	1981
Rare gases and Nitrogen mixture, compressed	121	1981
Rare gases and Oxygen mixture	121	1980
Rare gases and Oxygen mixture, compressed	121	1980
Rare gases mixture	121	1979
Rare gases mixture, compressed	121	1979
Receptacles, small, containing gas	115	2037
Red phosphorus	133	1338
Red phosphorus, amorphous	133	1338
Refrigerant gas, n.o.s.	126	1078
Refrigerant gas, n.o.s. (flammable)	115	1954
Refrigerant gas R-12	126	1028
Refrigerant gas R-12 and Refrigerant gas R-152a azeotropic mixture with 74% Refrigerant gas R-12	126	2602

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The **orange** section contains the guides for dealing with each material. These guides list the precautions to take for each hazardous material. The guides identify potential hazards (health, and fire or explosion) and emergency actions (initial, fire, spill or leak, and first aid) associated with each material. Each guide is two pages. Guide 166 is shown below and on the following page.

GUIDE 166 — RADIOACTIVE MATERIALS - CORROSIVE (URANIUM HEXAFLUORIDE/WATER-SENSITIVE) — ERG2004

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential radiation and criticality hazards of the content increase.
- Chemical hazard greatly exceeds radiation hazard.
- Substance reacts with water and water vapor in air to form toxic and corrosive hydrogen fluoride gas and an extremely irritating and corrosive, white-colored, water-soluble residue.
- If inhaled, may be fatal.
- Direct contact causes burns to skin, eyes, and respiratory tract.
- Low-level radioactive material; very low radiation hazard to people.
- Runoff from control of cargo fire may cause low-level pollution.

FIRE OR EXPLOSION

- Substance does not burn. • The material may react violently with fuels.
- Containers in protective overpacks (horizontal cylindrical shape with short legs for tie-downs), are identified with "AF", "B(U)F" or "H(U)" on shipping papers or by markings on the overpacks. They are designed and evaluated to withstand severe conditions including total engulfment in flames at temperatures of 800°C (1475°F).
- Bare filled cylinders, identified with UN2978 as part of the marking (may also be marked H(U) or H(M)), may rupture in heat of engulfing fire; bare empty (except for residue) cylinders will not rupture in fires.
- Radioactivity does not change flammability or other properties of materials.

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.**
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. • Stay upwind. • Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Large Spill

- See the Table of Initial Isolation and Protective Action Distances.

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

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Page 2 of Guide 166 lists the emergency actions for fire, spill or leak, and first aid.

ERG2004

RADIOACTIVE MATERIALS - CORROSIVE
(URANIUM HEXAFLUORIDE/WATER-SENSITIVE)

GUIDE 166

EMERGENCY RESPONSE

FIRE

- DO NOT USE WATER OR FOAM ON MATERIAL ITSELF.
- Move containers from fire area if you can do it without risk.

Small Fires

- Dry chemical or CO_2.

Large Fires

- Water spray, fog or regular foam.
- Cool containers with flooding quantities of water until well after fire is out.
- If this is impossible, withdraw from area and let fire burn.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Do not touch damaged packages or spilled material.
- Without fire or smoke, leak will be evident by visible and irritating vapors and residue forming at the point of release.
- Use fine water spray to reduce vapors; do not put water directly on point of material release from container.
- Residue buildup may self-seal small leaks.
- Dike far ahead of spill to collect runoff water.

FIRST AID

- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.
- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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The **green** section contains the table of initial isolation and protective action distances. These distances are useful for protecting people from vapors resulting from spills considered poisonous or toxic if inhaled. If you find an index entry is highlighted in the yellow or blue sections, look for the UN ID number and name of the material in the table of initial isolation and protective action distances. If necessary, begin protective actions immediately.

