Wisconsin Radiological Emergency Information

for

Farmers, Food Processors,
and
Distributors

Important Information
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Table of Contents

Page

Purpose of this Booklet…….……..…. 5

Emergency Planning …….....…… 5

How You Will be Notified……...…….. 7

Protective Actions You Should Take……...…… 9
- To Protect Farm Animals…….. 9
- To Protect Farm Lands and Crops……..... 12
- To Protect Honey…….…. 14
- To Protect Fish…….…. 14
- For Food Processors and Distributors……... 14
- For Water Utilities…….…. 15

Post Emergency Actions……..…….. 14
- Reentry……..…. 16
- Recovery……...…. 17
- Compensation for Losses……..…. 17

Contacts for Additional Information…… 18

What is Radiation?..... 19

Tables and Figures
- *Figure 1 - 50-Mile Emergency Planning Zone…..… 6*
- *Table 1 - Local Emergency Radio Stations……... 8*
- *Table 2 - Effects on Humans……..…. 20*
- *Figure 2 - Sources of Radiation…… 21*

Wisconsin Radiological Emergency Information

THE PURPOSE OF THIS BOOKLET

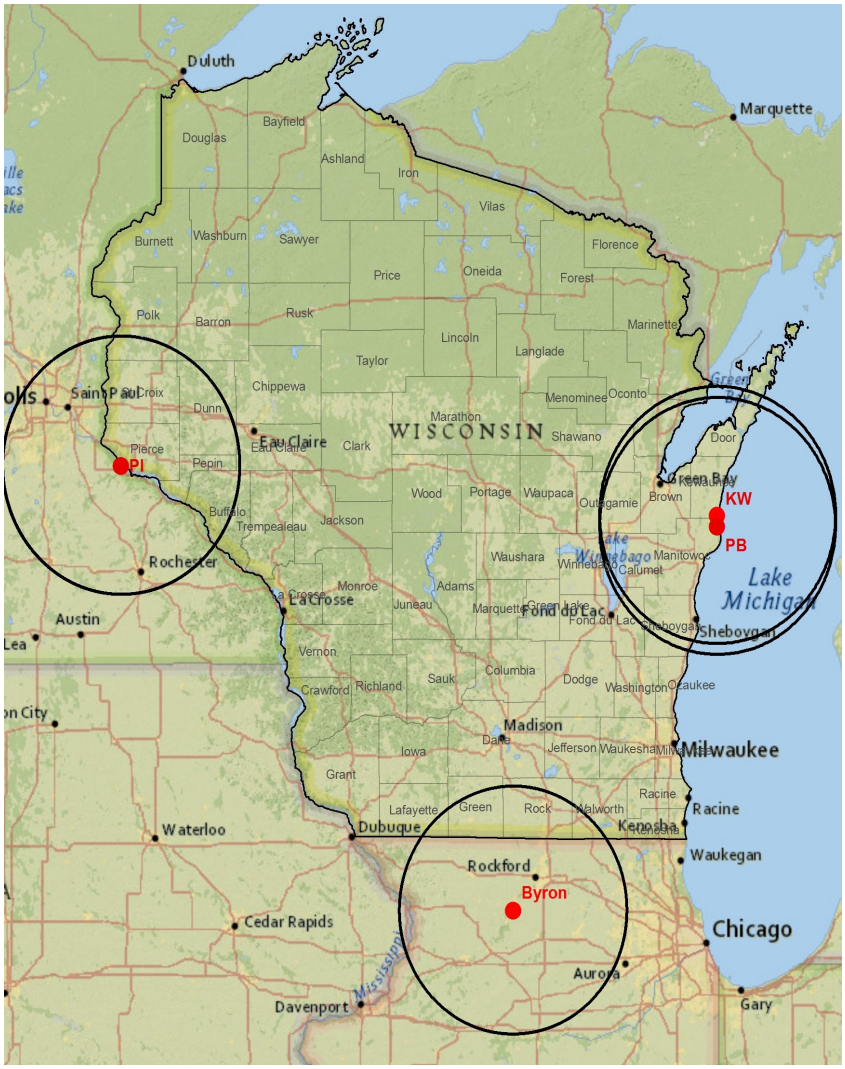
This booklet provides information for the agricultural community within a 50-mile radius of the **Prairie Island, Kewaunee and Point Beach Nuclear Power Stations.** It explains the actions which you may be advised to take in order to protect your livestock and crops in the event of a radiological emergency.

