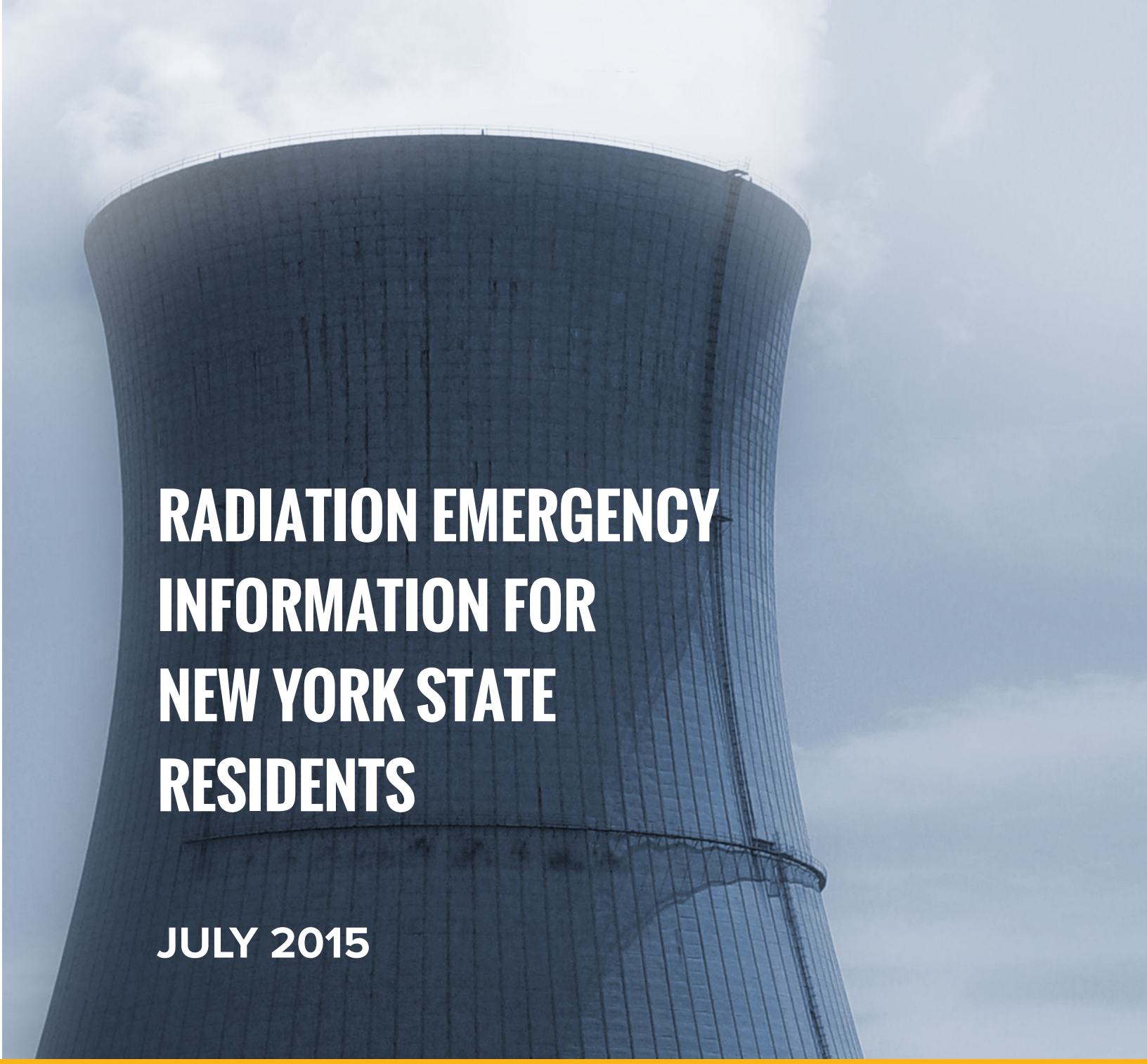

RADIATION EMERGENCY INFORMATION FOR NEW YORK STATE RESIDENTS

JULY 2015

NEW YORK STATE

Disaster Preparedness Commission

This booklet is for all New York State residents, but is most relevant for those who live within 50 miles of a nuclear power plant.

