RADIOLOGICAL Preparedness

New York State has three commercially licensed nuclear power sites that collectively contain six nuclear power plants. The sites are located at Indian Point in Westchester County; Nine Mile Point in Oswego County; and the R.E. Ginna site in Wayne County.

To meet the public health and safety concerns of the people living within the ten-mile emergency planning zones surrounding each site, SEMO works with the emergency management staffs of seven counties. They are:

- Indian Point: Westchester, Rockland, Orange and Putnam counties
- Nine Mile Point: Oswego County
- R.E. Ginna: Wayne and Monroe counties

PURPOSE

The New York State Radiological Emergency Preparedness Plan (REPP) spells out New York's program for mitigating the possible consequences of a radiological emergency, especially an emergency that might occur at a nuclear power plant. The REPP is built on the premise that, as with any other emergency, all levels of government in concert with private sector organizations, have the responsibility for safeguarding the health and safety of the people through carefully planned and coordinated actions.

The REPP has three major objectives:

1. To protect people living or working near nuclear power facilities, with special emphasis on the 10-mile radius surrounding each plant, called the Emergency Planning Zone (EPZ).
2. To organize and coordinate actions taken by the utility licensee, federal and state agencies, local governments and support groups into a comprehensive, effective response.
3. To effectively allocate and deploy resources and personnel in response to a radiological emergency.

PLANNING AUTHORIZATION

The REPP is an outgrowth of New York's initial emergency plan for radiation accidents (developed in 1971) and New York's Disaster Preparedness Plan, which provides a comprehensive emergency system to prevent or react to all types of emergencies

(tornadoes, floods, blizzards, etc.) New York State's authority is contained in the following documents:

- New York State Executive Law, Article 2-B (1979 and Chapter 708, 1981);
- New York State Public Health Law, Section 201, 206
- New York State Sanitary Code, Part 16;
- New York State Defense Emergency Act, Chapter 784, Laws of 1951.

REPP includes the following components:

- initial notification and warning
- radiological accident assessment and evaluation
- protective actions
    a. access control
    b. sheltering
    c. evacuation
    d. ingestion pathway precautions

- parallel actions
    a. emergency medical services
    b. radiation exposure control
    c. law enforcement and crime prevention
    d. social service
    e. recovery

- public information and education

EMERGENCY RESPONSE

Under the REPP, the following organizations have predesignated radiological emergency roles.

THE COUNTY GOVERNMENT CHIEF EXECUTIVE directs the implementation of their local county preparedness plan. Local governments have developed explicit procedures that parallel state procedures to inform and protect the public.

THE CHAIRMAN OF THE STATE DISASTER PREPAREDNESS COMMISSION (DPC) directs state response activities to protect the public under the auspices of the Disaster Preparedness Commission; the State Health Department is the lead response agency and spearheads radiological assessment and decision making to protect public health.

THE STATE EMERGENCY MANAGEMENT OFFICE (SEMO) is responsible for preparing and updating the plan, including site-specific sections that detail emergency response plans for potentially affected counties. SEMO acts as state/county/utility liaison and, in the event of an emergency, deploys its staff to the utility Emergency Operations Facility (EOF), the appropriate county Emergency Operations Center (EOC) and near-site Joint News Center (JNC) to facilitate implementation of the plan. State agencies support local governments by providing personnel and resource assistance.

According to the plan, the chief executive officer of each county within the 10-mile radius of a nuclear power plant has the responsibility for the first line of protection and may proclaim a local state of emergency to aid response efforts. The chief executive may also ask the governor to declare a "State Disaster Emergency."

With such action, the governor assumes the ultimate authority to command and coordinate the state and local agency response activities.

INCIDENT CLASSIFICATION/NOTIFICATION

In the event of a radiological incident, the nuclear power plant emergency director will immediately notify the State Emergency Management Office (SEMO) and the affected counties via a direct communication line called the Radiological Emergency Communications System (RECS).

The response taken by SEMO will depend on the severity of the incident described by pre-established classifications. Because these four classifications are based on specific plant conditions and measurements, they provide a clear indication of the seriousness of the event.