EMERGENCY PLANNING

In the event of an incident at a nuclear power plant with a large radioactive release, one of the major concerns is to prevent the public from eating or drinking food or water contaminated with radioactive material. The danger in eating food containing radioactive material results fro m the cumulative internal radiation exposure to your body as you continue to eat the contaminated food.

For planning purposes, an Ingestion Pathway Emergency Planning zone (IPEPZ) covering a radius of 50 miles has been established around each nuclear power plant in the nation. (Figure 1, page 6, shows the 50-mile radius around the nuclear plants affecting Wisconsin.) The radiation levels found in the 50-radial mile area after a nuclear power plant incident will not be high enough to require evacuation of the general public. It is only within the area of 10-radial miles around the power plant that evacuation (due to higher radiation levels) may be required. Extensive planning and exercising has been done in the 0- to 10-mile area. In the 10 - to 50-mile areas around a plant, the major threat to the public will come from ingesting food contaminated with radioactive material. Emergency plans have been prepared by state and county emergency management officials to advise you of the actions you should take if the need arises to protect the food supply and to prevent ingestion of contaminated food.

Figure 1. 50-Mile Ingestion Pathway Emergency Planning Zone



KW = Kewaunee Power Station
PB = Point Beach Nuclear Plant
PI = Prairie Island Nuclear Generating Plant

HOW YOU WILL BE NOTIFIED

There are several ways that you will be notified of an incident at a nuclear power plant and if it is necessary to take shelter or evacuate. These include:

If you live within 10 miles of the plant, warning sirens will be sounded and emergency instructions and information will be broadcast over the local Emergency Alert System if a protective action recommendation is made. If you live between 10 and 50 miles, emergency instructions and information will be broadcast over television and radio stations in your area.

State and local officials will issue news statements containing emergency instructions and information. Table 1 on page 7 contains a list of local radio stations.

There would likely be continuous television and radio coverage of the nuclear power plant incident. This coverage will include news conferences held by state, local, federal and utility officials. These news conferences will contain information about the emergency actions you should take.

You should play close attention to the information you hear over the Emergency Alert System, and the information you hear from State and local officials in the televised and broadcast news conferences. This information will contain official instructions which have been coordinated by Wisconsin Emergency Management and the Wisconsin Departments of Heath Services, Agriculture, Trade and Consumer Protection; Natural Resources and other appropriate local, State and federal agencies.

Table 1. Local Emergency Radio Stations

AM Radio Stations	Kewaunee/Manitowoc
WCUB 980	Manitowoc/Two Rivers
WDOR 910	Sturgeon Bay
WOMT 1240	Manitowoc/Two Rivers
WGBW 1590	Two Rivers
FM Radio Stations	**Kewaunee/Manitowoc**
WDOR 93.9	Sturgeon Bay
WLKN 98.1	Cleveland
WLTU 92.1	Manitowoc/Two Rivers
WQTC 102.3	Manitowoc/Two Rivers
WAUN 92.7	Sturgeon Bay
WRKU 102.1	Sturgeon Bay
WRLU 104.1	Sturgeon Bay
WSRG 97.7	Sturgeon Bay
AM Radio Stations	**Pierce County**
KCUE 1250	Red Wing
KDWA 1460	Hastings
FM Radio Stations	**Pierce County**
KWNG 105.9	Red Wing

PROTECTIVE ACTIONS THAT YOU SHOULD TAKE

Wisconsin Emergency Management, in conjunction with the Department of Health Services, Agriculture, Trade and Consumer Protection, Natural Resources and other state and federal agencies, will determine the protective actions that you should take. These protective actions could include instructions for the proper washing of food items before eating them, sheltering livestock and feeding them protected feed and water, the embargo of the sale and transportation of certain food and feed items, or other instructions which may be appropriate.

The State will use the information from samples collected by State and federal personnel to determine the location and amount of radioactive contamination that has escaped from the plant. You will be notified through official broadcasts and news statements about the area affected by radiological contamination and any protective actions you should take to protect yourself and the food supply.

