

# Fact Sheet

United States Nuclear Regulatory Commission

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## Environmental Monitoring

### Background

The discharge of radioactive effluents from routine nuclear power plant operations can have environmental impacts--on man, animals, plants, and sea life. During the licensing of a nuclear plant, NRC issues a Final Environmental Statement (FES) which identifies these potential impacts. As part of NRC's requirements for operating a nuclear power plant, licensees must:

- keep releases of radioactive material to unrestricted areas during normal operation as low as reasonably achievable (as described in the Commission's regulations in 10 CFR Part 50.36a), and
- comply with radiation dose limits for the public (10 CFR Part 20).

In addition, NRC regulations require licensees to have various effluent and environmental monitoring programs to ensure that the impacts from plant operations are minimized. The permitted effluent releases result in very small doses to members of the public living around nuclear power plants.

### Regulations

Current regulations to limit offsite releases and their associated radiation doses are much more restrictive than those required for nuclear power plants licensed in the 1960s. In 1975, the NRC amended its regulations (in 10 CFR Parts 50.34 and 50.36 and a new Appendix I) to provide numerical guides for design objectives and limiting conditions for operation to meet the radiation dose criterion "as low as is reasonably achievable." Adoption of these regulations requires that plant releases be kept to doses well below the radiation exposure limits for the public in 10 CFR Part 20.

In late 1979, the Environmental Protection Agency (EPA) placed an additional radiation dose requirement on reactor licensees. This requirement established total body, thyroid, and other organ dose limits for radioactive effluents and direct radiation. The NRC incorporated EPA's regulation into 10 CFR Part 20 in 1981, and all plants must now meet these requirements.

## **Monitoring Environmental Impacts**

The NRC requires licensees to report plant discharges and results of environmental monitoring around their plants to ensure that potential impacts are detected and reviewed. Licensees must also participate in an interlaboratory comparison program which provides an independent check of the accuracy and precision of environmental measurements.

In annual reports, licensees identify the amount of liquid and airborne radioactive effluents discharged from plants and the associated doses. Licensees also must report environmental radioactivity levels around their plants annually. These reports, available to the public, cover sampling from TLDs (thermoluminescent dosimeters); airborne radioiodine and particulate samplers; samples of surface, groundwater, and drinking water and downstream shoreline sediment from existing or potential recreational facilities; and samples of ingestion sources such as milk, fish, invertebrates, and broad leaf vegetation.

The NRC conducts periodic onsite inspections of each licensee's effluent and environmental monitoring programs to ensure compliance with NRC requirements. The NRC documents licensee effluent releases and the results of their environmental monitoring and assessment effort in inspection reports that are available to the public.

Over the past 25 years, radioactive effluents released from nuclear power plants have decreased significantly. During the early part of that period, a significant contributor to the reduction was the addition of special systems (augmented offgas systems) to boiling water reactors, which process some of the noncondensable gases formed in the reactor process to limit the radioactive gases released to the environment. In recent years, improved fuel performance and licensees' improved effluent control programs further contributed to reducing radioactive effluents.

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