

## Section 5: Maintaining Readiness

### Topic 22

### Health and Safety

#### Objectives

##### Welcome to Topic 22.

This topic will help you make informed decisions that will protect your own health and safety and that of your family in a disaster environment.

##### Student Preparation required:

None.

#### Introduction

Safety begins with a proper attitude. Make it a habit to plan your work carefully and always consider the safety aspects of your ham radio activities. It is also important to learn as much as possible about what *could* go wrong so we can avoid factors that might result in accidents. Amateur Radio activities are not inherently hazardous, but as with many things in modern life, it pays to be informed. Stated another way, while we long to be creative and innovative, there is a need to act responsibly. A good attitude toward safety also requires us to be knowledgeable about common safety guidelines and follow them faithfully.

While the following web pages may offer some important safety guidelines, you should not consider them to be a comprehensive discussion on this topic. Guidelines can't possibly cover all situations you might encounter, but if you approach a task with a measure of common sense, you should be able to work safely.

Be sure to review the information found on the following web pages:

[www.arrl.org/electrical-safety](http://www.arrl.org/electrical-safety)

[www.arrl.org/grounding](http://www.arrl.org/grounding)

[www.arrl.org/lightning-protection](http://www.arrl.org/lightning-protection)

[www.arrl.org/rf-exposure](http://www.arrl.org/rf-exposure)

[www.arrl.org/grounding-and-bonding-for-the-amateur](http://www.arrl.org/grounding-and-bonding-for-the-amateur)

There are additional texts and ARRL publications that provide information on safety guidelines and practices. Learning about safety should be an ongoing process. *Always remember: There is no substitute for common sense.*

## **Safety Begins at Home**

Disaster relief volunteers sometimes become so involved with helping others that they forget to take care of their own families and themselves. The needs of disaster survivors seem so large when compared with their own that volunteers can feel guilty taking even a moment for their own basic personal needs. However, if you are going to continue to assist others, you need to keep yourself in good condition. If you do not, you risk becoming part of the problem. If your family is not safe and all their needs are not taken care of, worrying about them may prevent you from concentrating on your job.

## **Home and Family First**

Before leaving on an assignment, be sure you have made all necessary arrangements for the security, safety, and general well-being of your home and family. Family members and perhaps friends or neighbors should know where you are going, when you plan to return, and a way to get a message to you in an emergency. If you live in the disaster area or in the potential path of a storm, consider moving your family to a safe location before beginning your volunteer duties. Take whatever steps you can to protect your own property from damage or looting and let some neighbor or even local police know where you are going, when you plan to return, and how to reach you or your family members in an emergency. Also refer to FEMA's guidance on developing a family emergency communications plan.

In addition to your emergency communications deployment checklists, you might want to create a home and family checklist. FEMA has many resources on building a basic disaster kit for the home and family.

## **Whether You Should Leave**

First and foremost, follow the directions of local officials regarding evacuation or sheltering. There are times when your family may need you as much or more than your emergency communications group does. Obviously, this is a decision that only you and your family can make. If a family member is ill, your spouse is unsure of their ability to cope without you, if evacuation will be difficult, or any similar concern arises, staying with them may be a better choice. *If there is ever any doubt, your decision must be to stay with your family.* This is also something you should discuss and come to an agreement about with your spouse well before any

disaster, in order to avoid any last-minute problems.

## **You First — The Mission Second**

Once you are working with your emergency communications group, you will need to continue to take care of yourself. If you become overtired, ill, or weak, you cannot do your job properly. If you do not take care of personal cleanliness, you may be unpleasant to be around. Whenever possible, each station should have at least two operators on duty so that one can take a break for sleep, food, and personal hygiene. If that is not possible, work out a schedule with the emergency communications managers or your NCS to take periodic “off-duty” breaks.

## **Food**

Most people need at least 2,000 calories a day to function well. In a stressful situation, or one with a great deal of physical activity, you may need even more. Experienced emergency communications managers and partner personnel will usually be aware of this issue and take steps to see that their volunteers’ needs are met. If you are at a regular shelter, at least some of your food needs may be taken care of. In other situations, you may be on your own, at least for a while. High-calorie and high-protein snacks will help keep you going, but you will also need food that is more substantial.

## **Water**

Safe water supplies can be difficult to find during and after many disasters. You will probably use three to five gallons of water each day just for drinking, cooking, and sanitation. In extremely hot or cold conditions, or with increased physical activity, your needs will increase significantly. Most disaster preparedness checklists suggest at least one gallon per person, per day.

