



NUCLEAR ENERGY INSTITUTE

**Fact Sheet**  
**Perspective on Radiation Releases and Emergency Planning**  
**at U.S. Nuclear Power Plants**

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The nuclear energy industry fully supports federal government actions to protect the health and safety of Americans in Japan in the aftermath of the Fukushima accident. Given the lack of information on radiation levels at the plant, the analysis necessarily used conservative scenarios and models—including worst-case analysis—regarding radiation that could be released at the six-reactor site.

The government approach took into account the uncertainties associated with the limited information on radiation exposure rates at and near the Fukushima plant. While prudent for Americans in Japan for this situation, this action should not be interpreted as a standard that should be applied to U.S. reactor emergency planning policy, specifically the use of a 50-mile zone.

At U.S. nuclear power plants, detailed information regarding plant status and radiation exposure rates would be known to the Nuclear Regulatory Commission, state leaders and plant operators as an event progressed. This has been demonstrated in actual events and hundreds of emergency preparedness exercises at nuclear power plants.

Radiation levels near the Fukushima plant appear to have fluctuated considerably in recent days. The industry continues to seek accurate assessments of the radiation, but currently there is no health threat to the United States.

As context, radiation levels in the aftermath of the Chernobyl accident were 1 millirem per year in the United States and in Canada. By comparison, each person receives the same radiation dose from watching television over a year's time. Among countries neighboring the site of the Chernobyl accident, Bulgaria received the highest radiation dose from the Chernobyl accident at 76 millirem per year from Chernobyl, followed by Austria, 68 millirem per year, Greece, 59 millirem per year; Finland, 45 millirem per year.) The Nuclear Regulatory Commission's annual public radiation limit is 100 millirem.

While both the 10-mile emergency preparedness zone and 50-mile zone for monitoring the environment and food products were established for planning and preparedness purposes, in an actual emergency, response directors would designate protective actions beyond these zones should conditions require.

Decisions on whether to shelter or evacuate are made by state public safety officials, in consultation with local officials. This decision is based on information on the event provided by the affected nuclear power plant.

Some countries that are evacuating citizens from Japan are doing so due to lack of essential services rather than concern about radiation releases. Australia's Foreign Minister, Kevin Rudd, said: "There are problems in terms of electricity, power supply, as well as a whole range of other things as well."

### **Background on Emergency Planning at U.S. Nuclear Energy Facilities**

In 1978, the U.S. Nuclear Regulatory Commission (NRC), the U.S. Environmental Protection Agency (EPA), and the Federal Emergency Management Agency (FEMA) formed a task force to study and develop guidelines in establishing designated emergency planning zones (EPZs) around U.S. nuclear plants as the planning basis for emergency preparedness.

For the United States, the task force determined an EPZ of a **10-mile radius** around a nuclear power facility, based on the best available science at the time. Principal immediate protective actions for the public within this zone typically include instructions for sheltering and/or evacuation. Supplemental protective actions within this zone might include the distribution of potassium iodide tablets to protect the thyroid from radioactive iodine.

The task force concluded that most hypothetical reactor accidents would not be a threat to public health and safety beyond the 10-mile zone. The slow pace at which an event unfolds – over several hours or days – provides time for orderly evacuation or sheltering, if necessary.

The task force established a **50-mile zone** to limit public exposure to radioactive materials through consumption of contaminated water, milk or foods. No evacuation or sheltering would be needed in this area, however.

While both the 10-mile and 50-mile zones were established for planning and preparedness purposes, in an actual emergency, response directors have the discretion to designate protective actions beyond these zones should conditions call for them.

Nuclear power plants have instrumentation that continuously monitor in-plant radiological conditions. The instrumentation enables plant staff to remain cognizant of radiological conditions throughout the power plant and at the site boundary and take actions if conditions change.

Additionally, there are environmental monitors placed at designated locations beyond the site boundary that could record elevated radiation levels beyond naturally occurring radiation.

Planning for possible emergencies is an ongoing process and is done through partnership that includes the company that operates a nuclear plant, working alongside state and local officials.

Industry guidance and federal regulations require operators to have in place a range of actions to protect the public health and safety during the early phases of an emergency. These protective actions are recommended to local officials, who, under the authority of the state governor, decide which to implement.

Plant operators have the capability to make rapid calculations of radiation releases and projected “doses” to people. Depending on meteorological conditions and the severity of the accident, these projections are part of initial protective action recommendations provided to offsite public safety emergency management officials within 15 minutes of an event. More refined projections are typically provided within an hour of an emergency.

The U.S. nuclear energy industry takes continual steps to improve its emergency preparedness capabilities through:

- Constant upgrading of emergency response plans through lessons learned, regularly scheduled drills, exercises and critiques, and actual plan activations.
- An industrywide review following the events of Sept. 11, 2001, of management oversight of plant programs and communications approaches, applying lessons learned to strengthen emergency preparedness.
- Severe accident management guidance that deals with beyond design-basis scenarios addressing severe seismic or fire-related accident sequences resulting in complete loss of off-site and on-site emergency power and complete loss of cooling. This guidance was also revised for plant operator responses to the consequences of large aircraft impact.
- Training programs conducted annually for all emergency response personnel. The National Nuclear Accrediting Board accredits training programs for operators and technical staff who use emergency operating procedures.
- Upgraded facilities to aid in effective handling of emergencies, including offsite response centers that provide real-time plant data.

- Advancements in communications technology to notify appropriate plant employees, emergency response personnel and the public if an event were to occur.