

# *Federal Emergency Management Agency Your Guide to Disaster Preparedness*

## **Are You Ready?**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
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*Why prepare for disaster?*

Every day, millions of people wake up, go to work, take kids to school, farm their land or go to ball games. But every so often, the unexpected will happen: an earthquake, a fire, a chemical spill on the highway or some other emergency. Routines change drastically, and people are suddenly aware of how fragile their lives can be.

Disasters make national headlines, but most emergencies that seriously affect cities, towns and rural communities do not get this kind of publicity - even though hundreds of thousands of lives are disrupted every year. And each disaster has lasting effects, people are seriously injured, sometimes killed, and property damage runs into the billions of dollars.

Families who are prepared can reduce the fear, inconvenience and losses that surround a disaster. They can be ready to evacuate their homes, make their stays in public shelters more comfortable and know how to take care of their basic medical needs. They can even save each other's lives.

If a disaster threatens your community, local government and disaster-relief organizations will try to help you. But you need to be prepared as well. Local officials may be overwhelmed after a major disaster, and emergency response personnel may not be able to reach you right away. What you do to prepare can make a difference. After most disasters, you and your family should be ready to be self-sufficient for at least three days. This may mean providing for your own shelter, first aid, food, water and sanitation.

This guide can help. It was developed by the Federal Emergency Management Agency (FEMA), the agency responsible for the nation's emergency preparedness and for helping state and local governments and individuals prepare for emergencies. This handbook will help you learn basic steps to take in case of natural disasters (such as floods or tornadoes), man-made disasters (such as a nuclear power plant incident or industrial fire) and national security emergencies (such as an attack on the country).

Share this handbook with your family. In order to be self-reliant during the initial stages of a disaster, everyone, including children, needs to cooperate and help each other out. Teach children where to go, what to expect and how to behave in case of an emergency. Preparing does not have to be a scary experience.

This guide focuses on the physical hazards of disasters, but you should not ignore the emotional effect of losing a home, treasured possessions or a loved one. Disaster victims can become irritable, fatigued, hyperactive, angry and withdrawn. Children and older adults are especially vulnerable to disaster's psychological effects. Many older people find it particularly difficult to rebuild their lives, and children's fears can be longlasting. Don't be afraid to seek help and take care of the emotional consequences of a disaster.

### **What you should do**

First, contact your local civil defense or emergency management office to find out what disasters could strike your community. You may be aware of some of them, but others may surprise you. Then, refer to the appropriate chapters in this handbook. Each chapter covers

specific hazards, describing preventive measures and emergency steps to take once the disaster is underway.

Next, review the [Evacuation](#), [Shelter](#) and [Emergency Planning and Checklist](#) chapters. The information in these chapters applies to most disasters and emergencies and will be useful in case you do not find a separate chapter on a specific hazard.

Use this handbook as your foundation for disaster preparedness and safety. Some of the recommended actions are general and will be supplemented by specific instructions from your local government. Since special conditions exist in every community, emergency instructions issued by local governments may be slightly different from those described in this guide. If so, follow local instructions.

Each chapter ends with a list of publications you can get to find out more about disaster planning. To find out about your community's efforts, contact your state or local emergency management office.

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## **Floods**

Flood claim an average of 263 lives every year. Flood waters only one foot deep can sweep you off your feet.

Floods are the most common and widespread of all natural hazards. Some floods develop over a period of days, but flash floods can result in raging waters in just a few minutes. Water runs off steeper ground very rapidly, causing natural drainage systems to overflow with rushing flood waters and a deadly cargo of rocks, mud, smashed trees and other debris. Mudslides are also a danger created by flood conditions.

Remember--even very small streams, gullies, creeks, culverts, dry streambeds or low-lying ground that may appear harmless in dry weather can flood.

Wherever you live, be aware of potential flooding hazards. If you live in a low-lying area, near water or downstream from a dam, you must be prepared for floods.

### **What to do before a flood**

1. Know the terms used to describe flooding conditions, which will be broadcast on radio and television:
  - o Flood forecasts mean rainfall is heavy enough to cause rivers to overflow their banks or melting snow is mixing with rainfall to produce similar effects.
  - o Flood warnings or forecasts of impending floods describe the affected river, lake or tidewater, the severity of flooding (minor, moderate or major) and when and where the flooding will begin.
  - o Flash flood watches mean heavy rains (that may cause sudden flash flooding in specified areas) are occurring or expected to occur. Understand that a flash

- flood can occur without any visible sign of rainfall in your area. Be alert to a possible emergency which will require immediate action.
- Flash flood warnings mean flash flooding is occurring or imminent along certain streams and designated areas. Move to high ground immediately
  - Also contact your local emergency management, civil defense or disaster preparedness office to learn local warning signals: know who will issue the warnings, when, how and under what circumstance they will be given and how you should respond.
2. Keep a stock of food that requires no cooking or refrigeration. Store drinking water in clean, closed containers. Electric power, gas and water services may be disrupted. Consult the [Emergency Planning and Checklist](#) chapter for recommended emergency supplies.
  3. Keep a portable, battery-operated radio and flashlights in working order; stock extra batteries. Have first aid supplies and any medicines your family may need.
  4. Find out if you live in floodprone area and what the average flood depths in your community are.
    - You may need to store materials like sandbags, plywood, plastic sheeting and lumber to protect your house from flood waters and to make quick repairs after a severe storm.
    - Contact your insurance agent, community planner or local emergency manager for information.
  5. Identify dams in your area. Be aware of what could happen if they fail. Become familiar with local emergency action plans.
  6. Learn your community's flood evacuation routes and where to find high ground. In a flash flood you may need to seek high ground on foot quickly. See [Evacuation](#) chapter for important information.
  7. Know the elevation of your property in relation to nearby streams and dams so that you will know if the flood elevations forecasted will affect your home and property. call your local emergency management office for help.
  8. Contact your insurance agent or local government to discuss flood insurance coverage. Flood losses are not covered under homeowners' insurance policies. Flood insurance is available in most communities through the National Flood Insurance Program. Get coverage now. There is a waiting period, usually five days, before Flood Insurance takes effect.

### **What to do during or after heavy rains**

1. In heavy rains, be aware especially of flash floods. If you see any possibility of a flash flood occurring, move immediately to higher ground. Do not wait for instructions to move.
2. If you are where it might flood, prepare to evacuate and to seek shelter.
3. Listen to radio and television for information and instructions from your local government and emergency managers.
4. If local authorities release flood warnings:
  - Fill your bathtub with water to ensure that you have an uncontaminated supply in case services are cut off.

- In coastal areas, board up windows or protect them with storm shutters. Tape does not protect windows from being broken.
- 5. Put sandbags or other protection in place, based on anticipated flood depths. Do not stack sandbags against the outside walls of your house to keep water out of your basement. Stack sandbags away from house walls, to prevent flood waters from reaching your home.
  - When deep flooding is likely, it is better to permit the flood waters to flow freely into the basement or flood the basement yourself with clean water, if you are sure it will be flooded anyway). This will avoid structural damage to the foundation and the house by equalizing the water pressure on the outside of the basement walls and floors. Contact authorities for guidance.
- 6. If you are advised to evacuate:
  - Secure your home before leaving. If you have time and have not received other instructions from local authorities, bring outdoor belongings--such as garbage cans, garden equipment and furniture--inside the house or tie them down securely. Move essential items and furniture to the upper floors of your house; lock doors and windows.
  - If instructed, turn off utilities at the main switches or valves. Disconnect electrical appliances, but do not touch any electrical equipment if you are wet or standing in water.
  - Make sure you have enough fuel in your car--during emergencies, filling stations may not be operating. Follow recommended evacuation routes. Do not try to find shortcuts on your own; they may be blocked.
  - Leave early enough to avoid being marooned by flooded roads. Be alert for washed-out roadways and bridges; many roads parallel streams and other drainage channels and may be swept away or covered by flood waters.
  - Tell others where you are going.
  - For more important information, see [Evacuation](#) chapter.
- 7. If you must travel during heavy rains or floods:
  - Do not drive into flooded areas. If flood waters rise around your car, abandon it and move to higher ground, if you can do so safely. You and your vehicle will be quickly swept away as flood waters rise.
  - Watch for and avoid mud slides, broken sewers or water mains, loose or downed electric wires and falling or fallen objects.
  - Stay away from streams and drainage rainstorms, especially in areas known to flood. Watch out for areas known to flood. Watch out for areas where rivers or streams may flood suddenly.
  - Under no circumstances should you try to swim or dive into the water. The currents are deadly!
  - Stay away from flooded areas-- even if it seems safe, the water may still be rising. Never try to cross a flowing stream on foot.

### **What to do after a flood**

1. Do not visit disaster areas, until authorized to do so. Flood dangers do not end when the water begins to recede.

2. If you have flood insurance and suffer a loss, notify your agent.
3. Tune in to radio and television for advice and instructions on where to obtain medical care and where to get assistance for such necessities as housing, clothes and food. Outreach programs will help you cope with the stress of the situation.
4. Do not enter your home if flood waters are over the first floor; you cannot tell whether the building is safe to enter.
5. Use battery-operated lanterns or flashlights (no oil or gas lanterns or torches) to examine buildings.
6. Flooding may have swollen doors tight. When the entrance must be forced because of swollen doors, accumulated mud or bulged floors, try to enter through a window or other opening.
7. Check with local civil defense or emergency management authorities before using any water. Water sources are often contaminated by the flood. Wells should be pumped out and the water tested by authorities before drinking.
8. Do not eat food that has come into contact with flood waters.
9. Do not handle live electrical equipment in wet areas. Have an expert check all equipment before returning it to service.
10. Ask the gas company to check your home for leaks and to turn the gas back on.
11. If your basement has flooded, pump it out gradually (about 1/3 of the water per day) to avoid damage. The walls may collapse and the floor may buckle if the basement is pumped out while the surrounding ground is still water-logged.
12. Report broken utility lines to authorities.
13. Watch out for poisonous snakes in previously flooded areas.

**For more information:**

Contact your local emergency management or civil defense office or send the order form in the back of this book to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publications. (Single copy requests only).

- Flood Emergency and Residential Repair Handbook (FIA-13). This publication provides homeowners, residential contractors, and local government officials with procedures for dealing with flood hazards and damages to homes and their contents.
- Design Manual for Retrofitting Flood-Prone Residential Structures (FEMA-114). This manual provides technical guidance and economic information on flood proof retrofitting for residential buildings. Techniques include use of flood shields, water-tight membranes, protective levees and floodwalls, elevation-in-place, and relocation. The feasibility of each technique, as affected by site conditions, construction type, and flooding characteristics is addressed.
- Elevated Residential Structures (FEMA-54). This manual contains increased information on floodplain management techniques and regulations; improvements in construction materials and practices; structure elevation techniques in coastal areas, and other relevant literature.
- Answers to Questions About the National Flood Insurance Program (FIA-2). A question and answer booklet with information about National Flood Insurance

Program.

- Guide to Flood Insurance Rate Maps (FIA-14). A guide for reading and interpreting Flood Insurance Rate Maps.
- Design Guidelines for Flood Damage Reduction (FEMA-15). This manual provides general information on flooding and how to properly design and build in flood prone areas.
- Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials (FEMA-16). This guidebook will help local governments to improve their floodplain management programs for high risk flood hazard areas.

For a detailed flood plain map of your community, contact the Federal Emergency Management Agency, Flood Map Distribution Center, 6930 (A-F) San Tomas Road, Baltimore, MD 21227-6227

The following are available by writing the National Weather Service, 1325 East West Highway, Silver Spring, MD 20910, (301)713-0090

- Flash Flood (wallet card), #77014. In Spanish, #77015
- Flood, Flash Floods, and Warnings, \*81010.

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## ***Hurricanes***

More people are moving to coastal areas of the United States, and more than 73 million people live within 50 miles of a hurricane-prone coast.

Hurricanes, also known as typhoons, are severe tropical storms with heavy rains and intense winds which blow in a large circle around a center "eye". If the eye, or storm center, passes directly overhead, there will be a lull in the wind lasting from a few minutes to half an hour. At the other side of the "eye" the winds will return rapidly to hurricane force and blow from the opposite direction.