This booklet describes:

- *Steps taken to prevent contamination during and after an incident at a nuclear power plant.*
- *How the safety of food and water supplies will be ensured in the event of a disaster.*
- *What you can do to protect yourself and your family.*

For non-emergencies, anyone with questions may contact:

New York State Division of Homeland Security and Emergency Services
Office of Emergency Management
1220 Washington Avenue
Bldg. 22, Ste. 101
Albany, NY 12226
Phone: (518) 292-2311
Website: *www.dhses.ny.gov*

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RADIATION AND ITS EFFECTS

What could be released from a nuclear power plant?

In an emergency at a nuclear power plant, radioactive materials released from the plant would be in the form of radioactive gases and radioactive dusts. These gases and dusts would travel away from the nuclear plant in a cloud, or a "plume." Weather conditions and geography would determine the path of the plume.

Once released from the nuclear plant, the cloud of radioactive dusts and gases would be concentrated. As the cloud moved along with the wind, it would spread out and become more dilute.

Radioactive dusts settle out (much the way soot settles out of smoke) onto the ground and other surfaces and most of the radioactive gases blow away. As you move farther away from the plant, less and less radioactive material remains in the plume.

One type of gas released from a nuclear plant would be radioiodine. Even though it would be released as a gas, the radioiodine would settle onto surfaces like a dust. If inhaled or ingested, radioiodine would deposit in the thyroid gland where it could cause damage and increase risk of developing thyroid cancer.

Why are radioactive materials harmful?

Radioactive materials are harmful to living beings, including people, animals and plants, because they give off energy that can damage living cells.

The amount of damage that the energy from radioactive materials can cause depends on:

- Its strength;
- How much of it is present;
- How far away it is from the body; and
- How long the radioactive materials (contamination) are in, on or near the body.

As a rule of thumb:

The closer you are to the nuclear power plant, the higher your risk of exposure to radioactive contamination from an accident at the plant.

How can I be exposed to radiation from a power plant release?

There are two ways you can be affected by radiation: exposure and contamination. Both can occur if radioactive materials are released during a nuclear power plant emergency.

Contamination: Radioactive contamination is the presence of radioactive materials where they are not wanted. Contamination occurs when radioactive materials (e.g., dusts) are deposited on or in an object or person. External contamination occurs when radioactive material or dust comes into contact with a person's skin, hair or clothing. People can also become internally contaminated if radioactive materials get into their bodies, for example, by swallowing or breathing in radioactive materials. Some types of radioactive materials stay in the body and are deposited in different body organs; other types are eliminated from the body in blood, sweat, urine, and feces.

Exposure: Radioactive materials give off radiation, a form of energy that travels in waves or particles. This energy can penetrate the body. When you are close enough to the radioactive materials for your body to absorb some of the energy, you have exposure. This exposure stops when the radioactive material is no longer present. Exposure can be external (from radioactive material deposited on the ground) or internal (from radioactive materials inhaled or eaten).

How can I limit or minimize my exposure to radiation from a power plant release?

Both external and internal contamination can cause exposure to radioactive materials. If you live within 10 miles of the nuclear power plant, you may be asked to evacuate or shelter-in-place in an emergency. Removing contaminated clothing and washing off the radioactive materials will minimize exposure from external contamination. Avoid eating contaminated foods to prevent internal contamination.

If you think you have been externally contaminated, you should:

- Remove the outer layer of your clothing and place the clothing in a plastic bag.
- Wash all of the exposed parts of your body as you would normally, with soap and warm water. Do not use hair conditioner.
- Do not eat, drink, or smoke until you have washed your hands and face.

Internal contamination needs to be assessed by a medical professional.

Are there any health risks expected from exposure to released radioactive materials?

Radiation can cause two types of health effects: immediate and long-term.

