WHAT YOU SHOULD KNOW ABOUT NUCLEAR PREPAREDNESS

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The purpose of this publication is to answer commonly asked questions about nuclear attack. It does not discuss various peacetime hazards. If you want that information, you should ask your local or state emergency services (civil defense) office for the handbook In Time of Emergency (H-14), published by the Federal Emergency Management Agency. If not available locally, H-14 may also be obtained by writing to the Federal Emergency Management Agency, Attention: "In Time of Emergency," Box 8181, Washington D.C. 20024.

In addition to the general nuclear survival information contained in this publication, you should ask your local or state emergency services (civil defense) office for survival information specific to your area.

What warning would be given of a nuclear attack?

There are two standard warning signals which have been adopted in most communities. The Attention or Alert Signal is used by some local governments to get citizens to turn on a radio or television to get important information about peacetime emergencies. The Attack Warning Signal is used to warn of an actual enemy attack.

The ATTENTION OR ALERT SIGNAL is a 3- to 5-minute steady blast on sirens, whistles, horns, or other devices.

If you should hear the Attention or Alert Signal, turn on a radio or TV set, tune in to any local station, and follow the official instructions being broadcast.

The ATTACK WARNING SIGNAL is a 3- to 5-minute wavering sound on sirens, or a series of short blasts on whistles, horns or other devices, repeated as necessary.

If you should hear the Attack Warning Signal--unless your local government has instructed you otherwise--go immediately to your home fallout shelter or to your basement. Turn on a radio, tune it to any local station that is broadcasting, and listen for official information. Follow whatever instructions are given. If you are not near any shelter, find a protected place below ground (such as a road culvert) where you can take cover from the blast wave and heat flash, then get to a shelter as quickly as possible. Light would reach you before the heat and blast. Cover your eyes, and do not look at the flash; it can cause blindness.

What happens when a nuclear weapon explodes?

The direct effects of a nuclear weapon exploding are intense light (flash), heat, blast, and initial radiation. Figure 1 on page 8 is an example of the blast and fire effects of a one megaton nuclear detonation.

In addition, explosions that are on or close to the ground would create large quantities of dangerous radioactive fallout particles. Areas close to a nuclear explosion might receive fallout within 15 to 30 minutes. On the other hand, it might take 5 to 10 hours or more for the particles to drift down on a community 100 or 200 miles away.

Are there other effects of a nuclear detonation?

An additional effect which can be created by high altitude nuclear detonations is called electromagnetic pulse, or EMP. A nuclear weapon exploding just above the earth's atmosphere could result in damage to electrical and electronic equipment for thousands of miles. It has no direct effect on living things.

EMP is electrical in nature and is roughly similar to the effects of a nearby lightning stroke, but it is stronger, faster, and briefer than lightning. EMP charges are collected by typical conductors of electricity, such as cables, antennas, powerlines, buried pipes or cables, etc. Basically, anything electronic which is connected or tuned to its power source or antenna at the time of such a detonation could be affected. The damage could range from minor interruption of function to actual burnout of components.

Equipment with solid state devices, such as televisions, stereos, and computers, could be protected from EMP by disconnecting them from power lines, telephone lines, or antennas if nuclear attack is thought to be likely. Battery-operated portable radios are not affected by EMP, nor are car radios if the antenna is down. Some cars with electronic ignitions might be disabled by EMP and would require mechanical adjustments.

What is fallout?

Fallout is the result of a nuclear weapon exploding near the ground. When the weapon goes off, pulverized earth and other debris are sucked up into the nuclear cloud. There the radioactive gases produced by the explosion condense on and into this debris, producing radioactive fallout particles.

The larger, mainly granular particles fall back to earth within 24 to 48 hours. On the way down, and after they reach the ground, they continue to give off invisible rays--like strong X-rays. Since the heavier, more radioactive particles come down first, the first 24 hours after fallout settles would be the most dangerous. Smaller, dust-like particles falling perhaps months or years later would lose most of their radioactivity while still high in the atmosphere.

Early fallout particles can be seen. They range in size from those that look like grains of sand to those that appear as fine dust.