ACTIONS TO PROTECT FARM ANIMALS

It is important to shelter animals, their feed, and their water supply. If livestock and dairy animals consume contaminated feed and water, some of the contamination will be absorbed in their bodies, and it could enter the human food supply through meat and dairy products.

State and local government officials will inform you about the actions you should take depending upon your distance from the nuclear power plant.

Removing farm animals from pasture and placing them in a protected place are the most effective ways to limit their contamination by radioactive material.

- If possible, put your animals in a totally enclosed barn, shed or other shelter, and limit entry of outside air and rainwater into the structure. Give them food from enclosed barns, sheds, granaries, and silos. Feed stored outside, which is directly exposed to air and rain, may be contaminated.
- Feed stored in sheds and cribs with open sides, uncovered haystacks or bales, bunker silos and feed piles that are not covered, and upright silos without roofs may also be contaminated. Give your animals water that has been protected from direct contact with air and rain.
- Some form of sheltering is better than none. The best protection is in a totally enclosed structure that has a roof and masonry, metal or stone walls. When animals are enclosed, remember:
    - Do not overcrowd.
    - Do not allow them to become overheated.
    - Allow some air ventilation.
    - Provide water and feed from protected sources.

Remove dairy animals from pasture and feed lots first, followed by other types of livestock. Radioactive materials can quickly enter the food chain through milk and other dairy products, so it is essential that priority be given to protecting dairy animals. If you live in an area within 10 miles of the plant that has been evacuated, you will be allowed to temporarily reenter the area to milk and feed dairy cows if radiation levels are low enough for safe reentry.

Poultry can remain in their existing structures because they are normally raised under some type of shelter and given stored feed and covered water.

If it is necessary for you to evacuate, and time permits, be sure to leave enough water and feed for your livestock (one day's supply or more).

If animals are exposed to radioactive particles or rainwater, they should be washed with uncontaminated water before being brought into a sheltered area. Washing animals requires protective clothing such as what you would wear when applying pesticides.

Do not destroy, market or slaughter any animals unless directed to do so by state authorities.

These animals should not be sent to market until they are determined to be safe for consumption, or until a decision is made to dispose of them. You will be instructed as to how to safely handle, decontaminate or dispose of any farm animals that have been contaminated. Aquaculture operators should contact your extension agent or the Department of Agriculture, Trade and Consumer Protection.

Do not allow animals to graze unless directed to by your extension agent or other state officials.

Follow these procedures until state officials inform you that the level of radiation has decreased to a safe amount.

If you have questions about caring for your animals during an emergency situation, contact your agriculture extension agent.

ACTIONS TO PROTECT FARM LANDS AND CROPS

Most farmland that is contaminated by a radiological incident can be used again for agricultural purposes. The length of time that the land should remain fallow depends on the amount and types of radioactive materials that settled on the land. If your land is or may be contaminated, emergency officials will:

- Determine the types and levels of the contamination. This may require authorized officials to take samples of air, water, oil, and crop and animal products, such as milk.
- Recommend treatment procedures such as idling the land for a specific period of time, liming the soil to prevent absorption of specific radioactive substances by the crops, and alternating crops or deep-plowing the soil to limit surface and plant exposure to contamination.
- Recommend alternative uses of land for a period of time.

Standing crops should be allowed to grow to maturity. The amount of radiation exposure that could occur would most likely not be strong enough to damage their growth and safety. Most contamination will either be washed off or will drop to safe levels during the growing process. Your agricultural extension agent or other official will advise you if special harvesting procedures will be needed or if other actions are required.

Contaminated grains that are permitted to grow to maturity will probably only require milling or polishing to remove the contamination. When grain or other feed is stored in an exposed location and not intended to be milled for feed, it can be made safe by carefully removing

the contaminated surface layer of grain. Store this contaminated grain or feed separately until your extension agent or other official instructs you on handling.

Unprotected fruits and vegetables in the field may have radioactive particles on the surface. Leaves, pods, and fruits should be washed or peeled before eating. Some leafy vegetables may be eaten after the outer layers are removed and the product is washed. Ripe fruits and vegetables may be lost if high levels of radioactive contamination prohibit entry of persons to harvest them. Those that do not need to be harvested immediately can be salvaged when the area has been determined safe for harvesting.