Immediate effects are not likely to occur as a result of a release at a power plant. To have an immediate health effect from radiation, you need to receive a very large radiation dose. Residents living near the plant may be evacuated or told to shelter in place in order to prevent anyone from getting a large enough radiation dose to cause immediate health effects.

Long-term effects include increased risk of developing cancer. Any exposure to radiation can cause this increase – the higher the exposure, the higher the risk of developing cancer later in life. Protective actions, including evacuation, taking potassium iodide (KI), and avoiding fresh produce and milk from the affected area, should minimize exposure to radiation and, therefore, minimize the risk of anyone developing cancer.

What would be done to minimize exposure to the public?

To minimize radiation exposure to the public, residents close to the plant would be evacuated or told to shelter in place and would be instructed to take potassium iodide (KI) tablets. KI fills the thyroid gland with stable iodine so that radioactive iodine does not stay in the body. One dose (two-65 mg tablets for adults) of KI protects the thyroid gland for 24 hours.

Residents instructed to evacuate would be asked to report to county-based reception centers where monitoring stations would be set up to check and immediately care for anyone who might have been contaminated. KI would be provided at the reception centers to residents who had not already taken it.

People who live further from the plant (within 50 miles downwind) would be instructed not to eat locally grown produce or drink locally produced milk until it had been checked for contamination.

Would I need to take potassium iodide (KI)?

Radioiodine released from the plant would likely be in the atmosphere for a short time, then deposited to the ground and other surfaces. Only those people directed to evacuate would be told to take KI as they would likely be exposed to radioiodine that is in the air. Persons in other areas would have little risk of breathing in the radioiodine and would not need to take KI. Avoiding foods grown in the contaminated area would prevent exposure to radioactive iodine deposited on the ground.

How can food or water become contaminated?

Food or water becomes contaminated when it comes in contact with radioactive dust. For plants and animals, the contamination can be on the surface, taken up by the plant or animal, or both. People may be affected by eating contaminated food.

If a plant or animal is contaminated, will it die?

Not likely. Most plants and animals are less sensitive to radiation than humans. They can tolerate a higher amount of radiation and not become ill or show any effects. However, they may be dangerous to eat. This is why the precautions and testing described in the rest of this brochure are important and necessary.

WHAT IS BEING DONE TO PROTECT THE PUBLIC?

How would I receive information about the incident?

New York State ensures that all information regarding a nuclear power plant accident, including the presence of contamination and food safety issues, are publicized in a number of different ways. In the event of an emergency, news media outlets are the primary source of information to the public.

When watching television, listening to the radio, or reading the newspapers during a disaster, make sure you are taking advice from official sources, who should be quoted and giving out information that is easy to understand. If you are ever uncertain about the information given, or if you hear conflicting advice, contact your local emergency management office. In an emergency, a public hotline would be made available to those with questions or concerns.

How would I know what areas are contaminated?

During and after the release of radiation from a nuclear power plant, the New York State Department of Health (DOH) and affected counties would deploy field monitoring teams to measure the amount and types of radioactive materials that have been released. Information gathered from the field monitoring teams and other sources would be used to define the contaminated area, or "footprint." Once defined, the location and extent of contamination would be relayed to the public through media outlets. It's important to note that only areas of significant contamination will be evacuated. Lesser contaminated areas will remain occupied.

What precautions would be taken to prevent contamination of the food supply?

When power plant operators and New York State believe that a radioactive release could occur, farmers downwind of the power plant would be instructed by the NYS Department of Agriculture and Markets to bring dairy animals inside. Farmers would also be advised not to allow animals to graze, eat uncovered feed, or drink water from uncovered sources. This is especially important for dairy animals because radioactive iodine, one of the contaminants which might be released from the nuclear plant, can concentrate in milk.

In addition, an agricultural quarantine may be established in the areas of potential contamination, restricting the movement of any food products and livestock in those areas and keeping them from entering into the market place.