Fallout arriving within several hours after a nuclear explosion is highly radioactive. It is the radiation given off by fallout particles that can cause radiation sickness or death. Also, if fresh fallout particles collect on the skin in large enough quantities, they can cause burns. The radiation will pass through your body, much like an X-ray, damaging cells on the way. However, your body will not "hold" the radiation. Radiation sickness is not transmitted from one person to another like an infection; it is caused by damage to body cells from exposure to radiation from fallout particles. If you are caught outside when fallout begins, remove all fallout particles quickly from skin, hair, and clothing.

The body can repair itself and get well if the damage from the radiation exposure is not too great. The same exposure received over a short period of time is more damaging than if it is received over a longer period. Usually, the effects of a given exposure of radiation are more severe in very young and very old persons, and those not in good health -- radiation tends to lower resistance to disease and their resistance is already lower.

Similarly, radiation itself does not make food and water radioactive. It is the fallout particles which contaminate food. Containers or food which can be cleansed of sand could be cleansed of fallout particles. Fallout particles falling in water would for the most part not dissolve, but settle to the bottom of a container, reservoir, etc. Most of the fallout could be removed by filtering the water. Water in wells, tanks, and pipes would not be exposed to fallout particles, and would remain drinkable.

Are there any ways of protecting myself from fallout?

There are three major factors that can protect you from fallout: distance, mass, and time.

(1) The more distance between you and the fallout particles, the less radiation you will receive.

(2) The more heavy, dense materials between you and the fallout particles, the better. Materials such as concrete, bricks, and earth will absorb much of the radiation and keep it from reaching you.

(3) Fallout radiation decays fairly rapidly.* As time passes, the radioactivity in fallout loses its intensity. In an attack, shelter occupancy would be required for a few days to a week or two. In some areas of heavier fallout, it might be necessary to remain in shelter for a longer time.

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* The "decay" of fallout radiation is expressed by the so-called "seven-ten" rule. This is that for every sevenfold increase in time after the explosion, the dose rate decreases by a factor of ten. For example, if the radiation dose rate at 1 hour after the explosion is at a given level, then at 7 hours after the explosion the dose rate will have decreased to one-tenth as much. After another sevenfold passage of time (7 x 7 = 49 hours, or roughly 2 days), it will have decreased to one-hundredth (1 percent) of the 1-hour rate. After roughly 2 weeks, the dose rate will be one-thousandth of that at 1 hour after the blast.

When would it be safe to leave shelter?

The intensity of radiation in your area would determine when you would be able to leave shelter. Intensity would depend on many factors including the number of weapons used, weapon size, whether they were ground or air bursts, weather conditions, and the duration of the attack. Special instruments are needed to detect fallout radiation and to measure its intensity. Instruments have been distributed to local authorities through the states. States provide proper maintenance and calibration to assure the instruments are in good working order. Unless you have a set of radiation detection instruments and know how to use them, you will have to depend on your local government to tell you when it is safe to leave shelter. This information would probably be given on the radio, which is one reason why you should keep a battery-powered radio in your shelter area.

Aren't there special places on the radio to tune for emergency information?

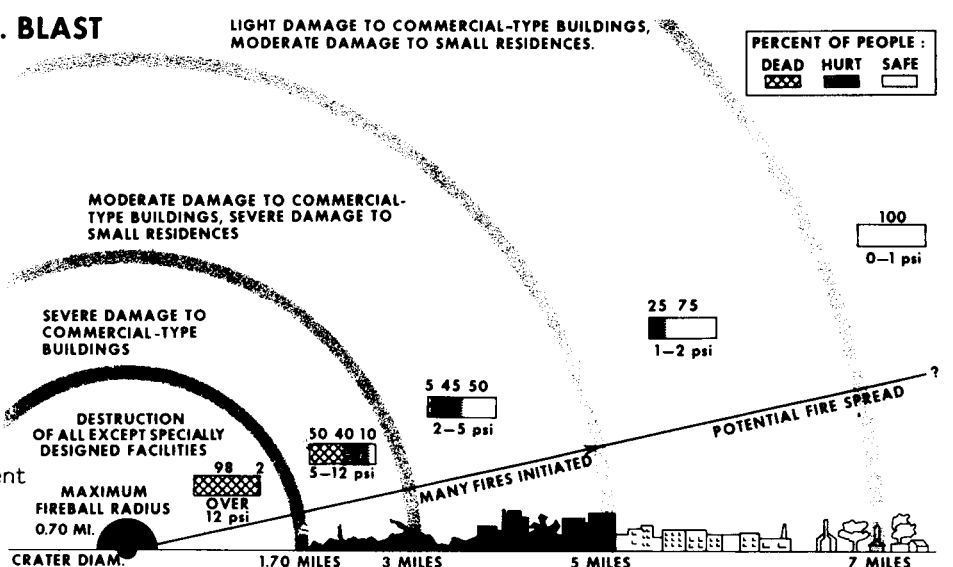
There are no longer any specifically designated frequencies for emergency information. Tune in to any local radio or television station to obtain emergency information over the Emergency Broadcast System.