Roots and tubers such as potatoes and carrots can generally be eaten after they are washed and peeled.

Pasture and forage plants usually retain very little of the radioactive material deposited on them. The extent to which plants collect and retain radioactive materials depends on the amount and types of the radioactive substances, the nature of the soil and ground cover, the foliage characteristics, and the weather conditions.

ACTIONS TO PROTECT HONEY

Beehives will have to be monitored by authorities to determine if contamination is present. Actions you may be asked to take range from destroying the hive, removing and destroying the affected combs, or storing the honey until the contamination levels are reduced to an acceptable level. If no contamination exists or a safe level is detected, honey may continue to be harvested.

ACTIONS TO PROTECT FISH

State and local officials will need to monitor fish raised in ponds or fish hatcheries to determine if contamination is present. If no contamination, or a safe level is detected, fish may continue to be harvested.

PROTECTIVE ACTIONS FOR FOOD PROCESSORS AND DISTRIBUTORS

Food processors and distributors will also have to take actions to protect the food supply. They will have to comply with embargoes, which may be placed on the sale and transportation of food items that are found to be or believed to be contaminated with radioactive material. Additional protective measure will include preventing processing plants and facilities from becoming contaminated, the decontamination of those plants if the need arises, and prevent the contamination of food items which are shipped into or out of the area. Any protective

measures that are instituted will have to remain in effect until food samples can be collected and tested in a laboratory to determine if they are safe to eat. In the event of an incident at a nuclear power plant, state and federal officials will give you more detailed information about the action you should take.

WATER UTILITIES

Managers of water utilities will have to take actions to protect the water supply. Utilities which obtain their water supply from sources of surface water are of primary concern because surface water is the most easily contaminated by airborne radioactive material. Water obtained from wells is much less likely to be contaminated. State personnel will collect water samples at the supply source and at the treatment facility to determine if radioactive contamination is present. You will then be instructed as to the need to shut intakes into water purification facilities.

POST-EMERGENCY ACTIONS

Reentry

Reentry and recovery activities will take place after the immediate danger of the emergency has passed and the contaminated areas have been clearly identified. Initially, reentry into a restricted, contaminated area will be temporary and will be allowed only under controlled conditions. In all probability, this area will be within the 10-mile radius of the commercial nuclear power station.

If you have been evacuated from your area, you may be allowed to return temporarily to your farm when conditions permit. State or local government officials will advise you through the commercial media or other official means if a decision to permit reentry is made. You will receive specific instructions on routes to use and safety precautions to take. Reentry will allow you to perform such vital activities as milking, watering, and feeding farm animals.

Recovery

Recovery is the process of reducing radioactivity in the environment to acceptable levels for normal daily living. Following the emergency, state officials will identify the types and levels of contamination. They may take samples of air, water, soil, crops and animal products from your farm or business. They will provide you with the instructions and assist you in decontaminating your animals, food and property if such actions are necessary. Contaminated food will be isolated to prevent its introduction into the market place. State officials will determine whether condemnation and disposal are necessary.

Compensation for Losses

Compensation for the losses you suffer as a result of a nuclear power plant incident may be available. Make sure that you carefully document all losses that you incur. The utilities, which operate nuclear power plants in this country, contribute to an insurance fund administered by American Nuclear Insurers. These funds will be used to compensate members of the public for losses they may suffer.

CONTACTS

Additional information can be obtained from your County Emergency Management Office or the local Cooperative Extension Service Office, as well as from the following agencies:

State of Wisconsin
Wisconsin Emergency Management
(608) 242-3232

Department of Agriculture, Trade and Consumer Protection
Emergency Coordinator
(608) 224-5001

Manitowoc County - UW Extension
(920) 683-4168

Kewaunee County - UW Extension
(920) 388-7141

Pierce County - UW Extension
(715) 273-3531 ext. 6663

WHAT IS RADIATION?