Hurricane winds can reach well over 100 miles per hour and create a huge dome of water called a storm surge with high waves that flood the coastline. Hurricanes can also produce tornadoes and cause severe flash flooding. Every Atlantic and Gulf coastal state in the country, as well as the coastal areas of Hawaii and the Caribbean islands, are threatened by hurricanes. Hurricane season extends from the beginning of June to November.

### **What to do before a hurricane**

1. Know the advisories issued by forecasters, which describe the location, strength and movement of the hurricane:
  - A hurricane watch means hurricane conditions pose a possible threat to your area. It does not necessarily mean a hurricane will strike.
  - A hurricane warning means hurricane conditions are expected in your area

within 24 hours. Areas subject to storm surge and flooding may be evacuated on the advice of local authorities. The warnings also may include an assessment of flood danger, small craft warnings, gale warnings for the storm's periphery and recommended emergency procedures from local authorities.

2. Explore the need for flood insurance by talking to your insurance agent or local government. Much of the damage caused by hurricanes comes from flooding. If you need coverage, purchase insurance well in advance--there is normally a five-day waiting period before a policy becomes effective.
3. Be prepared for possible evacuation; review the [Evacuation](#) chapter for important information.

### **What to do during a hurricane threat**

1. Listen for hurricane warnings and preparedness instructions on radio or television newscasts.
2. When your area receives a hurricane warning, you should:
  - Follow the instructions issued by local officials
  - Cover small and large windows with boards, storm shutters or heavy tape. Wind-thrown debris and wind pressure can break windows.
  - Secure outdoor objects or bring them indoors.
  - Fuel your car. Service stations may be closed after the storm, especially if the electricity is out.
  - Ready a "disaster supplies kit" containing first-aid items, special medication, important papers, blankets, cooking equipment and a portable radio with extra batteries. See [Emergency Planning and Checklist](#) chapters for important information.
  - Secure several days' supply of water, food and clothing for everyone important--after a storm, water systems may be contaminated or damaged by the storm. Fill the bathtub to ensure a supply of safe water. Refer to the [Emergency Planning and Checklist](#) chapters for important information.
  - Stay away from coastal areas, river banks and streams until all potential flooding is past.
3. If you have a boat and your area receives a hurricane watch, moor it securely and then return to a safe place on land before the storm arrives.
4. Be prepared to evacuate if:
  - Local authorities announce an evacuation.
  - You live in a mobile home or temporary structure--they are particularly hazardous during hurricanes.
  - You live on the coast, on a flood plain or near a river or inland waterway.
5. When you are advised to evacuate or decide to do so on your own:
  - Travel with care, whether you are walking or driving
  - Leave early enough to avoid being marooned by such hazards such as flooded roads and fallen trees.
  - See [Evacuation](#) chapter for important information.
6. If authorities do not recommend evacuation, stay indoors during the hurricane and



- stay away from windows. Do not be fooled if there is a lull, it could be the eye of the storm and winds will pick up again. Listen to the radio or television for information.
7. Avoid using the phone except for emergencies. Local authorities need first priority on telephone lines.

### **What to do after a hurricane**

1. Remain in your shelter, until informed by local authorities that it is safe to leave.
2. Keep tuned to local radio or television stations for advice and instructions from your local government about:
  - o Medical help.
  - o Emergency housing, clothing or food assistance.
  - o Ways to help yourself and you community recover.
3. Stay away from disaster areas-- sightseers should not interrupt crucial rescue and recovery work.
4. Drive only when necessary, and be especially careful. The streets will be filled with debris and downed power lines. Roads may be weakened and collapse under the weight of a car.
5. Avoid loose or dangling power wires and report them immediately to the power company, police or fire department.
6. Report broken gas, sewer or water mains.
7. Prevent fires. Municipal water pressure may be low, making fire fighting more difficult.
8. Check refrigerated food for spoilage. Follow instructions from the local health department or agricultural extension agency.
9. Stay away from river banks and streams until all potential flooding has passed.

### **For more information:**

- ***Contact your local emergency management of civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024 ATTN: Publications, for the following publications. (Single copy requests only).***
- ***Big Bird Gets Ready for Hurricane Kit (K-68).*** This kit is designed to help children understand and prepare for possible hurricanes.
- ***Coping with Children's Reactions to Hurricane and Other Disasters (FEMA- 184) Spanish Edition (FEMA-185).*** This pamphlet is designed to help parents deal with children's fears and anxiety following a disaster.
- ***Hurricane Awareness-Action Guidelines for Senior Citizens.*** Provides hurricane safety tips with the needs of seniors in mind.
- ***Hurricane-Safety Tips for Hurricanes (L-105).*** Leaflet providing information on hurricane preparedness warnings.
- The following are available by writing to the National Weather Service, 1325 East West Highway, Silver Spring, MD 20910, (301) 713-0900
- ***Survival in a Hurricane*** (wallet card), #70027. (Spanish version #85006.)

## **Tornadoes**

Tornadoes occur in all 50 states, but the Midwest and Southeast are the most vulnerable.

Tornadoes are nature's most violent storms and in seconds, can leave an area devastated. A tornado appears as a rotating, funnel-shaped cloud, striking the ground with whirling winds which could approach 300 miles per hour. A tornado spins like a top and may sound like an airplane or train. Although tornadoes normally travel for up to 10 miles before they subside, 200-mile "tornado tracks" have been reported. Tornadoes can strike at any time of year and often accompany hurricanes. They occur most frequently during April, May and June.

### **Know the terms used to described tornado threats:**

- A tornado watch means tornadoes, severe thunderstorms, or both, are possible. Stay tuned to radio and television reports in your area.
- A tornado warning means you should take shelter immediately. A tornado has been sighted.

### **What do to before a tornado strikes**

1. Know the locations of designated shelter areas in public facilities, such a schools, public buildings and shopping centers.
2. Have emergency supplies on hand. See the [Emergency Planning and Checklist](#) chapter for recommendations.
3. Be sure everyone in your household knows in advance where to go and what to do in case of a tornado warning.
4. If you live in a single-family house in a tornado-prone area, reinforce an interior room to use as a shelter--basement, storm cellar or a closet on the lower level of your house.
5. Make an inventory of your household furnishings and other possessions. Supplement the written inventory with photographs. Keep inventories and photos in a safe deposit box or some other safe place away from the premises.

### **What to do during a tornado watch**

1. Whenever severe thunderstorms threaten your area, listen to radio and television newscasts for the latest information and instructions.
2. Watch the horizon. If you see any revolving funnel-shaped clouds, report them immediately by telephone to your local police department or sheriff's office or dial 911. Remember that tornadoes can develop rapidly.

### **What to do during a tornado**

1. When a tornado has been sighted, stay away from windows, doors and outside walls.

Protect your head from falling objects or flying debris. Take cover immediately, wherever you are:

- In a house or small building, go to the basement or storm cellar. If there is no basement, go to an interior part of the structure on the lower level (closets, interior hallways.) In either case, get under something sturdy (such as a heavy table) and stay there until the danger has passed.
  - In a school, nursing home, hospital, factory or shopping center, go to predesignated shelter areas. Interior hallways on the lowest floor are usually safest. Stay away from windows and open spaces. Cooperate with the staff and authorities--they have had training about how to deal with emergencies.
  - In a high-rise building, go to small, interior rooms or hallways on the lowest floor possible.
  - In a vehicle, trailer or mobile home, get out immediately and go to a more substantial structure.
  - If there is no shelter nearby, lie flat in the nearest ditch, ravine or culvert with your hands shielding your head.
2. Do not attempt to flee from a tornado in a car or other vehicle. They are no match for the swift, erratic movement of these storms.

### **What to do after a tornado**

1. Use great caution when entering a building damaged from high winds. When entering or cleaning a tornado-damaged building, be sure that walls, ceiling and roof are in place and that the structure rests firmly on the foundation.
2. Look out for broken glass and downed power lines.
3. Check for injuries. Do not attempt to move seriously injured persons unless they are in immediate danger of death or further injury. If you must move an unconscious person, first stabilize the neck and back, then call for help immediately.
  - If the victim is not breathing but has good pupil reflex, carefully position the victim for artificial respiration, clear the airway and commence mouth-to-mouth resuscitation.
  - Maintain body temperature with blankets. Be sure the victim does not become overheated.
  - Never try to feed liquids to an unconscious person

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## ***Lightning***

Lightning is a serious hazard during thunderstorms and tornadoes. Take these special precautions if you are threatened by lightning.

1. When a thunderstorm threatens, get inside a home, large building or car (not a convertible).
2. Inside a home, avoid using the telephone, except for emergencies. Also, avoid bathtubs, water faucets and sinks because metal pipes can conduct

electricity.

3. If outside, with no time to reach a safe building, or an automobile, follow these rules:
  - Do not stand underneath a natural lightning rod, such as a tall, isolated tree in an open area.
  - Do not stand on a hilltop, in an open field, on the beach or fish from a small boat.
  - Avoid isolated sheds or other small structures in open areas.
  - Get away from open water.
  - Put down metal tools
  - Get away from tractors and other metal farm equipment.
  - Get away from motorcycles, scooters, golf carts and bicycles. Put down golf clubs.
  - Stay away from wire fences, clothes-lines, metal pipes, rails and other metallic paths which could carry lightning to you from some distance away.
  - In a forest, seek shelter in a low area under a thick growth of small trees. In open areas, go to a low place such as a ravine or valley. Be alert for flash flood.
  - If you are isolated in a level field or prairie and you feel your hair stand on end (which shows that lightning is about to strike), drop to your knees and bend forward putting your hands on your knees. Do not lie flat on the ground.

**For more information:**

Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publications. (Single copy requests only).

- Tornado Protection (TR-83B). Booklet about selecting and designing safe areas in buildings to resist high winds.

The following publications are available by writing the National Weather Service, 1325 East West Highway, Silver Spring, MD 20910, (301) 713-0090.

- Tornado Safety, NOAA PA 82001
- Thunderstorms and Lightning, NOAA PA 83001

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***Winter Storms and Extreme Cold***

From 1986 to 1990, about 428 people died due to excessive cold. Deaths from winter storms

are on the rise.

Snowfall may seem romantic but it can be dangerous. Heavy snowfall and extreme cold can immobilize an entire region. Even areas which normally experience mild winters can be hit with a major snow storm or extreme cold. The results can range from isolation due to power outages and blocked roads to the havoc of cars trying to maneuver on ice-covered highways. Whatever the case, winter storms usually involve human suffering. You should protect yourself and your family from the many hazards of winter weather--blizzards, heavy snow, freezing rain and sleet.

### **What to do before winter storm conditions**

1. Know the terms used to forecast winter weather conditions:
  - A winter weather advisory is issued when winter weather conditions, such as cold, ice and snow, are expected to hinder travel, cause significant inconveniences or create other types of hazardous conditions.
  - Freezing rain is forecast when expected rain is likely to freeze as soon as it strikes the ground, creating a coating of ice on roads and walkways.
  - Sleet is rain drops that freeze into ice pellets before reaching the ground. Sleet causes roads to freeze and become slippery.
  - A winter storm watch means that severe winter weather is possible.
  -

A winter storm warning means that heavy snow, sleet or freezing rain are expected.

- A blizzard warning means that heavy snow, winds and dangerously low temperatures are expected. A blizzard can cause severe weather conditions such as zero visibility and life threatening wind chill.
2. Be prepared:
    - Keep a battery-powered NOAA weather radio and a portable radio in working order; stock extra batteries.
    - Store food that can be prepared without an electric or gas stove.
    - Stock emergency water and cooking supplies.
    - Store rock salt to melt ice on walkways and kitty litter to temporarily generate traction.
    - Have flashlights, battery-powered lamps and extra batteries in case of a power outage. Candles and matches are a fire hazard.
  3. Be prepared for the possibility of isolation in your home.
    - Make sure you have sufficient heating fuel; regular fuel sources may be cut off.
    - Have available some kind of emergency heating equipment and fuel (a gas fireplace or a wood burning stove or fireplace) so you can keep at least one room of your house warm enough to be livable. If your furnace is controlled by a thermostat and your electricity is cut off by a storm you will need emergency heat.
    - Kerosene heaters are another option. However, check with your local fire

- department on the legality of using kerosene heaters in your community.
  - If you have a fireplace, store a good supply of dry, seasoned wood.
  - Keep fire extinguishers on hand, and make sure your family knows how to use them and knows fire prevention rules.
  - See the [Emergency Planning and Checklist](#) chapter for more information.
4. Winterize your home to extend the life of your fuel supply.
    - Insulate walls and attics.
    - Caulk and weather strip doors and windows.
    - Install storm windows or cover windows with plastic.