What can I do in peacetime to improve my chances of survival if there were a nuclear attack?

First of all, read and understand available survival information. This publication contains survival information which can generally be used anywhere in the United States. Second, ask your local or state emergency services (civil defense) office for additional survival information unique to your locality. Especially, make sure you know the signals used in your community to indicate alert and attack.

DIRECT EFFECTS OF 1 MT. BLAST (SURFACE BURST)

This shows the approximate direct effects a one (1) megaton nuclear detonation would produce on a city built on flat land if the burst occurred at or near ground level on a clear day. "Megaton" means the equivalent of one million tons of TNT high explosive.



IF BURST IS ELEVATED TO ALTITUDE MAXIMIZING THE REACH OF BLAST DAMAGE, MODERATE DAMAGE FROM BLAST AND INITIAL FIRES ON A CLEAR DAY ARE EXTENDED FROM 5 MILES TO 8 MILES.

Figure 1

Should I build a home shelter?

It depends on where you live. If you live in a small town or rural area away from large cities or major military or industrial centers, the chances are you might not be threatened by blast, but by radioactive fallout from an attack. In such a place, a home fallout shelter could be constructed and would give you good protection.

In metropolitan suburban areas, you would need to build an outside underground blast shelter or plan to evacuate to a safer area.

Are there published plans available to build home shelters?

Yes. There are detailed plans to construct home shelters available from your local or state emergency services (civil defense) office or by writing to the Federal Emergency Management Agency, Attention: Shelter Plans, P.O. Box 8181, Washington, D.C. 20024. Outside underground fallout and blast shelter plans as well as home basement fallout shelter plans are available. A list identifying such plans by title and number is at the back of this publication. Keep in mind when requesting plans that a fallout shelter will protect you from fallout only; a much stronger shelter must be constructed to protect against blast effects.

Should I lay in an emergency supply of food and other supplies?

It's a good idea for peacetime as well as war-related emergencies. Following is a checklist of the most essential supplies:

Water (a 14-day supply is recommended)

Food (a 14-day supply of non-perishable foods is recommended)

Sanitation Supplies (soaps, emergency toilet)

Portable Radio (with extra batteries)

Medicines

Eating Utensils/Can Opener

First Aid Kit/Manual

Extra Clothing/Work Gloves

Bedding

Tools and Equipment (shovel, broom, axe, crowbar, kerosene lantern, short rubber hose for siphoning, coil of half-inch rope at least 25 feet long, coil of wire, hammer, pliers, screwdriver, wrench, nails, and screws)

Fire Fighting Equipment (fire extinguisher, buckets filled with sand, a ladder, and a garden hose)

What personal preparedness measures can I take if it looks like nuclear war is possible?

The most important is to be informed. Keep abreast of the news through the media. Know the Attack Warning Signal and what you must do quickly if it sounds. Listen for emergency information being broadcast or watch for printed information such as a newspaper supplement for your area. Take an inventory of essential supplies in your home which would be needed if you had to take shelter or evacuate. Buy what you need, but not more than you need.

What if I am asked to evacuate?

The farther away you are from the direct effects of nuclear weapons--light, heat, blast, and initial radiation--the better your chances of survival. If local authorities ask you to evacuate, it is because you are located in an area more likely to be attacked. Listen to instructions carefully and follow them as quickly and calmly as you can. Take the supplies that will be needed--water, food, medicines, a portable radio and extra batteries, extra clothing, work gloves, and basic tools such as shovels that might be needed to improvise fallout protection.