NOTIFICATION OF UNUSUAL EVENT

This classification provides a means of early notification by the utility of local, state and federal agencies of minor events that could lead to more serious consequences. These events would result in no release of radioactivity beyond the plant boundaries requiring offsite response or monitoring unless further problems occur.

In an Unusual Event, SEMO, the Department of Health and the involved counties are notified via the RECS line; staff members are put on standby and SEMO monitors the situation.

ALERT

Events which are in progress or have occurred involving an actual or potential decrease in the level of safety of the plant would be classified as an Alert. This event will not necessarily result in any release of radioactivity beyond plant boundaries. Any radiation releases to the environment are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure level.

In an Alert, SEMO, the Department of Health and the affected counties are notified; SEMO notifies appropriate state agency staff to report to the Emergency Operations Center (EOC). Public notification may be initiated by the local chief executive. The situation is closely monitored by SEMO.

SITE AREA EMERGENCY

Events are in progress or have occurred where significant radiation releases are possible but are not expected to exceed EPA PAG exposure levels except near the site boundary; and severe damage to the plant's nuclear fuel has not occurred; or which involve actual or major failures of plant functions needed for the protection of the public, are classified as a Site Area Emergency. In this situation, full mobilization of emergency response beyond the plant boundaries would take place, as well as dispatch of radiation monitoring teams if needed.

Response activities for a Site Area Emergency would continue as in an Alert, with additional notification to all ingestion EPZ counties (counties within a 50 mile radius of the affected reactor), activation of the public notification systems and full activation of the state EOC.

GENERAL EMERGENCY

A substantial core degradation or melting with the potential for loss of systems or structures to contain the radioactivity is in progress or has occurred, would result in the classification of a General Emergency. Radiation releases can reasonably be expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

All agencies and organizations involved in radiological emergency preparedness are notified, all EOCs are activated, and all predesignated agency personnel and resources are deployed. If recommended by the Commissioner of Health, protective actions may be advised, such as sheltering or evacuation.

PUBLIC NOTIFICATION OF A RADIOLOGICAL EMERGENCY

Prompt notification systems have been installed surrounding all nuclear power plants in New York State to alert residents within 10 miles of a plant to any emergency situation requiring them to take action. These systems are made up of a combination of sirens, tone alert radios and the Emergency Alert System (EAS).

The emergency sirens are loud, high-pitched signals. In the event of an emergency related to a nuclear power plant, the sirens would be blown continuously for at least three minutes, differentiating them from fire or other emergency sirens which sound only briefly.

A long, uninterrupted siren indicates a hazard that may require action by the public. These sirens do not mean people should leave the area or take any immediate protective actions. A siren tone indicates only that the public should turn on their radios to an Emergency Alert System station in their area. If the sirens are blown, the Emergency Alert System will be the primary source for instructions about any actions that should be taken by the public to ensure their health and safety.

Emergency Alert System messages will be updated to provide the most current and accurate recommendations from county and state health and public safety officials.

If, for any reason, one or more of the special alert sirens fail to operate in any emergency situation, backup provisions have been made for prompt route alerting. In those areas affected by siren failure, public notification will be carried out by predesignated emergency personnel in slow moving vehicles (automobiles/helicopters) equipped with public address systems.

PROTECTIVE ACTION GUIDELINES

The following protection action guidelines (PAG) are used for planning purposes in New York State and are based on the U.S. Environmental Protection Agency's (EPA) guidelines. The recommendations below are based on the dose projections provided by experts during a radiological emergency. Actual decisions and recommendations for protective actions take into consideration a variety of factors, such as wind direction and velocity, time required for public notification and implementation, road conditions, time of day, expected duration of release and impact of decision on public exposure.

Protective Action	PAG (Projected dose)	Comments

Evacuation (or sheltering **a**)	1-5 rem **b**	Evacuations (or for some situations, sheltering **a**) should normally be initiated at 1 rem.
Administration of stable iodine	25 rem **c**	Requires approval of State medical officials

a Sheltering may be the preferred protective action when it will provide protection greater than evacuation, based on the consideration of factors such as source term characteristics, and temporal or other site-specific conditions.

b The sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent incurred from all significant inhalation pathways during the early phase. Committed dose equivalents to the thyroid and to the skin may be 5 to 50 times larger, respectively.

c Committed dose equivalent to the thyroid from radioiodine.

