RADIOLOGICAL EMERGENCY PREPAREDNESS (REP)

OVERVIEW OF THE REP PROGRAM

Following the 1979 Three Mile nuclear power plant incident, the responsibility for off-site radiological emergency preparedness activities were transferred to the Federal Emergency Management Agency (FEMA). FEMA established the Radiological Emergency Preparedness (REP) program to manage its responsibility in coordinating the radiological emergency response of local, state and tribal governments in areas surrounding commercial nuclear power plants.

The REP program provides reasonable assurance that public health and safety are not endangered by operation of nuclear power plant facilities by:

- Ensuring the health and safety of citizens living around commercial nuclear power plants will be adequately protected in the event of a nuclear power plant emergency.
- **EMERGENCY PLANNING ZONES (EPZs)**

EPZs are the designated areas surrounding nuclear power plants for which emergency planning is needed to ensure off-site response organizations can effectively respond in protecting the health and safety of the public.

There are two types of EPZs for planning purposes:

INGESTION EXPOSURE PATHWAY

- Ingestion of contaminated water or foods, such as milk, fresh vegetables and aquatic foodstuffs may result in increased risk of radiation induced cancer to the thyroid, bone arrow and other organs.
- Approximately **50 mile radius** of the plant.

There are **11** northern Indiana counties in that are within a 50 mile radius of a nuclear power plant:

Marshall

Newton

Porter

- Elkhart Jasper
- Kosciusko
- LaGrange
 - e St. Joseph Starke
- LakeLaPorte



Informing and educating the public about radiological emergency preparedness.



PLUME EXPOSURE PATHWAY

• Whole-body external exposure to gamma radiation from the passing plume

PLUME

- Thyroid exposure through inhalation.
- Approximately **10 mile radius** of the plume.



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EMERGENCY CLASSIFICATION SYSTEM

The Emergency Classification System is a standard emergency alert system distributed by nuclear power plant operators to notify the public that something unusual is happening at the power plant. The system is designed for a rapid and coordinated local, state and federal response. The agency that responds to the emergency alert system will depend on the type of emergency situation that is occurring. There are four different emergency classification "levels."



A **Notification of Unusual Event (NOUE)** can be triggered by any problem within the plant that potentially could lead to a decrease in safety. In this emergency level, no releases of radioactive material requiring offsite response or monitoring are expected, and the situation does not pose any threat to public safety.

An **Alert** emergency level is triggered by any type of event that causes a reduction in plant safety. A radiation release from the power plant is possible, but only in small amounts that are within the U.S. Environmental Protection Agency (EPA) protection action guideline exposure levels.

Site Area Emergencies (SAE) are triggered when events that cause a serious safety condition occur at the plant. In this emergency level, a radiation release is possible, but it is not expected to exceed the U.S. EPA protective action guideline exposure levels or leave the boundaries of the plant itself.

A **General Emergency** (GE) is the highest emergency level, and is triggered when the reactor core becomes or is expected to become damaged. During General Emergencies, radiation release is expected to be above the U.S. EPA protective guidelines, and exposure levels are expected to go beyond plant boundaries.

EMERGENCY RESPONSE PHASES

EARLY/PLUME PHASE

A release of radioactive material is in progress and a radioactive plume has moved outside the plant boundaries.

- Initial notification is given to emergency responders and the general public.
- Preparations for radiation field monitoring and sampling of affected areas begin.
- Executive leadership is briefed on the potential need for food embargo zones.

INTERMEDIATE/INGESTION

The release of radioactive material has stopped and field samples undergo analysis.

- Radiation field monitoring and sample collection teams actively work within the contaminated areas.
- Lab analysis of samples takes place.
- Protective actions are considered and implemented.

LATE PHASE

Efforts to reduce radiation levels in affected areas are implemented.

- Implementation of clean up and recover actions designed to reduce long-term exposure and improve living conditions.
- Radiation monitoring and waste disposal continue.
- Radiation protection for public health and the environment continue to be addressed.

RADIOLOGICAL PROTECTIVE ACTION GUIDELINES

During a response and recovery from a nuclear power plant incident, Protective Actions Guidelines (PAGs) are in place to keep the public and emergency responders safe from the harmful effects of radiation. The PAGs are established by the U.S. Environmental Protection Agency (EPA) and are designed to provide safety measures that will reduce or prevent radiation exposure during an emergency.

There are specific PAG measures for emergency responders during a radiological emergency. These measures are based off of units of "rem," which measures health effects of radiation on the human body.



5 rem limit for emergency activity.

10 rem limit for protecting valuable property or critical infrastructure.

25 rem limit for life-saving activities or protecting large populations.

A dose greater than 25 rem for lifesaving activities is allowed if the worker volunteers for the mission and is fully aware of the risks.