Finally, once the release begins, traffic would be diverted to prevent the transportation of food products through areas where it may become contaminated.

If radiation was released from the plant before the message to bring animals inside was broadcast, or if the farmers did not have time to take all the precautions advised, the animals could become contaminated. Food products from these animals would be tested before they were marketed.

Would all food supplies be tested immediately?

As soon as the state identified areas with radioactive contamination, a plan for testing the food would be developed. The first product tested would be milk, as radioiodine concentrates in milk. Children are the primary consumers of milk, and radioactive iodine may damage a child's thyroid gland. This makes it very important to prevent or reduce exposure of the cows, goats and sheep to radioactive iodine, and to keep contaminated milk from the market. This is why farmers are advised to shelter dairy animals as early as possible during the incident. Testing of milk from farms in contaminated areas would continue until the milk is safe.

All other food supplies would be tested as close to market time as possible because radioactive materials on plants or animals might decrease or be washed away by rain. An early test might show a higher level of contamination than if the product was tested just prior to harvest or market. Alternatively, a plant or animal could absorb radioactive contamination from the soil or from its food over time. In this case, a radiological measurement taken earlier could show lower levels of contamination than one taken at harvest time.

Who decides what food is safe? How is this decision made?

The Governor of the State of New York would make decisions on the safety of the food supply of New York State residents. The Governor would be advised by several state agencies, including the Department of Agriculture and Markets, Department of Health (DOH), the Department of Environmental Conservation (DEC), and the Office of Emergency Management (OEM). These agencies make recommendations based upon results obtained from laboratory testing. Test results would be compared to the guidance given by the federal government, including the U.S. Department of Agriculture (USDA), the U.S. Food and Drug Administration (FDA), and the U.S. Environmental Protection Agency (EPA). Foods with contamination higher than the guidelines would not be allowed to go to market.

Would the water supply be at risk for contamination?

Open water supplies: Any radioactive material that could be in an uncovered water supply, such as an open reservoir, would be greatly diluted by the quantity of water in the reservoir, so it is unlikely that the water would be significantly contaminated. In addition, standard water treatment will remove some of the contamination, making it even less likely that the water in your home would not be safe to drink.

Water samples would be collected from numerous public water supplies within the affected area, and the state would ask for federal assistance in getting test results back quickly. As an extra precaution, uncovered water storage reservoirs could be taken off-line pending sample results.

Well water: Because soil is a very good filter for contaminates, well water is unlikely to be affected. As a precaution, wells that provide water for public water supplies would be tested. Individuals may request testing of their private wells through an approved laboratory (http://www.wadsworth.org/labcert/elap/radiochem.html).

Information on the safety of the water supply and recommendations for limiting exposure to potentially contaminated water would be provided through media outlets.

What would happen to contaminated food, water, or milk?

Depending on the type and amount of radiation, food could be considered safe and be released to market, it could be stored for a period of time until the radiation has decreased, or it could be condemned and destroyed.

Food with **high levels of contamination** would be condemned and destroyed in a safe manner.

Food that was **not contaminated** or that had **very low levels of contamination** (not expected to cause adverse health effects) could be released to the market. This means they would be processed and sold in the normal manner.

Food products with **intermediate levels of contamination** (which may vary according to the kind of food and the type of contamination present) could be held in storage until the radiation levels decreased to a natural level.

Food could be held for the radiation to decrease if all of the following conditions are met:

- The radioactivity will decrease in a short period of time (before the food is spoiled or past its shelf life);
- There are facilities which can process or hold the contaminated product; and
- The Governor approves.

If any of these conditions were not met, the product will be destroyed.

Is there a possibility that contaminated food would be mixed with uncontaminated food so it can be sold?

No. The U.S. Food and Drug Administration prohibits the mixing of contaminated foods with uncontaminated foods, no matter what the source of contamination.

How safe would it be to hunt or fish?

The NYS Department of Environmental Conservation (DEC) would evaluate the potential for wildlife and forage to be contaminated and make appropriate recommendations. This could include restrictions on the taking of fish and game, or requiring monitoring for radiation before butchering.