KI - POTASSIUM IODIDE POLICY

When people within the ten-mile emergency planning zone are instructed to evacuate, they will also be instructed to take KI ï Potassium Iodide. This recommendation will be issued by the New York State Commissioner of Health or his/her designee.

The instruction to take KI will be made over the Emergency Alert System and apply to members of the general public, emergency response personnel and special institutions within the area to be evacuated.

The State has provided the counties surrounding the nuclear power plants with a sufficient quantity of KI for distribution to the people in the 10-mile emergency planning zone. Each county is responsible for developing and implementing its own distribution plan. The KI was provided by the Nuclear Regulatory Commission.

Six Facts About KI:

What is it? KI (Potassium Iodide) is an over-the-counter drug that can protect one part of the body - your thyroid - if you are exposed to one form of radiation, radioactive iodine.

How does it work? KI fills your thyroid so that it cannot absorb any radioactive iodine. Each dose lasts for approximately 24 hours.

How much do I take? The dose is one 130 mg pill per person over 1 year of age regardless of size, age or weight. The recommended dose for children less than 1 year of age is 65 mg ï or one half of one KI tablet.

What are the possible side effects to KI? According to the FDA, the benefits of taking KI far exceed the risks. The possible side effects may include gastrointestinal disturbance and minor rash.

How do I know when to I take it?If there is a radioactive radiological release requiring evacuation, an Emergency Alert System message will tell you what areas are being evacuated and requested take KI.

Remember …KI is NOT an alternative to evacuation.

KI only protects your thyroid from one form of radiation. Your best protection against the release of radiation is to leave the area if you are instructed to do so.

WHEN EVACUATION IS ADVISED

Certain conditions at a nuclear power plant could indicate the need for residents in the surrounding areas to temporarily leave their homes or places of business.

The decision to recommend evacuation of specific areas would be made cooperatively by local and state health and public safety officials, based on present and potential plant and meteorological conditions.

Individuals in the affected areas would be notified over the Emergency Alert System (EAS) following the sounding of special radiological emergency sirens.

Anyone in an Emergency Planning Area (ERPA) advised to evacuate should:

- Remain calm. Advice to leave the area will, in most cases, come well before a significant release of radiation, providing adequate time to prepare and leave your home.
- Take one 130 mg dose of KI. Children under one year should be given a 65 mg dose ï one half of the KI tablet.
- Ignore all rumors. Stay tuned to the Emergency Alert System for official instructions.
- Avoid using the telephone to prevent line overloads and interference with emergency use
- Gather items needed for a three-day visit, including:
    - blankets or sleeping bags for each family member
    - prescription medicines, if needed
    - clothing
    - personal items; soap, cosmetic items

    - formula and other needs for infants and children
    - first aid kit
    - checkbook, credit cards and important papers
    - food for any pet you take with you
    - portable radio with batteries
    - flashlight with batteries
    - emergency planning booklet/calendar mailed to your home describing evacuation routes and location of reception centers and congregate care centers
- Proceed to the home of a friend or relative outside the 10-mile Emergency Planning Zone (EPZ) or to your designated reception center. If there has been a release of radiation you will be directed to the reception center for precautionary radiological monitoring.
- Offer a ride to a neighbor who may not have a car
- Close car windows and vents and do not use the air conditioner or heater until beyond the emergency area
- Leave only by the route designated as your location's evacuation route
- If you do not have a ride, walk to the nearest emergency bus pick-up point listed in the emergency planning booklet

RECEPTION CENTERS

Reception centers have been established for use during an emergency. The centers will be operated by county and state health, social services and emergency preparedness officials. The location of the centers can be found in the emergency planning booklet/calendar appropriate to that area.

In the event of an evacuation during an emergency, a reception center can be used as a meeting point for family members with plans to stay at the home of a friend or relative outside the 10-mile Emergency Planning Zone (EPZ), or as a message center. Anyone without arrangements for temporary lodging outside the EPZ should, if advised to evacuate, proceed via the appropriate evacuation route to the reception center. At the center, these individuals will be assigned to a nearby congregate care center operated by the Red Cross. The center will offer food, medical care and communications facilities.