Many camping supply stores offer a range of water filters and purification tablets that can help make local water supplies safer. However, they all have limitations you should be aware of.

Filters may or may not remove all potentially harmful organisms or discoloration, depending on the type. Those with smaller filter pores (.3 microns is a very tight filter) will remove more foreign matter but will also clog more quickly. Iodine-saturated filters will kill or remove most harmful germs and bacteria but are more expensive and impart a faint taste of iodine to the water. Most filters will remove Giardia cysts. All water filters require care in their use to avoid cross-contamination of purified water with dirty water.

Purification tablets have a limited shelf life that varies with the type and gives the water an unpleasant taste. The tablets will do nothing for particulate (dirt) or discoloration in the water. Be sure to read and understand the information that comes with any water purification device or tablet before purchasing or using it.

The CDC says you can use unscented household chlorine bleach. After filtering out any particulates by pouring the water through several layers of densely woven cloth, put 1/8 teaspoon of bleach in a gallon of water, mix well, and allow it to sit for 30 minutes. If it still smells slightly of bleach, you can still use it.

If you have no other means, boiling for at least five minutes will kill any bacteria and other organisms, but will not remove any particulate matter or discoloration. Boiling will leave water with a “flat” taste that can be improved by pouring it back and forth between two containers several times to reintroduce some oxygen.

## **Sleep and Personal Hygiene**

Try to get at least six continuous hours of sleep in every 24-hour period, or four continuous hours and several shorter naps. Bring fresh soft foam earplugs and a black eye mask to ensure that light and noise around you are not a problem. An appropriate sleeping bag, closed-cell foam pad, or air mattress, and your own pillow will help give you the best chance of getting adequate rest. If caffeine keeps you awake, try to stop drinking coffee, tea, or other beverages containing caffeine at least four hours before going to bed. Allowing yourself to become overtired can also make falling asleep difficult. This is a good subject to learn from the Amateur Radio contest community. DX contests can run up to 48 hours, and the top operators must master sleep strategies to be competitive.

If you pack only a few personal items, be sure they include toothpaste and toothbrush, a comb, and deodorant. If possible, bring a bar of soap or waterless hand cleaner, a small towel and washcloth, and a few extra shirts. Waterless shampoo is available from many camping stores. After 2 or 3 days without bathing, you can become rather unpleasant to be around, so think of others and make an attempt to stay as clean and well-groomed as you can under the circumstances.

## **Safety in an Unsafe Situation**

Many disaster assignments are in unsafe places. Natural disasters can bring flying or falling debris, high or fast-moving water, fire, explosions, building collapse, polluted water, disease, toxic chemicals, and a variety of other dangers. While you may focus on the job assigned you, never lose “situational awareness.” You should always be aware of your surroundings and the dangers they hold. Never place yourself in a position where you might be trapped, injured, or killed. Try to anticipate what might happen and plan ahead. Always have an escape plan ready in the event that conditions suddenly become dangerous. Do not allow yourself to become “cornered” — always have *more than one* escape route from buildings and hazardous areas.

Wear appropriate clothing. Depending on the weather, your gear might include a hard hat, rain gear, warm non-cotton layers, work gloves, and waterproof boots. In sunny climates, include a shade hat, long-sleeved shirt, long pants, and sunscreen. Always bring several pairs of non-cotton socks and change them often to keep your feet clean and dry. Create seasonal clothing lists suitable for your climate and the types of disasters you might encounter. As a volunteer

communicator, you will not generally be expected to enter environments that require specialized protective clothing or equipment. Do not worry about purchasing these items unless required by your partners.

Be prepared to help others find or rescue you should you become trapped or isolated. Carry a police or signal whistle and a chemical light stick or small flashlight in your pocket. Let others know where you are going if you must travel anywhere, even within a “safe” building. Try not to travel alone in dangerous conditions — bring a “buddy.”



## Shelter

In most cases, you will not need your own shelter for operating or sleeping. You may be able to stay or work in the emergency operations center, evacuation shelter, or even your own vehicle. However, in some cases a tent, camp trailer, motorhome, or other suitable shelter may be necessary. Your choice will depend on your needs, resources, and what is allowed at your work location.