Planning in many areas across the country has been in progress for several years to

expedite evacuation of those living in areas likely to be nuclear targets. Local authorities are responsible for such planning because only they are familiar with local factors that would affect evacuation. To find out about such planning in your area, you should contact your local or state emergency services (civil defense) office.

What should I do if I am asked to take shelter?

A fallout shelter is any building that offers enough "shielding material" to provide protection against the penetrating radiation being given off by fallout. It can be any space, if the walls and roof are thick and dense enough to absorb the rays given off by the fallout particles outside. A fallout shelter should not be confused with a blast shelter. A fallout shelter would not protect you from a nearby nuclear blast. Blast protection requires a shelter strong enough to resist blast pressure, initial radiation, heat, and fire as well as radioactive fallout. There are few structures in the United States which presently provide such protection.

If you are asked to take shelter you would have two options: go to a nearby public shelter or take best available shelter in your home.

Existing public shelters are fallout shelters; they will not protect against blast. They are located in larger public buildings and are marked with a standard yellow-and-black fallout shelter sign. But additional shelter areas can be found in subways, tunnels, basements, or the center, windowless areas of middle floors in high-rise buildings.

In many places--especially suburban and rural areas--there are few public shelters. Potential shelters in rural areas are mines and caves. But, if there are none near you, improvising a shelter in your home could save your life.

To improvise a shelter, you would need heavy shielding materials such as concrete

blocks, bricks, sand, or earth. Other things could also be used as shielding material, or to support shielding material, such as: heavy house doors; dresser drawers or trunks, boxes, and cartons filled with sand or earth after they are placed in position; tables and bookcases; books, magazines, and stacks of firewood or lumber; flagstones or bricks from outside walks and patios.

For comparative purposes, 4 inches of concrete would provide the same shielding density as:

--5 to 6 inches of bricks
--6 inches of sand or gravel
--7 inches of earth
--8 inches of hollow concrete blocks
--10 inches of water
--14 inches of books or magazines
--18 inches of wood

If your home basement--or one corner of it--is below ground level, that would make a good area in which to improvise a shelter. Set up a large sturdy table or workbench in the corner of your basement that is most below ground level. Pile as much shielding material on top of the table as it will hold without collapsing. Use dresser drawers or boxes; fill them with earth, bricks, or other shielding material after they are in place. Then put as much shielding material around the table as possible. When everyone is inside--that is, under the table--block the opening with other shielding material.

If a large table or workbench is not available, or if more shelter space is needed, place furniture or large appliances in the corner of the basement to serve as the "walls" of the shelter. As a "ceiling," use heavy doors from the house that have been taken off their hinges. Pile as much shielding material on top of the doors as they will support, and stack other shielding material around the "walls" of the shelter. Take your survival supplies inside the shelter, and then block the entrance with more heavy material.

If your home does not have a basement, you can improvise a fallout shelter by setting up a

large table in the center of the house on the lowest floor. Piling shielding material on top of the table and around each side would offer some protection from fallout radiation. Also, storm cellars and crawl spaces can be modified and reinforced for fallout protection.

What if I have questions that are not addressed in this publication?

For further information, you should contact your state or local office of emergency services (civil defense). Also, your local library may have more detailed information on many of the topics covered in this booklet.

SHELTER PLANS

The following detailed plans are available without charge from your local or state civil defense (emergency services) office or by writing to the Federal Emergency Management Agency, P.O. Box 8181, Washington, D.C. 20024 Attention: Shelter Plans. (Please refer to title and number when requesting plans.)

Home Shelter (H-12-1) -- an outside underground fallout shelter.

Aboveground Home Shelter (H-12-2) -- an outside aboveground fallout shelter for use in areas with a high water table.

Home Blast Shelter (H-12-3) -- an outside underground blast shelter.

Home Fallout Shelters (H-12-A or H-12-B) -- modified ceiling shelters in basements.

Home Fallout Shelter (H-12-C) -- small basement corner shelter.

Keep in mind that only the Home Blast Shelter (H-12-3) provides protection from blast; all the other plans listed provide fallout protection only.