### **What to do during a winter storm**

1. Listen to the radio or television for updates on the weather condition. With early warning you may avoid being caught in a storm or be better prepared to cope with it.
2. Dress for the season:
  - Wear layers of thin clothing instead of single layers of thick clothing. You'll be warmer and as the temperature changes you can easily remove layers to remain comfortable.
  - Mittens are warmer than gloves.
  - Wear a hat; most body heat is lost through the top of the head.
  - Cover your mouth with scarves to protect lungs from directly inhaling the extremely cold air.
3. Overexertion can bring on a heart attack--a major cause of death during and after winter storms. If shovelling snow isn't critical, don't do it. If you must shovel snow, don't overexert yourself.
4. If you are isolated at home:
  - Conserve fuel by keeping your house cooler than usual and by temporarily "closing off" heat to some rooms.
  - When Kerosene heaters are used, maintain ventilation to avoid build-up of toxic fumes. Also, always refuel kerosene heaters outside and keep them at least 3 feet away from flammable objects.

### **Winter Driving Tips**

1. If you must travel, take public transportation whenever possible. If you must use a car, take winter driving seriously. Travel by daylight, and keep others informed of your schedule. Drive with extreme caution; never try to save time by driving fast or using back-road shortcuts.
2. Keep your car "winterized" with antifreeze. Carry a "winter car kit" that includes a windshield scraper, flashlight, tow chain or rope, shovel, tire chains, a blanket, a bag of sand or salt, a fluorescent distress flag and an emergency flare, in case you are trapped in a winter storm. Keep extra mittens, hats and outerwear in the car.
3. If a blizzard traps you in your car:
  - Pull off the highway; stay calm and remain in your vehicle where rescuers are most likely to find you.
  - Set your directional lights to "flashing" and hang a cloth or distress flag from

- the radio aerial or window.
- Do not set out on foot unless you can see a building close by where you know you can take shelter. Be careful: Distances are distorted by blowing snow. A building may seem close but too far to walk to in deep snow.
  - If you run the engine to keep warm, open a window slightly for ventilation. This will protect you from possible carbon monoxide poisoning. Periodically clear away snow from the exhaust pipe.
  - Exercise to maintain body heat but avoid overexertion. In extreme cold, use road maps, seat covers and floor mats for insulation. Huddle with passengers and use your coat as your blanket.
  - Never let everyone in the car sleep at one time. One person should look out for rescue crews.
  - Be careful not to use up battery power. Balance electrical energy needs--the use of lights, heat and radio--with supply.
  - At night, turn on the inside dome light, so work crews can spot you.
4. If you are trapped in a remote rural or wilderness area, spread a large cloth over the spot to attract attention of rescue personnel who may be surveying the area by air plane. Once the blizzard passes, you may need to leave the car and proceed on foot.

### **For more information**

Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publication. (Single copy requests only)

- Safety Tips for Winter Storms (L-96) Provides safety tips to protect potential victims of winter storms.
- The following publications are available by writing the National Weather Service, 1325 East West Highway, Silver Spring, MD 20910, (301) 713-0900.
- Are you Ready for a Winter Storm? NOAA PA 93003 (Spanish Version 91004)
- Winter Storms...The Deceptive Killers NOAA PA 91002

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## ***Earthquakes***

In 1988, 25,000 people died in a 6.9 magnitude earthquake in Armenia. In 1989, 63 people died in a 7.1 magnitude earth quake in the San Francisco Bay area.

An earthquake is a sudden shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, down telephone and power lines and result in fires, explosions and landslides. Earthquakes can also cause huge ocean waves, called tsunamis, which travel long distances over water until they crash into coastal areas.

Earthquake injuries are usually caused by building collapse or damage, flying glass from

broken windows, overturned furniture; and fires from broken chimneys ruptured gas and electrical lines. Injuries may also be caused by collapsing bridges and elevated roadways.

Scientists cannot precisely predict when earthquakes will occur. Populations in 41 states or territories are at moderate to high risk. Earthquakes occur most often in states west of the Rocky Mountains, but violent earthquakes have also occurred in the eastern U.S. All states are at some risk from this hazard.

### **Earthquake Preparedness Steps:**

1. Check for hazards that could make your house more dangerous during an earthquake:
  - Repair defective electrical wiring, leaky gas and inflexible utility connections, Bolt down water heaters and gas appliances.
  - Know where and how to shut off electricity, gas and water at main switches and valves. Check with your local utilities for instructions.
  - Place large or heavy objects on lower shelves. Securely fasten shelves to walls. Brace or anchor high or top-heavy objects.
  - Store bottled foods, glass, china and other breakables on low shelves or cabinets that can fasten shut.
  - Anchor overhead lighting fixtures solidly in place
  - Check and repair deep plaster cracks in ceilings and foundations. Get expert advice, especially if there are signs of structural defects.
  - Be sure the house is firmly anchored to its foundation.
2. Hold occasional earthquake drills so each member of your family knows what to do during an earthquake.
  - Locate safe spots in each room, under sturdy tables or desks or in strong, supported doorways. Reinforce this information by physically placing yourself and your family in these locations.
  - Identify danger zones in each room--near windows where glass can shatter or near book cases or other furniture that may fall over. During an earthquake, each family member should move away from these danger zones to the nearest safe spot.
3. Gather emergency supplies and prepare for evacuation if earth quake damage is severe. See [Emergency Planning and Checklist](#) chapters for help.
4. Develop a family plan for reuniting after an earthquake. Establish an out-of-state telephone contact and leave notes for other family members if you must relocate.
5. Review insurance to determine coverage for earthquake damage. Some damage may be covered even without specific earthquake insurance. Protect important home and business papers.

### **What to do during an earthquake**

1. Keep calm, and stay where you are. Most injuries during an earthquake occur when people decide to enter or exit buildings.
2. If you are indoors, take cover under a desk, table or bench, against an inside wall or



solid heavy framed doorway, and hold on. Stay away from glass, windows, outside doors or walls and anything that could fall and hurt you, such as lighting, furniture or fixtures.

3. If you are outdoors, stay there. Move away from buildings, street lights and utility wires.
4. If you are in a crowded public place, do not rush for a doorway --other people will have the same idea. Take cover, and move away from display shelves containing objects that may fall.
5. In a high-rise building, get under a desk, away from windows and outside walls. Stay in the building on the same floor. Do not be surprised if the electricity goes out if sprinkler systems or elevator or fire alarms go on--this often happens. Do not use elevators!
6. If you are in a moving vehicle, stop as quickly as safety permits, and stay in the vehicle. Avoid stopping near or under buildings, trees, overpasses or utility wires. Then proceed cautiously, watching for road and bridge damage.

### **What to do after an earthquake**

1. Be prepared for aftershocks, which occur from less than one minute after the initial shock to more than one year later. These secondary shock-waves are usually less violent than the main quake but can be strong enough to do additional damage to weakened structures.
2. Check for injuries. Do not attempt to move seriously injured persons unless they are in immediate danger of death or further injury. If you must move an unconscious person, first stabilize the neck and back, then call for help immediately.
  - If the victim is not breathing but has good pupil reflex, carefully position the victim for artificial respiration, clear the airway and commence mouth-to-mouth resuscitation.
  - Maintain body temperature with blankets. Be sure the victim does not become overheated.
  - Never try to feed liquids to an unconscious person.
3. Stay out of severely damaged buildings. Return to your home when authorities say it is safe to do so.
4. Use flashlights or battery powered lanterns. Do not use candles, matches or open flames indoors after earthquake because of possible gas leaks.
5. Wear sturdy shoes in areas covered with fallen debris and broken glass.
6. Clean up spilled medicines, bleaches, gasoline and other flammable liquids inside buildings. Evacuate the building if gasoline fumes are heavy and the building is not well ventilated.
7. Visually inspect utility lines, chimneys and appliances for damage.
  - If you smell gas, open windows and shut off the main gas valve. Leave the building immediately and report the leak to the gas company. Stay out of the building until no gas odor remains.
  - If you see electrical damage, switch off all electrical power at the main box.
  - If you can see that water pipes are damaged, shut off the water supply at the main valve.

- Do not switch on gas or electricity until the utility company has checked your home.
  - Do not flush toilets until you know that sewage lines are intact.
  - Check chimneys for cracks and damage. The initial check should be made from a distance. Approach chimneys with great caution. Have a professional inspect the chimney for internal damage before lighting a fire.
8. If water is cut off, use water from water heaters.
  9. Open doors cautiously. Beware of objects that may tumble off shelves.
  10. Use the phone only to report a life threatening emergency.
  11. Turn on your battery-operated radio (or plug in your radio or television if you still have electricity) to get the latest emergency information.
  12. Stay off the streets. If you must go out, travel with care. Watch for hazards created by the earthquake, such as fallen objects, downed electrical wires, weakened bridges, roads and sidewalks.
  13. Stay away from damaged areas, unless your assistance has been specifically requested by police, fire or relief organizations.
  14. If you live near coastal waters, be aware of possible tsunamis, also known as tidal waves. When local authorities issue a tsunami warning, assume that a series of dangerous waves are on the way. Stay away from the beach. See the [Tsunami](#) chapter for more information.

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## **Volcanoes**

Volcanoes are eruptions from the earth's interior which can cause violent explosions of gases and rock. Eruptions can cause lava flows, mudslides, avalanches, falling ash and floods. Active volcanoes in the U.S. are found mainly in Hawaii, Alaska and the Pacific Northwest.

Fresh volcanic ash, made of pulverized rock, can be harsh, acid, gritty, glassy and smelly. While not immediately dangerous to most adults, the combination of acidic gas and ash which may be present within miles of the eruption could cause lung damage to small infants, very old people or those suffering from severe respiratory illnesses.

Besides following basic emergency procedures, found in the [Evacuation](#) and [Shelter](#) chapters, keep these guidelines in mind:

1. Do not visit the volcano site; you could be killed by a sudden explosion. Public officials may designate safe viewing sites.
2. If ash is being expelled, avoid area downwind from the volcano. A building offers good shelter from volcanic ash but not from lava flows and rock debris.
3. Be aware of flying rocks and mudflows. The danger from a mudflow increases as you approach a stream channel and decreases as you move away from a stream channel toward higher ground. Mudflows can move faster than you can walk or run. Look upstream before crossing a bridge, and do not cross if the mudflow is

- approaching.
4. If ash is falling, stay indoors until the ash has settled unless there is danger of the roof collapsing.
  5. During an ashfall, close doors, windows and all ventilation in the house.
  6. Avoid driving in heavy dust unless absolutely required. If you do drive in dense dust, keep speed down to 35 mph or slower.
  7. Remove heavy ash from flat or low pitched roofs and rain gutters to prevent thick accumulation.

### **For more information:**

- Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publications. (Single copy requests only)
- Earthquake Safety Checklist (FEMA-46). This checklist provides safety tips to prepare for, respond to, and react in the immediate aftermath, of an earthquake
- Earthquake Safety Tips (L-111). Pamphlet providing safety tips for potential victims of earthquakes.
- Preparedness in High-Rise Buildings (FEMA-76). this publication provides safety tips and precautions for high-rise dwellers to take during and after an earthquake.
- Learning to Live in Earthquake Country --Preparedness in Apartments and Mobile Homes (L-143). Leaflet providing safety tips and information on how to best prepare for an earthquake.
- Family Earthquake Safety Home Hazard Hunt and Drill (FEMA-113). this booklet concentrates on identifying home hazards and practicing what to do if an earthquake occurs.
- Coping with Children's Reactions to Earthquakes and Other Disasters (FEMA- 48) Spanish Edition (FAMA-66). This pamphlet is designed to help parents deal with children's fears and anxiety following a disaster.
- For additional information contact the U.S. Geological Survey Earthquake Information Center Reston, VA 22092

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## ***Tsunamis***

Since 1945, more people have been killed as a result tsunamis than as a direct result of an earthquake's ground shaking.

A tsunami (pronounced soo-nam-ee), sometimes called a tital wave, is actually a series of enormous waves created by an underwater disturbance or earth quake. Tsunamis can move hundreds of miles per hour in an open ocean and smash into land with waves more than 100 feet high. In this century, more than 200 tsunamis have been recorded in the Pacific Ocean alone.