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)
2929	Toxic liquid, flammable, organic, n.o.s. (Inhalation Hazard Zone B)	60 m	(200 ft)	0.4 km	(0.2 mi)	1.0 km	(0.6 mi)	270 m	(900 ft)	2.5 km	(1.6 mi)	5.6 km	(3.5 mi)
2977	Radioactive material, Uranium hexafluoride, fissile **(when spilled in water)**	30 m	(100 ft)	0.1 km	(0.1 mi)	0.6 km	(0.4 mi)	90 m	(300 ft)	0.7 km	(0.5 mi)	3.3 km	(2.1 mi)
2977	Uranium hexafluoride, fissile containing more than 1% Uranium-235 **(when spilled in water)**												
2978	Radioactive material, Uranium hexafluoride **(when spilled in water)**	30 m	(100 ft)	0.1 km	(0.1 mi)	0.6 km	(0.4 mi)	90 m	(300 ft)	0.7 km	(0.5 mi)	3.3 km	(2.1 mi)
2978	Radioactive material, Uranium hexafluoride, non-fissile or fissile-excepted **(when spilled in water)**												
2978	Uranium hexafluoride **(when spilled in water)**												
2978	Uranium hexafluoride, fissile-excepted **(when spilled in water)**												
2978	Uranium hexafluoride, low specific activity **(when spilled in water)**												
2978	Uranium hexafluoride, non-fissile **(when spilled in water)**												
2985	Chlorosilanes, flammable, corrosive, n.o.s. **(when spilled in water)**	30 m	(100 ft)	0.1 km	(0.1 mi)	0.5 km	(0.3 mi)	150 m	(500 ft)	1.3 km	(0.8 mi)	3.9 km	(2.4 mi)
2985	Chlorosilanes, n.o.s. **(when spilled in water)**												

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Additionally, If the words "(when spilled in water)" also appear in conjunction with the material listed in the green section, this is an indication that the material is water reactive and is listed at the end of the green section in the "Table of Water-Reactive Materials Which Produce Toxic Gasses" section. Uranium Hexafluoride, for example, is listed in the "Table of Water-Reactive Materials Which Produce Toxic Gasses" section as a material which produces hydrogen fluoride gas when spilled in water.

TABLE OF WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH) Gas(es) *When Spilled in Water*

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
2004	135	Magnesium diamide	NH_3
2011	139	Magnesium phosphide	PH_3
2012	139	Potassium phosphide	PH_3
2013	139	Strontium phosphide	PH_3
2437	156	Methylphenyldichlorosilane	HCl
2495	144	Iodine pentafluoride	HF
2691	137	Phosphorus pentabromide	HBr
2692	157	Boron tribromide	HBr
2806	138	Lithium nitride	NH_3
2977	166	Radioactive material, Uranium hexafluoride, fissile	HF
2977	166	Uranium hexafluoride, fissile containing more than 1% Uranium-235	HF
2978	166	Radioactive material, Uranium hexafluoride	HF
2978	166	Radioactive material, Uranium hexafluoride, non-fissile or fissile-excepted	HF
2978	166	Uranium hexafluoride	HF
2978	166	Uranium hexafluoride, fissile-excepted	HF
2978	166	Uranium hexafluoride, low specific activity	HF
2978	166	Uranium hexafluoride, non-fissile	HF
2985	155	Chlorosilanes, flammable, corrosive, n.o.s.	HCl
2985	155	Chlorosilanes, n.o.s.	HCl
2986	155	Chlorosilanes, corrosive, flammable, n.o.s.	HCl
2986	155	Chlorosilanes, n.o.s.	HCl
2987	156	Chlorosilanes, corrosive, n.o.s.	HCl
2987	156	Chlorosilanes, n.o.s.	HCl

Chemical Symbols for TIH Gases:

Br_2	Bromine	HF	Hydrogen fluoride	PH_3	Phosphine
Cl_2	Chlorine	HI	Hydrogen iodide	SO_2	Sulfur dioxide
HBr	Hydrogen bromide	H_2S	Hydrogen sulfide	SO_2	Sulphur dioxide
HCl	Hydrogen chloride	H_2S	Hydrogen sulphide	SO_3	Sulfur trioxide
HCN	Hydrogen cyanide	NH_3	Ammonia	SO_3	Sulphur trioxide