Radiation is a form of energy. There are different types of radiation. The type known as "ionizing radiation" can cause physical or chemical changes if it enters or penetrates humans or animals. Ionizing radiation comes naturally from a number of sources in the environment, from radioactive elements used in certain medical treatments, or from the operation of a nuclear power plant. The ionizing radiation that comes from the operation of a nuclear power plant is under control and kept within the plant. If humans or animals are exposed to a very large amount of ionizing radiation, regardless of where it comes from, they may become sick or die.

Radiation is measured in units called millirems. The millirem measures the biological effect of exposure to radiation. The effect ionizing radiation will have on you will depend upon a variety of factors including:

- How far away you are from the source of radiation.
- The amount and part of your body that is exposed.
- The amount of radioactive material you breathe or take into your body.

The air around us, rocks, soil and the food we eat naturally expose us to very low levels of ionizing radiation. Recently, we have become aware of the problems resulting from the presence of radon gas found in houses and buildings. We are also exposed to small amounts of ionizing radiation from medical and dental x-rays. Taken together, these sources of natural and man-made radiation expose us to about 360 millirems of radiation each year. Figure 2 on page 21 shows the sources of radiation exposure to the general population in this country. Operating nuclear power plants are listed under the part of the diagram called Industrial and Occupational.

A nuclear power plant operating under normal conditions would add about 1 millirem per year to your radiation exposure if you lived across the street from the Plant.

The less time you are exposed to radiation, the less chance you have of experiencing any detectable effects. The following table gives you the expected biological effects on humans from the exposure of your whole body to radiation for a 24-hour period.

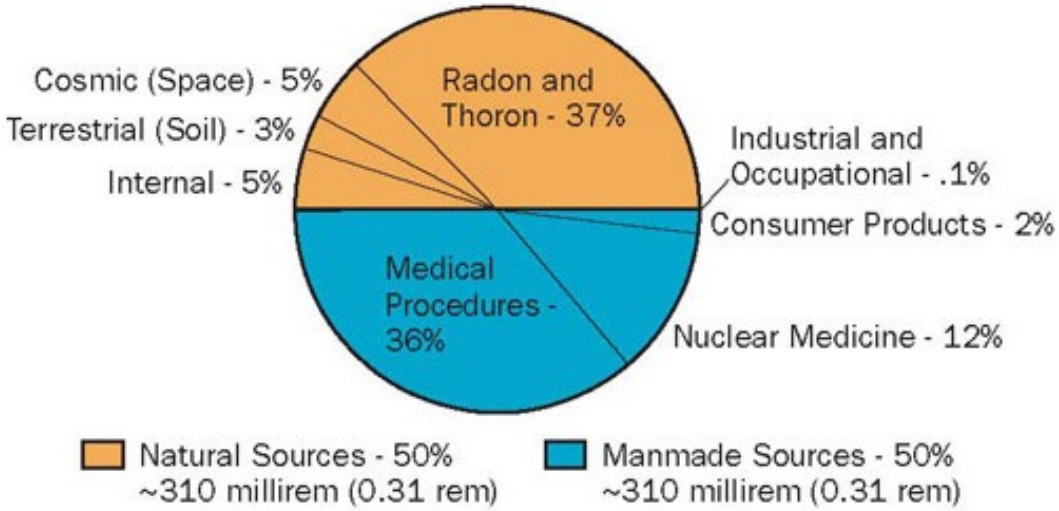
Table 2. Expected Biological Effect on Humans*

Millirems**	Effect
0 to 5,000	No detectable effect
5,000 to 50,000	Slight changes in your blood
50,000 to 100,000	Changes in your blood, nausea, fatigue
100,000 to 200,000	Changes in your blood, nausea, fatigue, vomiting. Up to 1% of the people exposed to this level of radiation may die if they do not receive medical treatment.
450,000 to 700,000	Up to 50% of the people exposed to this level of radiation may die within 1 month if they do not receive medical treatment.

* From the U.S. Nuclear Regulatory Commission's Nuclear Power and Radiation Workshop Manual.

** A Millirem is equal to 1/1000 of a REM (Roentgen Equivalent Man). Quantities measured in REM are designed to represent the biological effects of ionizing radiation on humans.

Sources of Radiation Exposure in the United States



Source: NCRP Report No. 160(2009)
Full report is available on the NCRP Web site at www. NCRPpublications.org.

NOTES

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