All tsunamis are potentially dangerous, even though they may not damage every coastline

they strike--some waves in the series are less hazardous than others. Tsunamis can strike anywhere along most of the U.S. coastline. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska and Hawaii.

### **How to prepare for a tsunami**

1. Heed tsunami warnings--they mean a tsunami exists. Listen to radio or television for information and follow instructions from your local authorities.
2. Advance warning of tsunamis sometimes comes in the form of a noticeable rise or fall in the normal depth of coastal water. This is nature's tsunami warning and should be heeded.
3. If you feel an earthquake in a Pacific coast area, turn on your battery powered radio to learn if there is a tsunami warning.
4. A small tsunami at one beach can be a giant wave a few miles away. Do not let the modest size of one wave allow you to forget how dangerous tsunamis are. The next wave may be bigger.
5. Prepare ahead for possible evacuation. See [Emergency Planning and Checklist](#) chapters for information.

### **What to do if a tsunami threatens your area**

1. If you are advised to evacuate do so immediately.
2. Stay away from the area until local authorities say it is safe. Do not be fooled into thinking that the danger is over when a single wave has come and gone--a tsunami is not a single wave but a series of waves.
3. Do not go to the shoreline to watch for tsunami. When you can see the wave, it is too late to escape it.

### **For more information:**

- Contact your local emergency management or civil defense office or the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024.
- Information can also be obtained from:
- Pacific Tsunami Warning Center, Ewa Beach, Hawaii (808) 689-8207
- Pacific Tsunami Warning Center, Palmer, Alaska, (907) 745-4212
- Operated by The National Weather Service of the National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce

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## **Fire**

Since 1900, more Americans have died in fires than have been killed in all of the wars during the same period. Residential fires are the leading cause of accidental death for children under the age of five.

Fire safety practices save lives. Every year 6,000 Americans die in fires, and more than 100,000 people are injured. Most fire deaths occur in the home, and many could have been prevented. As smoke detectors and other fire prevention steps have become more common in recent years, the deaths and injuries from fires have decreased significantly.

To understand the importance of fire prevention, be aware of the basic characteristics of fire. Fire spreads quickly, and you have no time to grab valuables or make a phone call. In two minutes a room can become life-threatening. In five minutes your house can be engulfed in flames. A fire's heat and smoke are more dangerous than the flames--inhaling the super-hot air can sear your lungs. Fire produces poisonous gases that make you disoriented and drowsy. Instead of being awakened by a fire, you may fall into a deeper sleep.

### **Fire safety and how to prevent fire**

1. Install smoke detectors in your house or apartment. Working smoke detectors double your chance of surviving a fire.
  - Place smoke detectors on every level of your house: outside bedrooms on the ceiling or high on the wall, at the top of open stairways or at the bottom of enclosed stairs and near (but not in) the kitchen.
  - Clean smoke detectors regularly and replace batteries once a year.
2. With your family, plan two escape routes from every room in the house.
  - Make sure windows are not nailed or painted shut. If you have security gratings on your windows, be sure they have a fire safety opening feature, so they can be easily opened from the inside.
  - Practice escaping from rooms with your eyes closed, since during a fire, the house will be filled with thick, black smoke.
  - Pick a place outside your home for the family to meet after escape.
3. Clean out storage areas. Don't let trash (such as old newspapers and magazines) accumulate.
4. Check electrical wiring:
  - Inspect extension cords for frayed or exposed wires or loose plugs.
  - Do not overload extension cords or outlets; if you need to plug in two or three appliances, get a UL-approved unit with built-in circuit breakers to prevent sparks and short circuits.
5. Never use gasoline, benzine, naphtha or similar liquids indoors.
  - Store them in approved containers and well-ventilated storage areas.
  - Never smoke near these flammable liquids.
  - After use, safely discard all rags or materials soaked in flammable material.
6. Check heating sources. Many home fires are started by faulty furnaces or stoves, cracked or rusted furnace parts and chimneys with creosote build-up. Make sure your home heating source is clean and in working order. Call professionals for help.
7. Alternative heating sources, such as wood, coal and kerosene heaters, should be used carefully. Make sure that:
  - You check with your local fire department on the legality of using kerosene heaters in your community.

- There is proper ventilation to the outside.
  - Adequate space is left around heater.
  - The floor and nearby walls are properly insulated.
  - You use only the type of fuel designated for your unit and follow manufacturers instructions.
  - You store ashes in a metal container outside and away from any buildings.
  - You keep walls, furniture, drapery and any flammable items away from open flame. Always keep a screen in front of the fire place.
8. Make sure that home insulation is not in contact with electrical wiring.
  9. Know where your gas meter and central electrical panels are so you can shut them off in an emergency. If you shut off your gas line, allow only a gas company representative to turn it on again to make sure it is done properly.
  10. Ask your local fire department if they will inspect your house for fire safety and prevention.

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### ***Wildland fires***

If you live in wildland areas--on remote hillsides, in valleys, prairies or forests where flammable vegetation is abundant--your house could be a target for wildland fire. Be prepared for these intense fires, triggered by lightning or accidents, that sweep through wildland areas:

1. Call local fire authorities and get information about wildland fires in your area. find out whether they can inspect your house and property for potential hazards.
2. Be aware of wildland fire safety considerations.
  - Use fire-resistant materials building or retrofitting structures.
  - Create a safety zone which separates your home from combustible plants and vegetation.
  - Keep branches around your home free of dead or dying wood and moss.
  - Combustible or flammable materials should be kept a safe distance from your home.
3. Be prepared to evacuate. See [Evacuation](#) chapter for detailed information about evacuation preparedness.

### **What to do in case of fire**

1. To put out a small fire, cut off its air or fuel supply, or use water or a fire extinguisher, but do not try to put out a fire which is getting out of control. Get everyone out of the house and call the fire department immediately.
2. Never use water on an electrical fire. Use only a fire extinguisher.
3. Oil and grease fires occur primarily in the kitchen. Smother the flames with baking soda or salt or put a lid over the flame, if it is burning in a pan.
4. If your clothes catch on fire, stop, drop and roll until the fire is extinguished. Running only makes the fire burn faster.

5. Sleep with your door closed. If you wake up to the sound of a smoke detector, feel the bottom of the door with the palm of your hand before you open it.
  - If the door is cool, leave immediately. Be prepared to bend low or crawl; smoke and heat rise, and the air is cleaner and cooler near the floor.
  - If the door is hot, escape through a window. If you cannot escape, hang a white or light-colored sheet outside the window, alerting fire fighters to your presence.

### **What to do after a fire**

1. If you are the homeowner, see that holes in the house are covered against rain and that entry to your home can be secured. The fire department can assist you.
2. If you are a tenant, contact the landlord. It is the property owner's responsibility to prevent further loss or damage to the site. Secure your personal belongings either within the building or by moving them to another location.
3. Contact your insurance agent about estimates and loss coverage.
4. Contact your local disaster relief service, such as the American Red Cross or Salvation Army, if you need temporary housing, food, eyeglasses or medicines which were destroyed in the fire.
5. Do not enter a fire-damaged building unless authorities have given you permission.
6. When entering a building, be watchful for signs of heat or smoke--they may signify smoldering remains of a fire.
7. Have an electrician check your household wiring before the current is turned back on. Do not attempt to reconnect any utilities yourself. Leave this to the fire department and other authorities.
8. Beware of structural damage. Roofs and floors may be weakened and need repair.
9. Discard food, beverages and medicines that have been exposed to heat, smoke or soot.
10. Refrigerators or freezers left closed will hold their temperature for a short time. However, do not attempt to refreeze food that has thawed.
11. Beginning immediately after the fire, collect receipts for any money you spend. These receipts are important for both insurance and income tax claims.
12. If you have a safe or strong box, do not try to open it. A safe or fire proof box can hold intense heat for several hours. If the door is opened before the box has cooled, the entering air combined with the high internal temperature may cause the contents to burst into flames.
13. Do not throw away any damaged goods until an official inventory has been taken. All damages are taken into consideration when developing your insurance claims.
14. If a building inspector says the residence is unsafe and you must leave your home:
  - Contact local police, who will watch the property during your absence.
  - Take with you identification; medicines, glasses or hearing aids; and valuables, such as credit cards, checkbooks, insurance policies, bank papers, jewelry and the like.
  - Notify friends, relatives, police and fire departments, your insurance agent, the mortgage company, utility companies, delivery services, employers,

schools and the post office of your whereabouts.

**For more information:**

- Contact your local fire department or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C, 20024, ATTN: Publications, for the following publications. (Single copy requests only).
- An Ounce of Prevention (FA-76). This booklet demonstrates how smoke detectors and automatic sprinklers protect lives at minimum expense.
- Winter-Fire Safety Tips for the Home (L-97). Describes safety tips for the home on room heating, fireplaces, furnace-heating, kitchen stoves, and other places where winter fire could occur.

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### *Hazardous Materials Incidents*

The Chemical Manufacturers Association estimates that in an average year, one out of every three trains and one out of every 10 trucks is carrying hazardous materials.

From industrial chemicals and toxic waste to household detergents and air fresheners, hazardous materials are part of our everyday lives. Affecting urban, suburban and rural areas, hazardous materials incidents can range from a chemical spill on a highway to groundwater contamination by naturally occurring methane gas.

Hazardous materials are substances or materials which, because of their chemical, physical or biological nature, pose a potential risk to life, health or property if they are released. Potential hazards can occur during any stage of hazardous materials use: production, storage, transportation, use and disposal.

Production and storage does not occur only in chemical plants; Your local service station's supply of gasoline or diesel fuel can be hazardous, and hospitals regularly store radioactive and flammable materials as well as other hazardous substances used in medical treatments.

Hazardous materials are transported daily in this country by air, water, road, rail and pipeline. Of the 1.5 billion tons of hazardous materials transported each year, more than half moves by trucks along the nation's highways. The U.S. Environmental Protection Agency reports that as of July 1990, hazardous waste is disposed at 30,000 hazardous materials waste sites in the country. More than 1,000 of these sites are on a national priority list for cleanup. Fortunately, federal legislation enables communities to become aware of possible hazardous material incidents and prepare for them. Legislative provisions enable local level planners to work with industry to identify and reduce risks from toxic chemicals and, if necessary, seek corrective action. Individuals also have the opportunity to identify and alter potentially hazardous conditions in their communities. For more information about household hazardous materials, see the information box at the end of this chapter. Preparing



for a hazardous materials incident

1. Know local warning and notification methods used in the event of a hazardous materials incident. These could include:
  - Warning sirens or horns. These outdoor warning systems may not be heard if you are indoors or inside vehicles.
  - Emergency Broadcast System (EBS). The radio and television EBS disseminates community emergency information.
  - "All-Call" telephoning. This method uses an automated system to ring up area telephones and provide a recorded emergency message when telephones are answered.
  - Announcements over cable television. In some communities, cable systems are equipped to allow emergency response forces to relay announcements over cable television stations.
  - Residential route alert. Motor vehicles equipped with public address systems travel predesignated routes to notify people of an emergency situation.
2. Contact your Local Emergency Planning Committee (LEPC) to find out precise information about where reportable quantities of extremely hazardous substances are stored and where they are used.
  - Ask your local LEPC or emergency management office about community plans for responding to a hazardous materials accident at a plant or other facility, or a transportation accident involving hazardous materials.
  - Contact your police and fire departments about emergency procedures.
3. Use this information to evaluate the risk to your family; determine how close you are to freeways, railroads or factories which may carry, generate or dump toxic waste.
4. Coordinate a neighborhood tour of any local industry's manufacture and storage of hazardous materials. Include interested neighbors, local officials and the media.
5. Talk to local officials to find out how regulations are enforced.
6. An accident may force you and your family to evacuate immediately for a few hours or several days. Be prepared for this possibility--see the [Emergency Planning and Checklist](#) chapters for important information.