Use this list only when material is spilled in water. *Page 347*

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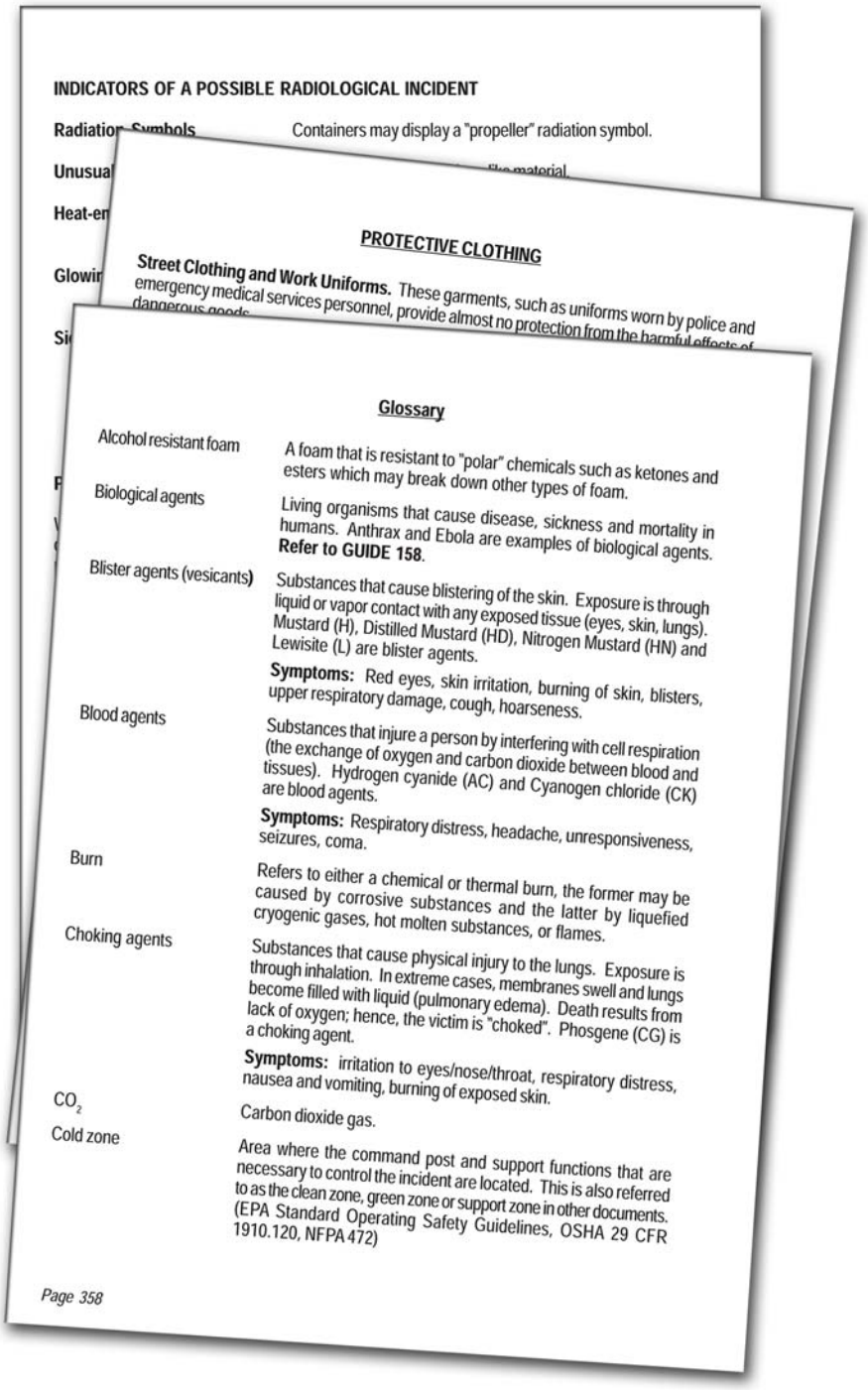
The final white section contains information on protective clothing as well as fire and spill control methods. Also included is information about criminal/terrorist use of chemical/biological/radiological agents including the differences between a chemical and a biological agent, indicators of a possible chemical incident, indicators of a possible biological incident, indicators of a possible radiological incident, personal safety considerations, and decontamination measures. The final white section also contains a glossary of terms.



