United States
Environmental Protection
Agency

Radiation Protection

EPA's Unique Role

Radiation exists everywhere in the environment and has since the Earth's formation—in rocks, soil, water, and plants. The mining and processing of radioactive materials for use in medicine, power generation, consumer products, and industry inevitably generate emissions and waste. Recognizing the potential hazards of these activities, Congress designated EPA as the primary federal agency charged with protecting people and the environment from harmful and avoidable exposure to radiation.

Key Responsibilities

EPA carries out its radiation protection responsibilities with several key, complementary activities.

Responding to Emergencies

EPA is the lead federal agency for responding to international emergencies involving radioactive material, such as the accident at Chernobyl. EPA also provides support, guidance, and training to other federal and state agencies to prepare for emergencies at U.S. nuclear plants, transportation accidents involving shipments of radioactive materials, and acts of nuclear terrorism. Through emergency drills and exercises, EPA's radiological emergency response team helps states and other agencies test their response plans and hone their skills.

Assessing Risks

EPA's scientists study both the risk of exposure—the way that radioactive materials move through the environment and the potential for human contact—and the risks from exposure—how radiation affects human health. Key risk assessment activities include monitoring the environment for above-normal levels of radiation, studying the effects on human cells from exposure to different kinds and amounts of radiation, and developing mathematical models to estimate the effects of potential exposures.

Responding to Terrorism

EPA's Counterterrorism Program Coordinating Team is actively involved with other U.S. government agencies for preparing to respond to acts of chemical, biological, radiological, and nuclear terrorism. For terrorist incidents involving radioactive materials, EPA provides support to the Federal Bureau of Investigation and the Federal Emergency Management Agency by: (1) establishing guidelines for protecting the public from radiation exposure, such as when to evacuate or relocate citizens; (2) monitoring and assessing the radioactivity in the environment from an incident; and (3) defining the extent of exposure to the public.

Controlling Lost Radioactive Sources

Some devices used for industrial and medical purposes contain radioactive material sealed in a metal casing. If these devices are lost, stolen, or abandoned, they are called "orphan sources." Every year in the U.S. there are over 200 reports of "orphan" radioactive sources. Each of these uncontrolled sources poses potentially serious risks to public health and the environment.

Radioactive sources are often placed in scrap metal destined for recycling. If the protective casing around the source breaks open or is "breached" at a metal processing facility and the radioactive material is released, people and the environment may be contaminated. To date, there have been over 70 meltings of radioactive sources at steel mills, which have contaminated the facilities and may have exposed workers to radiation. The average cost to clean up a contaminated facility is $10-$12 million.

EPA's Orphan Sources Initiative is helping states recognize, retrieve, and safely store and dispose of these radioactive sources before they endanger workers and the public.

Safeguarding Radioactive Waste Disposal

In 1980 Congress authorized DOE to develop the Waste Isolation Pilot Plant (WIPP) as the nation's first deep underground facility for the permanent disposal of radioactive waste from U.S. defense programs. The WIPP is located 2,100 feet underground in the natural salt formations outside Carlsbad, New Mexico. To protect local residents and ground-water resources from dangerous levels of radioactive contamination, Congress also charged EPA with finalizing regulations that limit radioactive emissions from all disposal facilities, developing criteria to implement and interpret those generic regulations specifically for the WIPP, and certifying the WIPP's compliance with those criteria.

After a review of over 100,000 pages of documentation, audits and inspections, independent testing, public hearings and meetings, and over 1,000 public comments, in 1998 EPA certified that the WIPP is safe to contain the designated waste for at least 10,000 years. EPA continues to use its inspection authority to confirm that the WIPP is meeting safety requirements, and will shut down the plant if it finds significant noncompliance.

Setting Protective Limits

EPA uses its risk assessment results to set protective limits on radioactive emissions for all media—air, water, and soil—and to develop guidance for cleaning up radioactively contaminated Superfund sites. In turn, other federal and state agencies use EPA's standards to develop their own regulations. For example, the Nuclear Regulatory Commission uses EPA's standards to develop regulations for commercial nuclear facilities, and the Department of Energy (DOE) uses them to develop regulations for facilities that once developed and produced nuclear weapons.

Protecting U.S. Borders

EPA is working with the U.S. Customs Service to develop improved systems for safeguarding the nation's borders against illicit or inadvertant movement of radioactive material into the U.S. Products manufactured with contaminated metals pose potential health risks to the workers who produce them and the consumers who buy them.

Looking to the Future

EPA is working with its partners to identify future risks of radiation contamination and exposure and to meet the public health and environmental protection challenges these risks present. Following are some examples of future challenges in four important areas.

National Security

- Disposition of dismantled nuclear weapons and materials
- Nuclear terrorism and nuclear bombs
- Nuclear proliferation, testing, and use in developing countries
- Large-scale planning for response to radiological accidents

Industry and Consumer Products

- Identification and tracking of new industries using radioactive materials
- Exposure to non-ionizing radiation (wireless communications, high-voltage power transmission lines, electromagnetic fields, lasers)
- Import of radioactively contaminated scrap metals and consumer products
- Recovery, tracking, and management of uncontrolled radioactive sources
- Naturally-occurring radioactive materials in building construction

Health and Medical

- Changes in technologies that increase medical exposures from frequent medical procedures
- Training and professional certification of health professionals to reduce excessive procedures and radiation overdoses
- Identification of new methods for informing the public and reducing radon-related lung cancer

Energy

- Decommissioning and dismantling of old nuclear power plants
- Wastes and emissions from alternative energy sources, such as wind power, hydropower, geothermal energy, and solar power
- Naturally radioactive contamination from traditional coal, oil, gas, and energy production

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