### **What to do in case of a hazardous materials incident**

1. If you witness a hazardous materials accident, spill or leak, call 911, your local emergency notification number or the fire department.
2. If you hear a warning signal, turn on your radio or television for further information from emergency response personnel. Follow all instructions carefully.
3. Stay away from the incident site in order to minimize your chances of contamination.
4. If you are caught outside during an incident, try to stay upstream, uphill and upwind--hazardous materials can quickly be transported by water and wind. In general, try to go at least one-half mile (10 city blocks) from the danger area; for many incidents you will need to go much further.
5. If you are in a motor vehicle, close off ventilation and shut your windows. this will

- reduce the possibility for contamination or inhaling the hazardous material.
6. If you are asked to evacuate, do so immediately.
    - Before leaving your home or office, close all windows, shut vents and turn off attic fans to minimize contamination.
    - See [Evacuation](#) chapter for more important information.
  7. In certain circumstances, you will be requested to stay indoors, rather than evacuate.
    - Strictly follow all instructions given by emergency authorities.
    - To reduce the possibility of toxic vapors entering your home, seal all entry routes as efficiently as possible. Close and lock the windows and doors. Seal gaps under doorways and windows with wet towels and windows with wet towels and duct tape or similar thick tape.
    - Seal any gaps around window air conditioning units, bathroom and kitchen exhaust fan grilles and stove and dryer vents with tape and plastic sheeting, wax paper or aluminum wrap.
    - Close all fireplace dampers.
    - Close as many internal doors as possible.
    - If local authorities warn of an outdoor explosion, close all drapes, curtains and shades. Stay away from windows to prevent injury from breaking glass.
    - Turn off all ventilation systems, including furnaces, air conditioners, vents and fans.
    - Building superintendents should set all ventilation systems to 100 percent recirculation so that no outside air is drawn into the structure. Where this is not possible, ventilation systems should be turned off.
    - If you suspect that gas or vapors have entered the building, take shallow breaths through a cloth or towel.
    - Remain in protected, interior areas of the building where toxic vapors are reduced, and keep your radio with you.
  8. Avoid contact with any spilled liquid materials, airborne mist or condensed solid chemical deposit. Keep your body fully covered and wear gloves, socks and shoes--although these measures may offer minimal protection.
  9. Avoid eating or drinking any food or water which may be contaminated.
  10. If you learn that you will be sheltered indoors, fill the bathtub and large containers with water. Be prepared to turn off the intake valve in case authorities advise you to do so.

### **What to do after an incident**

1. Do not return home until local authorities say it is safe.
2. Upon returning to your home, open windows, vents and turn on fans to provide ventilation.
3. A person or item that has been exposed to a hazardous chemical may be contaminated and could contaminate other people or items. If you have come in contact with or have been exposed to hazardous chemicals, you should:
  - Follow decontamination instructions from your local authorities. (Depending on the chemical, you may be advised to take a thorough shower. Or, you may be advised to stay away from water and follow another procedure.)

- Seek medical treatment for unusual symptoms that may be related to the hazardous material release.
  - If medical help is not immediately available and you believe you may be contaminated, remove all of your clothing and shower thoroughly (unless local authorities say the chemical is water reactive and advise you to do otherwise). Change into fresh, loose, warm clothing and seek medical help as soon as possible.
  - Place exposed clothing and shoes in tightly sealed containers without allowing them to contact other materials, and call local authorities to find out about proper disposal.
  - Advise everyone who comes in contact with you that you may have been exposed to a toxic substance.
4. Find out from local authorities how to clean up your land and property.
  5. Report any lingering vapors or other hazards to your local emergency services office.

**For more information:**

- Contact your local fire department, Local Emergency Planning Committee (LEPC), state emergency response commissioner, state emergency management agency or the Federal Emergency Management Agency, Technological Hazards Division, Federal Center Plaza, 500 C. Street, SW, Washington, D.C. 20472, (202) 646-2861
- To obtain the following Home Study Course write to:
- Home Study Program Administrative Office Emergency Management Institute 16825 South Seton Avenue Emmitsburg, MD 21727
- Hazardous Materials: A Citizen's Orientation Home Study Course (L-167). This pamphlet is used to enroll in a home study course that covers the sources and potential hazards associated with hazardous materials.
- Other publications are available from the following sources:
- Hazardous Waste From Homes. An introduction to the household hazardous waste problem with advice on disposal of common type of products. Available from Enterprise for Education, 1320A Santa Monica Mall, Santa Monica, CA 90401. Cost: \$2.75 plus \$1.50 postage and handling.
- ***Household Hazardous Waste Wheel***. Shows chemical ingredients, alternatives, hazardous properties, and disposal options for common household products in handy format. Available from Environmental Hazards management Institute (EMHI), P.O. Box 932, 10 Newmarket Road, Durham, NH 03824. (603) 868-1496. Cost: \$275. for 1-9; discount in quantity.
- ***Water Sense Wheel***. Reviews sensory clues of the presence of contaminants in drinking water, Federal standards, health effects, and chemical-specific water treatment options. Available from Environmental Hazards Management Institute (EHMI), P.O. Box 932, 10 Newmarket Road, Durham, NH 03824. (603) 868-1496. Cost: \$2.75 for 1-9; discount in quantity.
- Additional Information may be available by contacting:
- U.S. Environmental Protection Agency Superfund Response/NRT 401 M Street, SW Washington, D.C. 20460 (202) 475-8600 or (202) 479-2449 in the Washington, D.C.

- area
- Chemical Manufacturers Association 2501 M Street, N.W. Washington, D.C., 20037  
(202) 887-1100

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## ***Nuclear Safety***

No one has ever been killed or injured by a radiation accident at a commercial nuclear power plant in the U.S., even though these plants have been generating commercial power for over 30 years.

Nuclear power plants operate in most states in the country and in 1991, provided 20 percent of the nation's power. Nearly three million Americans live within 10 miles of an operating nuclear power plant. Though the construction and operation of these facilities are closely monitored and regulated by the Nuclear Regulatory Commission, accidents at these plants are possible. An accident could result in dangerous levels of radiation that could affect the health and safety of the public living near the nuclear power plant.

Local and state governments, Federal agencies and the electric utilities have developed emergency response plans for use in the event of a nuclear power plant accident. These plans define two "emergency planning zones". One covers an area within a ten-mile radius of the plant where it is possible that people could be harmed by direct radiation exposure. The second zone covers a broader area, usually up to a 50-mile radius from the plant, where accidentally released radioactive materials could contaminate water supplies, food crops and livestock.

### **Understanding radiation**

Atoms are the building blocks of all material. If an atom is unstable--meaning it contains excess energy--it emits radiation.

Each of us is exposed to radiation from radioactive materials that exist in nature, including the sun and earth. Small traces of radiation are even present in food and water. Radiation is also released from man-made sources such as x-ray machines, television sets and microwave ovens. Nuclear power plants use the heat generated from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity.

In general, radiation has a cumulative effect. The longer a person is exposed to radiation, the greater the risk. A high exposure to radiation can cause serious illness or death. Studies show that any negative health effects that might be caused by low-level exposure to radiation cannot be distinguished from those caused by other environmental hazards.

If an accident at a nuclear power plant were to release radiation in your area, local authorities would activate warning sirens. They would also instruct you how to protect

yourself through the Emergency Broadcast System (EBS) on local television and radio stations.

In general, there are three ways to minimize radiation exposure to your body: distance, shielding and time.

- *Distance.* The more distance between you and the source of the radiation, the better. In a serious nuclear power plant accident, local authorities will call for an evacuation--to increase the distance between you and the radiation.
- *Shielding.* Like distance, the more heavy, dense material between you and the source of the radiation, the better. This is why local authorities could advise you to remain indoors if an accident occurs at a nearby nuclear power plant. In some cases, the walls in your home would be sufficient shielding to protect you.
- *Time.* Most radioactivity loses its strength fairly quickly. In a nuclear power plant accident, local authorities will monitor any release of radiation and determine when the threat has passed.

### **How to prepare for an emergency**

1. Know the terms used to describe a nuclear emergency:
  - Notification of unusual event means a small problem has occurred at the plant. No radiation leak is expected. Federal, state and county officials will be told right away. No action on your part will be necessary.
  - Alert means a small problem has occurred, and small amounts of radiation could leak inside the plant. This will not affect you. Federal, state and county officials will stand by. You should not have to do anything.
  - A site area emergency is a more serious problem. Small amounts of radiation could leak from the plant. If necessary, state and county officials will act to assure public safety. Area sirens may be sounded. Listen to your radio or television for safety information.
  - A General emergency is the most serious problem. Radiation could leak outside the plant and off the plant site. The sirens will sound. Tune to your local radio or television station for reports. State and county officials will act to assure public safety. Be prepared to follow their instructions promptly.
2. Learn your community's warning system. Nuclear power plants are required to install sirens and other warning systems to cover a ten-mile area around the plant.
  - Find out when the sirens will be tested next and what they sound like.
  - The next time a test is conducted in your area, determine whether you can hear them from your home.
3. Obtain public emergency information materials from the power company that operates your local nuclear power plant or from your local emergency services office. If you live within 10 miles of the power plant, you should receive these materials every year from the power company or your state or local government.
4. Learn the emergency plans for schools, day care centers, nursing homes and other places where members of your family might be. Learn where people would go in case of evacuation. Stay tuned to your EBS stations for further updates.

5. Be prepared to evacuate:
  - Gather in advance clothing, a battery-powered radio and personal items to take with you.
  - Consider your transportation options. If you do not own or drive a car, call your local emergency management office and ask for more information.
  - See the [Emergency Planning and Checklist](#) chapters for important details.

### **What to do in a nuclear power plant emergency**

1. Keep calm. Not all incidents result in the release of radiation. The incident could be contained inside the plant and pose no danger to the public.
2. Stay tuned to local radio or television stations. Local authorities will provide specific information and instructions.
  - The advice given will depend on the nature of the emergency, how quickly it is evolving and how much radiation, if any, is likely to be released.
  - Local instructions should take precedence over any advice given in this handbook.
  - Review the public information materials you received from the power company or government officials.
3. Evacuate if you are advised to do so.
  - Close and lock home doors and windows.
  - Keep car windows and vents closed; use recirculating air.
  - Listen to radio broadcasts for evacuation routes and other instructions.
  - See the [Evacuation](#) chapter for important details.
4. If you are not advised to evacuate, remain indoors.
  - Close doors and windows.
  - Turn off the air conditioner, ventilation fans, furnace and other air intakes.
  - Go to a basement or other underground area if possible.
  - Keep a battery-powered radio with you at all times.
  - If you must go outdoors, cover your nose and mouth with a handkerchief.
5. Shelter livestock and give them stored feed, if you are advised to do so by local authorities.
6. Do not use the telephones unless absolutely necessary. All lines will be needed for emergency calls.
7. If you have just been outdoors, take a thorough shower.
  - Change your clothes and shoes.
  - Put the items you were wearing in a plastic bag.
  - Seal the bag and store it out of the way.
8. Put food in covered containers or in the refrigerator. Food not previously in covered containers should be washed first.

### **For more information:**

- Contact your local emergency management or civil defense office or the Field Operations Branch, Technological Hazards Division, Federal Emergency

## ***National Emergencies***

Americans recognize that having information about what to do in a national emergency contributes to survival according to national public opinion surveys.

In addition to the natural and technological hazards described in this publication, Americans face other dangers which could have far greater consequences. These are threats to the country's national security--such as a nuclear or conventional weapons attack--posed by other governments or extremist groups.

Is the United States at risk? Unfortunately, the answer is yes. No one can predict the future or control how other countries or leaders might use their weapons. As long as nuclear, chemical and biological weapons exist, there is a chance, however unlikely, that they will be used some day. There is no need for undue alarm. But there is a need for awareness and an understanding of security threats.

### **Nuclear weapons**

The number of countries with nuclear weapons capabilities is growing. The danger of a strategic attack on the United States has diminished. However, a nuclear war between two other countries, an accidental launching of a nuclear warhead for a major accident at a nuclear weapons storage facility are all possibilities even if unlikely.

Understanding the effects of nuclear weapons--knowing what could happen and how to respond --is critical to survival. Many people who would otherwise die or be seriously injured in an attack could save themselves if they took steps to prepare and learn what to do if a nuclear weapon is ever detonated.

Nuclear weapons produce deadly direct effects--blinding light, intense heat and thermal radiation that causes fires, nuclear radiation and a blast wave similar to a tidal wave of air. The level of devastation depends on the size and type of weapon, the weather, terrain and height of explosion. These direct effects can extend miles from the point of impact, known as "ground zero".

There is no way of knowing how much warning time there would be before an attack. A surprise attack on the U.S., though very unlikely remains possible.