Tents should be rated for high winds and should be designed to be waterproof in heavy weather. Most inexpensive family camping tents will not survive difficult conditions. Dome tents will shed wind well but look for published “wind survival” ratings since not all dome designs are equal. Your tent should have a full-coverage rain fly rather than a single waterproof fabric. The tent’s bottom should be waterproof, extending up the sidewalls at least six inches in a “bathtub” design, but bring an extra sheet of plastic to line the inside just in case. (Placing a plastic ground cloth under a tent will allow rain to quickly run under and through a leaky tent floor.) Bring extra nylon cord and long ground stakes to help secure the tent in windy conditions. If you are not an experienced foul-weather camper, consider consulting a reputable local outfitter or camping club for advice on selecting and using a tent.



## **Medical Considerations**

If you have a medical condition that could potentially interfere with your ability to do your job, it is a good idea to discuss this with your physician ahead of time. For instance, if you are a diabetic, you will need to avoid going for long periods without proper food or medication, and stress may affect your blood sugar level. Those with heart problems may need to avoid stressful situations. Even if your doctor says you can participate safely, be sure you have an adequate supply of appropriate medications on hand and a copy of any prescriptions. Let your emergency communications manager and any work partners know of your condition so that they can take appropriate actions if something goes wrong. Wear any medical ID jewelry you have. Keep a copy of any special medical information and emergency phone numbers in your wallet at all times. We know you want to help, but your EC needs to know and can make an appropriate assignment. Bring an electronic copy stored on your phone or a USB drive as a backup to the paper documents.

## **Protect Your Eyes and Sight**

If you wear eyeglasses, be sure to bring a spare pair or enough contact lenses to last through the deployment. If you use disposable contact lenses, bring more than enough changes to avoid running out. Some contact lens wearers may want to switch to glasses to avoid having to deal with lens removal and cleaning under field conditions. If you have any doubts, consult your eye doctor ahead of time. Bringing a copy of your lens prescription along may also be a good idea, especially if you are likely to be some distance from home for a while.

Sunglasses may be a necessity in some situations and should always be carried in sunny climates. Working without them in bright sun can cause fatigue, and possibly eye damage. If you are in an area with large expanses of snow or white sand, prolonged periods of exposure can cause the retina to be burned, a very painful condition commonly known as “snow blindness.” Since no painkiller will help with retinal burns, it is best to use good-quality UV blocking sunglasses at all times and avoid prolonged exposure. If you do not normally wear eyeglasses, consider a pair of industrial safety glasses or goggles to protect your eyes from smoke and ash, wind-blown water, dust, and debris. Keep all spare eyeglasses or safety glasses/goggles in a felt-lined, hard-shell storage case to prevent scratching and breakage.

## **Sample Personal Survival and Comfort Needs Checklist**

Modify according to your own situation.

- ✓ Suitable size backpack or duffel bag for clothing and personal gear
- ✓ Plastic storage tub for food, cooking gear
- ✓ Toilet kit — soap, comb, deodorant, shampoo, toothbrush, toothpaste
- ✓ Toilet tissue in zipper-lock freezer bag
- ✓ Small towel and washcloth
- ✓ Lip balm

- ✓ Facial tissues
- ✓ Sunscreen
- ✓ Insect repellent
- ✓ Prescription medications (1-week supply)
- ✓ Copies of medication and eyeglass/contact lenses
- ✓ Prescriptions
- ✓ Spare eyeglasses or contact lenses and supplies
- ✓ Hand lotion for dry skin
- ✓ Small first aid kit
- ✓ Non-prescription medications, including painkiller, antacids, anti-diarrheal, etc.
- ✓ Extra basic clothing — shirts, socks, underwear
- ✓ Gloves for protection or warmth
- ✓ Pocket flashlight
- ✓ Folding pocketknife
- ✓ Sleeping bag, closed-cell foam pad or air mattress, pillow
- ✓ Earplugs (soft foam-type in sealed package)
- ✓ Opaque eye mask
- ✓ Outer clothing for season and conditions (rain gear, parka, hat, face mask, etc.)
- ✓ Hardhat
- ✓ Reflective vest, hat
- ✓ Travel alarm clock
- ✓ Chemical light sticks
- ✓ Police or signal whistle
- ✓ Dust masks
- ✓ Phone/e-mail/address list for family, friends, neighbors, physician, pharmacy
- ✓ Emergency contact/medical information card in your wallet
- ✓ Spare car and house keys
- ✓ High-energy or high-protein snacks
- ✓ Food — freeze-dried or MREs
- ✓ Coffee, tea, drink mixes
- ✓ Plate or bowl, knife, fork and spoon, insulated mug
- ✓ Camp stove, small pot, fuel and matches
- ✓ Battery or other lantern
- ✓ Water in heavy plastic jugs
- ✓ Water purification filter or tablets
- ✓ Magnetic compass, maps
- ✓ Duct tape, parachute cord

Pack individual items or kits in zipper-lock freezer bags to keep dry, clean, and neat.