Migratory wildlife, including game birds, could present a problem outside of the affected area if the animal became contaminated and then moved to an unaffected area. Anyone who suspected that hunted wildlife migrated from a contaminated area would be instructed to contact the DEC or call the public inquiry hotline.

WHAT CAN INDIVIDUALS DO?

Can contaminated food be made safe?

If contamination were only on the outside of the produce, it is possible that it could be removed by thoroughly washing the surface, or by removing the outer, contaminated layer (such as peeling vegetables or fruit).

Food contaminated on the inside may be stored to allow time for the radiation to decrease. Once radiation levels decrease to a safe level, the food could be consumed. The level of contamination remaining in the food must be determined by a laboratory. Additional information would be made available through the media or public inquiry line.

Would I have to destroy food from my garden?

In a radiological emergency, you would be advised by officials whether or not garden produce in your area was safe to eat. Anyone uncertain about the safety of their garden produce would be instructed to avoid eating it until gardens and farms in the area were tested. If produce and herbs were contaminated, you would be given information about how to clean, store, or dispose of the garden food.

Depending on the type and amount of radioactive materials deposited, you could also be advised on future planting. For example, you may be told to deep plow or plant a non-food product for a season. As a last resort, your soil could be removed and replaced.

Would the food in my house be safe to eat?

If you live in an area where there was no contamination found, the food in your house would not have any contamination, either. If you live in an area where there was some contamination, food that was packaged in airtight containers such as cans or sealed plastic bags, and food in the refrigerator or freezer, would be uncontaminated.

If radiological contamination was found in your home, you would be given advice or assistance about how to remove the contamination. Washing the surface of the package or the exterior of the refrigerator with soapy water usually removes contamination.

If an area has radioactive contamination that can affect the food supply, why is it considered safe for children and pets to live here?

Radioactive material inside the body is much more dangerous than radioactive material outside the body. Therefore, an area may be safe to live in even though it is not safe to eat food from that location.

Is there anything I could do to further decrease contamination in my home?

Remember that contamination is radioactive dust and, in most cases, can be removed by washing with soap and water. To reduce potential exposure, you could take the following steps inside your home:

- Throw away food open to the environment, such as a bowl of fruit on a countertop. There is no need to throw away food that was kept in a closed refrigerator or was in a closed container. Still, if you are concerned about it, throw it away.
- Use wet methods to wipe things whenever possible. Use a damp rag or mop to clean surfaces. Dispose of cleaning materials in the regular trash.
- Do not use a vacuum cleaner until after you have done a wet wash.
- Do not eat, drink, or smoke while you are cleaning up.
- Wear disposable gloves and use good hygiene. Wash hands after cleaning up.
- Start your cleanup work in the dirtiest part of the work area (for example, near an open window) and work toward the clean area further inside. Work from the top of the room toward the bottom.
- Dispose of used wash water down the toilet. Do not pour it on soil.
- Shower and wash your hair right after finishing.
- Be careful of your shoes tracking radioactive materials. Wipe your feet before entering a clean area.
- Limit pets' time outside. Wash with warm, soapy water to remove contamination. Wipe pets' feet when they enter the house.

Should pregnant women take special precautions?

Actions recommended to the public would also protect fetuses. In some instances, homes in which pregnant women reside would receive higher priority in radiological monitoring. Pregnant women should inform their health care providers of the results of any radiological monitoring, and refer all of their health questions and concerns to their health care provider.

What about lawn furniture, swing sets, and/or swimming pools?

Depending on the area in which you live, the amount and type of radioactive contamination to your area, and materials (wood, metal, plastic) that could be contaminated, you could be advised to:

- Use your yard as you usually do.
- Leave everything alone for a short period of time (a few weeks to a month or two) to allow the weather to remove contamination.
- Scrub down surfaces with water and soap or other special product, or dispose of your belongings.
- Empty pools or sandboxes.

Disaster Preparedness Commission

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