If there were a threat of a nuclear attack, people living near potential targets could be advised to evacuate or they could decide on their own to evacuate to areas not considered likely targets. The federal government works with states and communities to develop evacuation plans.

Although blast shelters can protect people from the direct effects of a nuclear detonation, there are virtually none in the U.S.

## **Radioactive fallout**

A nuclear detonation near or on the ground sucks up large quantities of earth and other debris which form what is known as a "mushroom cloud". These particles become radioactive and fall back to earth as radioactive fallout.

The amount and distribution of radioactive fallout would depend on the size and type of weapon and the weather, especially the wind. Large, heavy particles can fall back to earth within a few minutes or hours. Smaller particles can be carried by winds for hundreds of miles and remain in the air for weeks, or even months before falling back to earth.

In general, fallout radiation has a cumulative effect. The longer a person is exposed to radiation, the greater the risk. The effects of radiation are usually more severe on the very young, the elderly and people not in good health. Healthy people can be exposed to a small daily dose of radiation over extended periods of time without incurring serious illness, although there may be delayed consequences.

Early symptoms of radiation sickness include: lack of appetite, nausea, vomiting, fatigue, weakness and headache. Later, the person may have a sore mouth, loss of hair, bleeding gums, internal bleeding and diarrhea. Not everyone who gets radiation sickness experiences all these symptoms, and some people exposed to radiation may not experience any symptoms for several days, months or years.

A person cannot "catch" radiation sickness from someone else. Like injury from poison or a burn, radiation sickness is not contagious. Someone with radiation sickness is not "radioactive" and cannot make someone else radioactive.

## **Protection from radioactive fallout**

Following a nuclear attack or a single nuclear blast, many areas of the country could escape fallout altogether or experience non-life-threatening levels of radiation. However, there is no way of predicting what areas of the country would be threatened by fallout or to what degree. No locality in the U.S. can be considered free from at least the risk of receiving deadly levels of radiation from drifting fallout in the event of a nuclear detonation.

Though people can see fallout-it looks like sand or a fine dust-- they cannot see the radiation given off by fallout particles. Radiation detection instruments are needed to determine the level of radiation and the degree of threat it poses. State and local governments are responsible for maintaining a supply of radiation detection equipment. These instruments are also available through private companies.

Protection from radioactive fallout requires taking shelter. There are three factors to consider. The first factor is shielding. The more heavy, dense materials--such as thick walls,



concrete bricks, books and earth--between you and the fallout particles, the better.

The second factor is distance. The more distance between you and the fallout, the better. For example, the center of a building would offer more protection than near an outside wall, because there would be more distance between you and the radioactive fallout. For the same reason, the middle floor of a high-rise building would offer more protection than the first floor or a top floor near the roof, where fallout particles could collect. As shown in the illustration, considering both shielding and distance factors, the best places for protection would be: a below-ground corner of a home basement, or in the center of a basement of a tall building, or in the center of a middle floor of a tall building.

The third factor is time. Fallout radiation loses its intensity fairly rapidly. In time, people would be able to leave fallout shelters. Generally, radioactive fallout would pose the greatest threat to people during the first two weeks after a nuclear detonation.

A fallout shelter does not need to be a special type of building. It can be any space in a house or public building with walls and roof that are thick and dense enough to absorb the radiation given off by the fallout particles from outside. A fallout shelter is not the same as a blast shelter. Both types of shelters provide protection from radiation, but a blast shelter can also resist the blast effects of a nearby nuclear explosion.

In nearly every community, government authorities have identified places that could provide fallout protections. Designated public fallout shelters include buildings, churches, subways, tunnels, mines and caves. Some shelters are marked with a yellow and black fallout shelter sign, others are not. These shelters are not stocked with food, water or other emergency supplies--you would likely need to provide your own.

### **Electromagnetic pulse**

In addition to other effects, a nuclear weapon detonated in or above the earth's atmosphere can create an electromagnetic pulse (EMP)--a high density electrical field. EMP acts like a stroke of lightning but is stronger, faster and briefer.

Although EMP cannot harm people, it can damage many electronic devices connected to power sources or antennas. EMP can damage communications systems, computers, electrical appliances and automobile or aircraft ignition systems. The damage could range from a minor interruption to actual burnout of components. Electronic equipment within 1,000 miles of a high-altitude nuclear detonation could be affected. Battery-powered radios with short antennas generally would not be affected.

### **How to prepare for an attack**

1. Learn the warning signals used in your community. Make sure you know what the signals are, what they mean, how they will be used, and what you should do when you hear them.
2. Check with your local emergency services office to learn whether you live or work

- near a potential target.
3. Learn where public fallout shelters are located. Ask local authorities about plans to shelter citizens and whether any provisions have been made for food, water and other emergency needs.
  4. Learn how to build a temporary fallout shelter. Even if you do not live near a potential nuclear target, you could be threatened by radioactive fallout.
  5. Learn about your community's evacuation plans. Such plans include routes, relocation sites and transportation options for people who do not own cars or have special needs. See [Evacuation](#) chapter for more information.
  6. Gather food, water and emergency supplies to prepare for evacuation or a shelter stay. The more the better.
    - o Foods should be nonperishable goods such as canned items that do not require refrigeration or preparation.
    - o Store water in sealed, unbreakable containers. You would need at least one gallon of water a day, per person.
    - o See the [Emergency Planning and Checklist](#) chapter for a list of supplies.
  7. Write for other emergency preparedness booklets that you may need, such as shelter designs and first aid manuals. Publications are listed at the end of this chapter.

### **Improvising fallout shelters**

1. If an attack is imminent and you have no immediate access to a permanent shelter, improvise a shelter. The best place is the corner of a basement that is deepest below ground level.
2. The more shielding materials used, the more protection there is against fallout radiation. The following shielding materials can be used:
  - o Concrete bricks, earth and sand are some of the materials that are dense or heavy enough to provide fallout protection.
  - o House doors, especially heavy outside doors. If you use paneled or hollow core doors, stack them in double layers.
  - o Dressers, chests, bookcases, trunks, boxes or cartons. Fill them with sand or earth after they are in position, so they are not too heavy or will not collapse while being carried.
  - o Piles of books and magazines or stacks of firewood or lumber.
  - o Flagstone from outside walks and patios.
3. If you build a shelter in your basement, start by setting up a large sturdy table or workbench in the corner that is deepest below ground level.
  - o Place on the table as much shielding material as it will hold without collapsing.
  - o Then place as much shielding material around the table as you can; then stack up the material as high as the table top.
  - o Finally, once everyone is inside the shelter, block the opening with additional shielding materials.
4. If you do not have a large table or workbench, or if you need more shelter space, use furniture--such as earth-filled dressers or chests to form the walls of your shelter as large as you require.

- For the shelter "ceiling" use heavy outside doors or reinforced hollow core doors.
  - Pile as much shielding material on top of the doors as they will hold; use reinforcing supports in the middle of the ceiling if you need to prevent sagging and collapse.
  - Stack shielding material outside shelter "walls".
  - Once everyone is inside the shelter, close off the opening with additional shielding material, while allowing for ventilation.
5. You can also use a below-ground storm cellar as a fallout shelter. Additional shielding may be required for adequate protection.
- If the roof of the storm cellar is made of wood or other light material, reinforce it with additional shielding for overhead protection.
  - It may be necessary to shore up the roof with lumber or timbers to support the added shielding weight.
  - Improve protection by blocking the entrance from the inside with eight-inch concrete blocks or an equivalent thickness of earth, sandbags or bricks after everyone is inside the shelter.
  - Raise the outside to knock off any fallout particles that may have collected on it. Keep particles from entering the cellar.
6. If your home has a crawl space between the first floor and ground underneath and is set on foundation walls (not on pillars), you may be able to improve shelter protection for your family.
- Gain access to the crawl space through the floor or an outside foundation wall.
  - Select the portion of the crawl space area that is under the center of the house, as far away as possible from any outside foundation wall.
  - Put shielding material-- preferably bricks, blocks or containers filled with sand or earth around the area, from the ground level up to the first floor, to form the "walls" of the shelter.
  - On the floor above (inside the building), place additional shielding materials to form the "roof" of your shelter.
  - Use supports to shore up the "roof", if necessary.
  - You may want to dig out your shelter area to make it deeper, so you can stand erect or at least sit up in it.
7. If you do not have a basement, crawl space or access to some other underground area, you can improvise a shelter in an interior area of a first floor of a single family home, or in an interior area of a middle floor of a highrise building.
8. If no better fallout protection is available, a boat with an enclosed cabin can be used. You will need a broom, bucket or pump-and-hose to wash or sweep off fallout particles that fall on the boat.
- The boat should be anchored or cruised slowly at least 200 feet offshore, in water at least five feet deep. This distance from the shore protects you from radiation released by fallout particles on nearby land. A five-foot water depth allows for sufficient absorption of radiation from particles falling into the water and settling on the bottom.
  - Stay inside the boat as much as possible, going outside only to sweep or

- flush off any particles which have landed on the boat.
9. Make sure all improvised shelters offer enough ventilation, a must for removing carbon dioxide and keeping the inside air from getting too hot. Too much carbon dioxide causes dizziness, shortness of breath and nausea. High heat and humidity can cause collapse and even death.
    - Air can go around corners, but dangerous radiation cannot easily do so. Make all air openings indirect to shield out the radiation given off by fallout particles.
    - In very hot weather, you will need two ventilation openings: one to bring in fresh air and one at the opposite side to let out the stale air.
    - Continuously ventilate the shelter with hand-held fans to reduce heat.
  10. Listen for news reports to find out when it is recommended to relocate to a more permanent and protective shelter. Follow all instructions.

## **Terrorism**

Extremists sometimes use terrorism to effect change. Acts of terrorism range from assassinations, kidnappings and bomb scares to the threat of biological and chemical weapons.

In the immediate area of a terrorist act, you would need to rely on local police, fire and other officials for guidance on how to respond. However, you can prepare in much the same way you would prepare for other crisis events.

- Be alert and aware of the surrounding area. The very nature of terrorism suggests that there may be little or no warning.
- Take precautions when traveling. Be aware of conspicuous or unusual behavior. Do not accept packages from strangers. Do not leave luggage unattended.
- Learn where emergency exits are located. Think ahead about how to evacuate a building, subway or congested public area in a hurry. Note where staircases are located.
- Notice surroundings. Be aware of heavy or breakable objects that could move, fall or break in an explosion.

Were you to be in the immediate area of an act of terrorism, remember what you have learned about responding to other emergencies. Specific chapters to consult are:

- The Earthquakes and Fire chapter for information pertinent to explosions and fires in buildings.
- The Hazardous Materials chapter for information on sealing a home.
- The [Emergency Planning and Checklist](#) chapter for information about preparing an essential supplies kit prior to an emergency.
- The [Shelter](#) chapter for measures regarding water purification.
- The [Evacuation](#) chapter for information on evacuation procedures.

## **Biological and Chemical Weapons**

More countries today have access to biological and chemical weapons. Biological weapons are organisms or toxins that can kill or incapacitate people, livestock and crops. They can be dispersed by aerosols, animal carriers and through food and water contamination. Chemical weapons are poisonous gases, liquids or solids that have toxic effects on people, animals or plants. they can be released by bombs, sprayed from aircraft and boats and used to contaminate the air and food and water supplies.

In the unlikely event of a biological or chemical weapon attack, you would be instructed to either take immediate shelter where you were and seal the premises or evacuate the area immediately. In a shelter situation, you would need to take immediate actions to prevent a biological or chemical agent from entering the shelter. This could be done by turning off the ventilation system and sealing all windows, doors, chimneys, vents and other openings with plastic film and duct tape.

### **For more information**

- Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publication. (Single copy requests only)
- Planning for Survival (H-20). This hand book provides information about the effects of nuclear detonation and protective actions that can be taken by the public.
- To obtain the following Home Study Course write to: FEMA Home Study Program, Administrative Office, Emergency Management Institute, 16825 South Seton Avenue, Emmitsburg, MD 21727.
- Preparedness Planning for a Nuclear Crisis: A Citizen's Guide to Civil Defense and Self-Protection--Home Study Course (HS-4). This pamphlet is used to enroll in a home study course that covers the effects of nuclear weapons, evacuation and sheltering, preparing and stocking a fallout shelter, and how to develop emergency plans to improve the chances of surviving a nuclear attack.