## **Reference Links**

*American Red Cross – Disaster Safety*

[www.redcross.org/get-help/prepare-for-emergencies/types-of-emergencies](http://www.redcross.org/get-help/prepare-for-emergencies/types-of-emergencies)

*Center for Disease Control and Prevention*  
[www.cdc.gov/](http://www.cdc.gov/)

*CDC Guidance on Water Purification*  
[https://www.cdc.gov/healthywater/drinking/travel/emergency\\_disinfection.html](https://www.cdc.gov/healthywater/drinking/travel/emergency_disinfection.html)

*Communications Tower Best Practices Guide*  
[http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2017/db0601/DOC-345150A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0601/DOC-345150A1.pdf)

*FEMA Build a Kit*  
<https://www.ready.gov/build-a-kit>

*FEMA Disaster Preparedness for Kids*  
<https://www.ready.gov/kids>

*FEMA Disaster Safety and Preparedness Information*  
<https://www.ready.gov/>

*FEMA Family Emergency Communication Plan*  
<https://www.fema.gov/media-library/assets/documents/108887>

*FEMA Protecting Family & Property*  
<https://www.ready.gov/make-a-plan>

*Food*  
[https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/basics-for-handling-food-safely/ct\\_index](https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/basics-for-handling-food-safely/ct_index)

*NOAA Flood Safety*  
[www.floodsafety.noaa.gov/](http://www.floodsafety.noaa.gov/)

*Safety*  
[www.arrl.org/safety](http://www.arrl.org/safety)

*Sleep Strategies for DX Contests from K5ZD*  
<http://k5zd.com/articles/a-sleep-strategy-for-dx-contesting/>

*Water*  
[www.ready.gov/managing-water](http://www.ready.gov/managing-water)

## **Review**

As important as a mission might seem, you must first take steps to protect your own home, family, and health. Plan well ahead and include other members of your family in your planning. Let others know where you will be and how to reach you. To avoid becoming part of the problem, bring along the items you will need to be comfortable, clean, and safe. Take time to



meet your own needs during your deployment so that you do not become part of the problem.

## Activities

1. Describe how you would provide for your own home, family, and health during an emergency.
2. Prepare a personal-needs checklist for yourself.
3. Describe two major disaster threats in your area. For each threat, list five actions you would take as a precaution to protect your home and family.

## Welcome to Topic 22 Knowledge Review

Please review the following questions to improve your understanding of this topic:

Question 1:

**Which of the following statements concerning water purification is *false*?**

- a) Boiling water for a full 5 minutes will kill most harmful bacteria.
- b) Boiling water to purify it can leave it with a flat taste.
- c) Filters may or may not remove harmful bacteria.
- d) Purification tablets will remove bacteria and particulate matter (dirt).

Question 2:

**Which of the following is *true* about using unscented household chlorine bleach to purify water?**

- a) It is best to use 8 tablespoons of chlorine bleach per gallon of water.
- b) Adding the proper amount of chlorine bleach to water will improve the taste.
- c) After adding bleach, water must sit for 3 hours before drinking.
- d) It is best to use 1/8 teaspoon of plain chlorine bleach per gallon of water.

Question 3:

**Which of the following is *true* about the personal gear you bring to a long-term incident?**

- a) Include several pairs of warm cotton socks.
- b) Lightweight summer clothing is all you will ever need.
- c) Keep spare eyeglasses or safety glasses/goggles in a hard-shell, felt-lined storage case.

d) As a volunteer communicator, you will need to bring specialized protective clothing.

Question 4:

**Many disaster assignments are in unsafe places. Which of the following is *true* about such locations?**

- a) Always plan an escape route from buildings and hazardous areas.
- b) Always plan more than one escape route from buildings and hazardous areas.
- c) The only dangers that you need be concerned with in any location are fire, flood, and falling debris.
- d) Dams, bridges, and buildings can generally be thought of as “safe zones.”

Question 5:

**Which of the following statements about safety and survival is *true*?**

- a) The mission takes priority over everything else.
- b) A person requires at least 4 gallons of water per day just for drinking.
- c) If caffeine keeps you awake, stop drinking caffeinated beverages at least 10 minutes before going to bed.
- d) Your personal safety and well-being are a higher priority than the mission.