INDICATORS OF A POSSIBLE RADIOLOGICAL INCIDENT

Radiation Symbols — Containers may display a "propeller" radiation symbol.

Unusual

Heat-en

Glowin

Si

PROTECTIVE CLOTHING

Street Clothing and Work Uniforms. These garments, such as uniforms worn by police and emergency medical services personnel, provide almost no protection from the harmful effects of dangerous goods.

Glossary

Alcohol resistant foam	A foam that is resistant to "polar" chemicals such as ketones and esters which may break down other types of foam.
Biological agents	Living organisms that cause disease, sickness and mortality in humans. Anthrax and Ebola are examples of biological agents. **Refer to GUIDE 158.**
Blister agents (vesicants)	Substances that cause blistering of the skin. Exposure is through liquid or vapor contact with any exposed tissue (eyes, skin, lungs). Mustard (H), Distilled Mustard (HD), Nitrogen Mustard (HN) and Lewisite (L) are blister agents. **Symptoms:** Red eyes, skin irritation, burning of skin, blisters, upper respiratory damage, cough, hoarseness.
Blood agents	Substances that injure a person by interfering with cell respiration (the exchange of oxygen and carbon dioxide between blood and tissues). Hydrogen cyanide (AC) and Cyanogen chloride (CK) are blood agents. **Symptoms:** Respiratory distress, headache, unresponsiveness, seizures, coma.
Burn	Refers to either a chemical or thermal burn, the former may be caused by corrosive substances and the latter by liquefied cryogenic gases, hot molten substances, or flames.
Choking agents	Substances that cause physical injury to the lungs. Exposure is through inhalation. In extreme cases, membranes swell and lungs become filled with liquid (pulmonary edema). Death results from lack of oxygen; hence, the victim is "choked". Phosgene (CG) is a choking agent. **Symptoms:** irritation to eyes/nose/throat, respiratory distress, nausea and vomiting, burning of exposed skin.
CO_2	Carbon dioxide gas.
Cold zone	Area where the command post and support functions that are necessary to control the incident are located. This is also referred to as the clean zone, green zone or support zone in other documents. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472)

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notes

Check Your Understanding

1. A useful acronym to help remember your initial response actions is SIN. The acronym stands for _____, _____, and _____.

2. When approaching the scene, you should attempt to identify the hazard from as far away as possible, using _____ if available.

3. If the responder at the scene of a transportation accident sees a placarded vehicle but does not know what material is represented by the placard, what section of the ERG should be consulted?
   a) The yellow section
   b) The green section
   c) The initial white section
   d) The orange guide pages

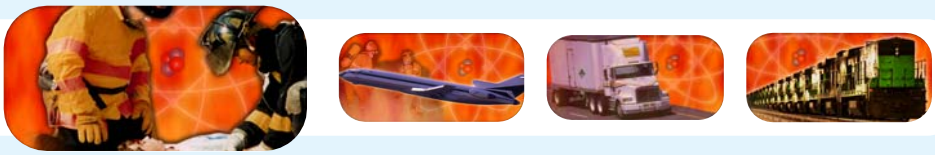
4. Which section of the ERG lists, in numerical order, UN Identification Numbers?
   a) The yellow section
   b) The green section
   c) The initial white section
   d) The orange guide pages

5. The _____ section of the ERG contains the guides to handling each material.

6. The guides for radioactive material recommend an initial isolation of ___ feet in all directions.

7. According to the ERG, _____ _____ should always take priority over radiological concerns at a radioactive material incident.

M E R R T T



ANSWERS

1. safety
   isolation
   notification
2. binoculars
3. c
4. a
5. orange
6. 75
7. medical
   problems