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## ***Evacuation***

The largest peacetime evacuation occurred during Hurricane Elena in 1985 when 1.5 million people evacuated coastline areas in the Gulf states.

People are forced to evacuate more often than you may realize. Hundreds of times each year, transportation or industrial accidents release harmful substances, forcing thousands of people to leave their homes and go to a safer area. Fires and floods cause evacuation even more frequently. And almost every year people along the Gulf and Atlantic coasts need to evacuate in the face of approaching hurricanes.

As a result, evacuation planning has been in progress for many years. Specific evacuation plans vary by area and by disaster, so contact your local emergency management or civil defense office for your community's plan.

If an evacuation is called for in your community, local officials will provide information via television and radio broadcasts. Government agencies, the American Red Cross and other disaster relief organizations will provide emergency shelter and supplies. But just in case, you should plan to have enough water, food, clothing and emergency supplies to last at least three days. In the event of a catastrophic national emergency, you could need to be self-sufficient for at least two weeks.

The amount of time you have to evacuate your home or community will depend on the disaster. If the disaster is a hurricane or other severe storm that can be monitored, you could have a day or two to get ready. But many disasters offer no time at all for people to gather even the most basic necessities. This is why you should prepare now.

### **Planning for evacuation**

1. Use the [Emergency Planning and Checklist](#) chapter to gather emergency supplies for you and your family in case of evacuation. Collect these crucial materials, especially food and water, well in advance of a disaster, once you are told to evacuate, you may have only minutes to leave.
2. Review possible evacuation procedures with your family so that everyone understands what to do and where to meet if you are separated.
  - Ask a friend or relative outside your area to be the "checkpoint" so that everyone in the family can call that person to say they are safe.
  - Find out where children will be sent if they are in school when an evacuation is announced.
3. Plan now where you would go if you had to evacuate.
  - Consider the homes of relatives or friends.
  - Contact the local emergency management or civil defense office for community evacuation plans.
4. Keep fuel in your car at all times. During emergencies, filling stations may be closed. Never store extra fuel in the garage.
5. If you do not have a car, make transportation arrangements with friends, neighbors or your local emergency management office.
6. Know how to shut off electricity, gas and water at main switches and valves. Make sure you have the tools you would need to do this (usually pipe, crescent, or adjustable wrenches). Check with your local utilities for instructions.

### **What to do when you are told to evacuate**

1. Listen to a battery powered radio and follow the instructions of local officials.
2. Wear protective clothing and sturdy shoes.
3. Gather water, food and emergency supplies. See the [Emergency Planning and Checklist](#) chapter for important information.

4. Close and lock doors and windows.
5. If there is time, secure your house.
  - Unplug appliances.
  - Turn off natural gas, propane, water and electricity if instructed to do so. In a flood hazard area, store propane tanks or secure them to the structure.
  - Turn off the main water valve.
  - Take any actions needed to prevent damage to water pipes by freezing weather, if this is a threat.
  - Let others know where you are going.
6. Follow recommended evacuation routes. Do not take shortcuts! They may be blocked.
7. Listen to the radio for emergency shelter information.
8. Carry a disaster supplies kit. See the [Emergency Planning and Checklist](#) chapter for important information.

### **Returning home**

1. Do not return to the emergency site until authorities say it is safe.
2. Continue listening to the radio for information and instructions.
3. Use extreme caution when entering buildings, structures may have been damaged or weakened. Beware of poisonous snakes in flooded structures and debris.
4. Do not take lanterns, torches or any kind of flame into a damaged building. There may be leaking gas or other flammable materials present. Use battery-operated flashlights for light.
5. If you smell leaking gas, turn off the main gas valve at the meter.
  - Do not turn on lights--they can produce sparks that will ignite the gas.
  - Leave the house immediately and notify the gas company or the police.
  - Do not reenter the house until all odor of gas is gone.
6. Notify the power company or fire department if you see fallen or damaged electrical wires.
7. If appliances are wet, turn off the main electrical power switch in your home before you unplug them. Dry out appliances, wall switches and sockets before you plug them in again--call utility companies for guidance.
8. Check food and water supplies for contamination and spoilage before using them. Follow specific instructions from your local health department or agriculture extension agency.
9. Wear sturdy shoes when walking through debris or broken glass, and use heavy gloves when removing debris.
10. After the emergency has passed, telephone or telegraph your family and friends to tell them you are safe.

### **For more information**

- Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publication. (Single copy requests only)

- Hosting in an Emergency (FEMA-183). Information for citizens who may be willing to host evacuees in an emergency.

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## **Shelter**

In 1989, following Hurricane Hugo and the Loma Prieta earthquake, the American Red Cross provided 200,000 beds in 806 shelters. Volunteer organizations served over 13 million meals.

Taking shelter is critical in times of disaster. This may mean taking immediate shelter in a basement during a tornado warning, staying inside an enclosed structure while a chemical cloud passes, or staying at home during a severe storm for several days without electricity, water and other basic services.

In many emergencies the American Red Cross, assisted by community and other disaster relief groups, will work with local authorities to set up public shelter in schools, municipal buildings and churches. They often provide water, food, medicine and basic sanitary facilities. But you should plan to have your own supplies as well--especially water. See the [Emergency Planning and Checklist](#) for more details.

### **Shelter living during an emergency**

1. Stay in your shelter until local authorities tell you it is permissible or advisable to leave. The length of your stay can range from a few days to as long as two weeks.
2. Smoking should be restricted to well-ventilated areas. Smoking creates a fire hazard and discomfort for non-smokers.
3. Cooperate with shelter managers and others staying in the shelter. Living with many people in a confined space can be difficult and unpleasant.
4. Maintain a 24-hour communications and safety watch. Take turns listening for important radio information. Watch for fires.
5. People may need to use improvised, emergency toilets if the water supply has been cut off. This kind of toilet consists of any water container with a snug-fitting cover.
  - Use a garbage container, pail or bucket. If the container is small, keep a large container (also with a cover) available for waste disposal. Line both containers with plastic bags.
  - After each use, pour or sprinkle a small amount of regular household disinfectant, such as chlorine bleach, into the container to reduce odors and germs.

### **Managing water supplies in a shelter**

1. Water is critical for survival. Save it for drinking and medical emergencies.
  - Allow people to drink according to their need. Each person's need will vary depending on age, physical activity, physical condition and time of year.



- The average person should drink between two and two-and-one-half quarts of water or other liquids per day, but many people need more. Plan to need one gallon of water per person per day. Under no circumstances should individuals drink less than one quart of water each day. It is better to use whatever water is available, in the hope of finding more, than it is to deprive people of what they need for survival, by rationing it.
- 2. In addition to water stored in containers, try other sources:
  - Ice cubes, milk, soft drinks, fruit and vegetable juices.
  - Water in the hot water tank (20, 59, 60 gallons).
  - Water in the flush tanks (not the bowls) of home toilets.
- 3. If local authorities advise it, turn off the main water valves in your home. This prevents water from draining away, in case of a break and loss of pressure in the water mains.
  - Even with the main valve closed. all the pipes in a house are still full of water.
  - To use this water, turn on the faucet at the highest point in your house (which lets air into the system). Then draw water, as needed, from the faucet located at the lowest point in your house.
- 4. First drink water that you know is uncontaminated. If necessary, suspicious water, such as cloudy water from regular faucets or muddy water from a nearby stream or pond, can be used after it has been purified. If water purification is not possible, put off drinking suspicious water as long as possible, but do not become dehydrated.

### **Purifying water supplies**

1. In addition to having a bad odor and taste, contaminated water can contain microorganisms that cause diseases such as dysentery, cholera, typhoid and hepatitis. You should therefore purify all water of uncertain purity before using it for drinking, food preparation or hygiene.
2. There are many ways to purify water. None are perfect. Often the best solution is a combination of methods. Before purifying, let any suspended particles settle to the bottom, or strain them through layers of clean cloth.
3. Following are four purification methods. The first three methods --boiling, chlorination and purification tablets--will kill microbes but will not remove other contaminants such as heavy metals, salts, most other chemicals and radioactive fallout. The final method--distillation, will remove microbes as well as other contaminants including radioactive fallout.

Boiling is the safest method of purifying water.

- Bring water to rolling boil for 10 minutes, keeping in mind that some water will evaporate. Let the water cool before drinking.
- Boiled water will taste better if you put oxygen back into it by pouring it back and forth between two containers. This will also improve the taste of stored water.

Chlorination uses liquid chlorine bleach to kill micro-organisms.

- Use liquid bleach that contains 5.25 percent sodium hypochlorite and not soap. Some containers warn, "Not for Personal Use". You can disregard these warnings if the label states sodium hypochlorite as the only active ingredient and if you use only the small quantities in these instructions.
- Add two drops of bleach per quart of water (four drops if the water is cloudy), stir and let stand for 30 minutes. If the water does not taste and smell of chlorine at that point, add another dose and let stand another 15 minutes.
- If you do not have a dropper, use a spoon and a square-ended strip of paper or thin cloth about 1/4 inch by 2 inches. Put the strip in the spoon with an end hanging down about 1/2 inch below the scoop of the spoon. Place bleach in the spoon and carefully tip it. Drops the size of those from a medicine dropper will drip off the end of the strip.

Purification tablets release chlorine or iodine. They are inexpensive and available at most sporting goods stores and some drugstores. Follow the package directions. Usually one tablet is enough for one quart of water. Double the dose for cloudy water.

Distillation involves boiling water and then collecting the vapor that condenses back to water. The condensed vapor may include salt or other impurities.

- Fill a pot halfway with water.
- Tie a cup to the handle on the pot's lid so that the cup will hang right-side-up when the lid is upside-down (make sure the cup is not dangling into the water).
- Boil the water for 20 minutes. The water that drips from the lid into the cup is distilled.

### **Managing food supplies**

1. Carefully ration everyone's food except that of children and pregnant women. Most people in shelter can get along with about half as much food as usual and can survive without food at all for several days, if necessary.
2. If your water supply is limited try to avoid foods that are high in fat and protein, since they will make you thirsty. Try to eat salt-free crackers, whole grain cereals and canned foods with high liquid content.
3. It is especially important to be sanitary in storing, handling and eating food.
  - Keep food in covered containers.
  - Keep cooking and eating utensils clean.
  - Keep all garbage in a closed container and dispose of it outside the home when it is safe to go outside. If possible, bury it. Avoid letting garbage or trash accumulate inside the shelter, both for fire and sanitation reasons.
4. For emergency cooking you can use a fireplace or heat food with candle warmers, chafing dishes and fondue pots. Charcoal grills and camp stoves are for outdoor use only.
5. Canned foods can be eaten right out of the can without warming. If you heat it in the

can, be sure to open the can and remove the label first.

- Do not eat from cans that have tops that are swollen even though the product may look and smell normal. A swollen can may be evidence of the growth of a bacteria that produces a deadly toxin.
- Do not eat food from cans where the contents have leaked out, as evidenced by dried food on the outside of the can or stained labels.
- Any food which looks or smells abnormal, even if in a normal appearing can, should not be consumed.

### **For more information**

- Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publications (Single copy requests only).
- *Hosting in an Emergency (FEMA-183)*. Information for citizens who may be willing to host evacuees in an emergency.
- *Below Ground Home Fallout Shelter (H-12-1)*. An outside underground fallout shelter.
- *Above Ground Home Fallout Shelter (H-12-2)*. An outside above-ground fallout shelter for use in areas with a high water table.
- *Home Blast Shelter - Underground Concrete Shelter (H-12-3)*. An outside, underground blast shelter.
- *Home Shelter - Below Ground Shelter (H-12-4)*. An outside, underground shelter that provides protection against nuclear fallout radiation and tornados.
- *Home Fallout Shelter - Modified Ceiling Shelter (H-12-A and H-12-B)*. Modified ceiling shelters in basements.

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## ***Emergency Planning and Checklists***

In a 1987 national survey, 26 percent of the people interviewed said that they had experienced some disaster such a tornado, flood or earthquake in their lifetimes.

Emergencies usually happen without warning. Immediately after an emergency, it is possible that essential services will be disrupted and disaster relief organizations and your local government may not be able to reach you right away. You will be able to respond to emergencies if you are prepared.

Begin by developing an emergency plan for your household. Use the following information as your guide. Then, contact your local emergency office and American Red Cross Chapter for more information.

### **Get Information**

1. Find out what types of natural disasters are most likely to happen in your community from your local emergency management or civil defense office and the American Red Cross chapter. Also, learn if hazardous materials are stored, manufactured or transported near your region. Find out what steps you should take to prepare for each emergency and how to respond. Also, ask how you would be warned in an emergency.
2. Talk with employers and school officials about their emergency response plans.

### **Create an Emergency Plan**

1. Meet with the other members of your household and discuss the need to prepare for emergencies. Explain how to prepare for and respond to different disasters. Talk about what to do if you were advised to evacuate the area.
2. Plan how your family would stay in contact if you were separated. Begin by identifying two meeting places outside of your home where your family would meet. The first should be a spot a safe distance from your home such as under a tree or at a neighbor's house in case of a fire. The second place should be outside of your neighborhood such as a park or building in case you cannot return home.
3. Pick a friend or relative out of the area that family members can call if separated. The friend or relative should be a far enough distance away from where you live so they most likely would not be affected by the emergency.
4. Draw a floor plan of your home. Mark two escape routes from each room.
5. Post emergency telephone numbers such as fire, police and ambulance by the telephones. Teach children how and when to call 911 for help.
6. Show responsible persons in your household how and when to shut-off water, gas and electricity at the main switches.
7. Take a Red Cross first aid and CPR class.
8. Consider how you would help your neighbors who may need special assistance, such as infants, the elderly or people with disabilities, in times of emergency.
9. Make arrangements for your pets. Animals may not be allowed into shelters following an emergency.

### **Emergency Planning for People with a Disability.**

1. Find out about any special assistance that may be available in your community. Call your fire department and ask to register for assistance, so needed help can be provided quickly in an emergency.
2. Create a network of neighbors, relatives, friends and co-workers to aid you in an emergency. Discuss with them your needs and make sure they know how to operate any necessary equipment.
3. If you live in an apartment building, ask the management to clearly mark accessible exits and to make arrangements to help you evacuate the building.
4. Keep extra wheelchair batteries, oxygen, catheters, medication, food for guide or hearing-ear dogs, or other items you might need. Also, keep a list of the model type and serial numbers of medical devices.

## **Emergency Supplies**

Emergency supplies listed in this chapter will help you and your family prepare for evacuation and stays in public shelters. You also need to be prepared if utilities are temporarily cut off or if hazardous conditions prevent you from leaving your home.

During most serious, non-nuclear emergencies, families may need to be self-reliant for about three days. Using the checklists that follow as guidelines, put together containers or "emergency kits" for each member of your family. The container kit should be small enough for an individual member of your family to carry easily. Try using buckets, backpacks or duffel bags.

### **Water: The Absolute Necessity**

1. Stocking water reserves should be among your top priorities in preparing for an emergency. Store at least a two-week supply of water for each member of your family.
  - o Everyone's needs will differ, depending upon age, physical condition, activity, diet and climate. A normally active person needs to drink at least two quarts of water each day. Heat can double that amount. Children, nursing mothers and ill people will need more. You will need additional water for food preparation and hygiene.
  - o Store at least one gallon of water per person per day.
2. Never ration water. Drink the amount you need today, and try to find more for tomorrow. You can minimize the amount of water your body needs by reducing activity and staying cool.
3. Store water in thoroughly washed plastic, glass, fiberglass or enamel-lined metal containers. Never use a container that has held toxic substances. Sound plastic containers, such as soft drink bottles, are best. You can also purchase food-grade plastic buckets or drums.
4. Before storing your water, treat it with disinfectant, such as chlorine bleach, to prevent the growth of microorganisms. Use liquid bleach that contains 5.25 percent sodium hypochlorite and no soap. Some containers warn, "Not For Personal Use." You can disregard these warnings if the label states sodium hypochlorite as the only active ingredient and if you use only the small quantities in these instructions.
  - o Add four drops of bleach per quart of water (or two scant teaspoons per 10 gallons), and stir.
  - o Seal your water containers tightly, label them and store them in a cool, dark place.

### **Food: Preparing an Emergency Stockpile**

1. If activity is reduced, healthy people can survive on half their usual food intake for an extended period and without any food for many days. Food, unlike water, may be rationed safely, except for children and pregnant women.
2. You don't need to go out and buy unfamiliar foods to prepare an emergency food

supply. You can use the canned foods, dry mixes and other staples on your cupboard shelves. Canned foods do not require cooking, water or special preparation.

3. Though it is unlikely that an emergency would cut off your food supply for two weeks, you should prepare a supply that will last that long. A two-week supply can relieve a great deal of inconvenience and uncertainty until services are restored.
4. Keep canned foods in a dry place where the temperature is fairly cool--not above 70 degrees Fahrenheit and not below freezing. To protect boxed foods from pests and extend their shelf life, store the boxes in tightly closed cans or metal containers.
5. Rotate your food supply. Use foods before they go bad, and replace them with fresh supplies, dated with ink or markers. Place new items at the back of the storage area and older ones in front.

## **Emergency Checklist**

1. Water, Food and Utensils
  - Water--one gallon of water per person per day, for drinking, cooking, washing and sanitation. Store as much water as possible in non-breakable containers, such as soft drink containers or milk jugs.
  - Food--non-perishable, needing little or no cooking, high nutrition-type with little waste.
  - Special dietary foods, if needed
  - Eating and drinking utensils, non-breakable
  - Bottle and can openers
  - Water purifying tablets, two percent tincture of iodine or household bleach (hypochlorite type only)
  - A heating source, such as a camp stove or canned heat stove, and extra fuel
2. Communication, lighting, safety
  - Battery-operated radio
  - Extra batteries
  - Lantern and fuel
  - Flashlights, candles
  - Fluorescent distress flag
  - Matches (in waterproof container)
  - Citizen's Band radio
  - Fire extinguisher
  - Work gloves
  - Shovel
3. Clothing and bedding
  - One complete change of clothing for each person, appropriate for season and weather conditions
  - Sturdy work clothes
  - Sturdy shoes
  - Extra socks
  - Extra underwear
  - Outer-wear: rain gear, coats, jackets, boots, ponchos

- Pillows
- A sleeping bag or two blankets per person
- 4. Personal Items
  - Washcloth and small towel
  - Reading and writing materials
  - Sewing kit
  - Soap, toothbrushes, toothpaste, deodorant
  - Small toys for children
  - Hair care items
  - Insect repellent and insecticide
  - Mirror
  - Contact lens solution
  - Dentures
  - Shaving kit
  - Sanitary napkins and tampons
- 5. Sanitary needs
  - Paper towels and toilet paper
  - Liquid detergent
  - Disinfectant
  - Garbage can or bucket with tight-fitting lid (for emergency toilet)
  - Plastic garbage bags (for lining toilet)
- 6. Baby supplies, if needed
  - Clothes
  - Diapers
  - Milk or formula
  - Powders, creams or ointments
  - Bottles and nipples
  - Food
  - Small toys
  - Sheets, Blankets, rubber pads
  - Portable crib
- 7. First aid supplies
  - Keep contents of first aid kit in a waterproof metal or plastic box. Keep medicines tightly capped. Check periodically and replace any medication which has passed its expiration date.
    - Adhesive tape rolls, two inches wide.
    - Applicator--sterile, cotton tips
    - Antacid
    - Antibiotic ointments
    - Antiseptic solution
    - Aspirin or aspirin substitute
    - Baking soda
    - Bandage--sterile roll, two inches wide
    - Bandage--Sterile roll, four inches wide
    - Bandages--large triangular, 37 inches by 37 inches, by 52 inches
    - Bandage--plastic strips, assorted sizes

- Cotton balls
- Diarrhea medication
- Eye medication
- First aid handbook
- Hot water bag
- Ice bag
- Iodine water purification tablets
- Isopropyl alcohol
- Laxatives
- Medical items such as spare eye glasses, contact lens needs, hearing-aid batteries, etc.
- Medical alert tags, if needed for epilepsy, drug allergies, etc.
- Medicine dropper
- Motion sickness tablets for nausea
- Non-prescription medicines
- Nose drops (water soluble)
- Petroleum Jelly
- Plastic bags with fasteners
- Prescription medicines (insulin, heart pills, etc., as needed)
- Safety pins--assorted sizes
- Scissors
- Smelling salts
- Antibacterial soap
- Splints--wooden, 18 inches long
- Table salt
- Toothache remedy
- Thermometer
- Tweezers

#### 8. Paper and valuables

- Social Security cards
- Birth certificates
- Marriage and death records
- Driver's license
- Cash and credit cards
- Wills
- Insurance policies
- Deeds
- Stock and Bonds
- Savings and checking account books
- Inventory or household goods (photos preferred)
- Small valuables: cameras, watches, jewelry, etc.

#### 9. Library

- Newspaper or emergency public information articles
- Plans for expedient shelters
- Medical self-help books
- Civil defense manuals



- Survival books
- Other reading materials

**For more information:**

- Contact your local emergency management or civil defense office or write to the Federal Emergency Management Agency P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications, for the following publications. (Single copy requests only)
- FEMA Publications Catalog (FEMA-20). This catalog lists FEMA publications designed to help citizens plan for and respond to disasters and emergencies of all types.
- Emergency Preparedness Checklist (L-154). Also available in Braille or recorded versions. This pamphlet provides general information for personal and family preparedness for a variety of natural and manmade disasters.
- Your Family Disaster Supplies Kit (L-189). This pamphlet provides detailed information on assembling a kit of emergency supplies before disaster strikes.
- Your Family Emergency Plan (L-191). This pamphlet provides step-by-step information on developing an emergency plan for families and individuals.
- Coping with Children's Reactions to Hurricanes and Other Disasters (FEMA-184) Spanish Edition (FEMA-185). This pamphlet is designed to help parents deal with children's fears and anxiety following a disaster.
- Emergency Food and Water Supplies (FEMA-215). This brochure provides information on how to choose the correct foods for an emergency kit, where to locate emergency water sources in the home and how to cook if the power goes out.
- To obtain the following Home Study Courses, write to: FEMA Home Study Program, Administration Office, Emergency Management Institute, 16825 South Seton Avenue, Emmitsburg, MD 21727
- The EMI Home Study Course Brochure (L-173). This brochure lists all home study courses offered by FEMA's Emergency Management Institute.
- Emergency Management, U.S.A.--Home Study Course (HS-2). This pamphlet is used to enroll in a home-study course that describes natural and technological hazards and the nuclear attack threat. The course leads the individual through the development of personal emergency preparedness plans and encourages volunteer participation in the emergency management network.
- Preparedness Planning for a Nuclear Crisis: A Citizen's Guide to Civil Defense and Self Protection--Home Study Course (HS-4). This pamphlet is used to enroll in a home study course that covers the effects of nuclear weapons, evacuation and sheltering, preparing and stocking a fallout shelter, and how to develop emergency plans to improve the chances of surviving a nuclear attack.
- Radiological Emergency Management Home Study Course (HS-3). This pamphlet is used to enroll in a home study course covering response strategies to radiological emergencies, nuclear power plant accidents and nuclear attack.
- Hazardous Materials: A Citizens Orientation--Home Study Course (HS-5). A pamphlet providing information and an application to enroll in this home study course.

- The following publications are available by writing the National Weather Service, 1325 East West Highway, Silver Spring, MD 20910, (301) 713-0090.
- Public's Guide to General Weather Information, #79013
- Dust Storm Driving Safety (wallet card), #82002
- Watch Out Storms Ahead, #82004.
- Heat Wave, #85001.
- Are You Ready? Publications Order Form

**To order FEMA Publications listed in this booklet:**

1. Locate the FEMA publications you are interested in receiving.
  - Publications about specific topics such as tornadoes or winter storms are listed on the last page of each chapter. Publications about general emergency preparedness and response topics are listed on page 93. To obtain publications from other sources identified in this booklet such as the National Weather Service, write to each organization directly. These publications cannot be ordered with this form.
2. Write the FEMA publication number and title on the order form.
  - Emergency Preparedness Checklist (L-154). Also available in Braille or recorded versions. This pamphlet provides general information for personal and family preparedness for a variety of natural and manmade disasters.
3. Complete the Mailing Address Form.
4. Send this form to:

FEMA  
Attn: Publications  
P.O. Box 70274  
Washington, DC 20024