WHEN STAYING INDOORS IS ADVISED

During most types of nuclear power plant emergencies there would be no need for evacuation of surrounding residents, even when the situation indicates that precautionary public protective measures are advisable. Individuals living in the plant vicinity would, in most instances, be best protected from exposure to a short term release of radiation by following special instructions for staying indoors.

The decision to recommend temporary sheltering of people in some geographic areas would be made cooperatively by state and local health and public safety officials, based on present and potential plant and meteorological conditions. Individuals in the affected areas would be notified over the Emergency Alert System (EAS) following the sounding of special radiological emergency sirens.

Anyone in an area advised to take shelter should:

- Stay inside
- Close all windows and doors
- Turn of air conditioners and other ventilation systems
- Extinguish fires in fireplaces and close dampers
- Stay tuned to the Emergency Alert System stations
- Avoid using telephones to prevent overloading lines and interference with emergency use
- Keep family and pets inside the house

WHEN PROTECTIVE ACTIONS ARE RECOMMENDED FOR FARMERS

If an accident at a nuclear power plant has the potential to affect livestock or the quality or marketability of farm products, the agricultural community in the affected areas will receive specific instructions through the media. These instructions will be based on recommendations by local and state officials from the departments of Health and Agriculture and Markets.

The protective actions may be asked to take result from the concern that livestock could eat contaminated feed and water, absorbing radioactive isotopes into their bodies and ultimately passing this contamination into the food chain. This process eventually could contribute to exposure in humans from the ingestion of contaminated products.

As precautionary measures, farmers may be asked to:

- Provide dairy animals with shelter, stored feed and protected water supplies
- Place other livestock on stored feed and protected water and shelter, if possible, after provisions have been made for dairy animals.
- Cover feed if outdoors, or bring feed inside a building
- Store as much water as possible for livestock and cover wells, rain barrels and tanks
- Thoroughly wash crops brought in from a contaminated area; green vegetables exposed to contamination should have outer layers removed
- Temporarily wear protective clothing (like that worn for pesticide applications) when working outdoors

In the event of an accidental release of radiation from a nuclear power facility, milk, soil and crops from farms in the affected area will be monitored and sampled for possible contamination and farmers will be notified of any special precautions necessary.

PUBLIC INFORMATION

In the event of a radiological emergency, the Public Information Officer for the New York State Disaster Preparedness Commission or his/her designee is the New York State spokesperson. All information concerning the state's response to a nuclear power plant emergency will be released by the state spokesperson from the Joint News Center (JNC).

The news media will receive information about state activities only from the Joint News Center.

The state public information officer will receive information directly from the state Emergency Operations Center (EOC) which will have up-to-the-minute information on state, federal and local response activities as well as information concerning accident assessment, changing environmental conditions and post-emergency recovery activities.

Each nuclear power plant site has a designated joint news center from which the state, affected county(ies) and the utility will issue information on all emergency response activities. The state public information officer or a designated deputy will be at this site at all times to keep the public updated on all state response activities through the media.

GETTING THE NEWS DURING A RADIOLOGICAL EMERGENCY

When events that may pose an emergency situation are occurring or are expected to occur at a nuclear power plant, the press will be notified by news releases telephoned to the major wire services by the utility, county and/or state public information officers.

WHAT INFORMATION WILL THE INITIAL WIRE SERVICE RELEASES PROVIDE?

- The nature and extent of the event in progress at the nuclear power plant
- Notification of activation of Joint News Center (JNC).
- Telephone numbers to call to get verified information concerning actions being taken in response to the emergency situation

WHAT IS A JOINT NEWS CENTER (JNC)?

JNCs have been set up near each operating nuclear power site in the state. In the event of an emergency, the center established for the affected plant site would be the source of

all information concerning the utility, state and county response activities. The Joint News Center locations are:

- Westchester County Airport, Building 7, White Plains, NY for Indian Point 2 and 3 Nuclear Power Plants
- 10 Airport Road, Fulton, NY for Nine Mile Point Units 1 and 2, and the James A. FitzPatrick Nuclear Power Plants
- Ginna Nuclear Power Station, 1255 Research Forest, Macedon, NY 14502

UNDER WHAT CONDITIONS WILL THE JOINT NEWS CENTERS BE OPENED?

The JNC established near the affected site will be opened following the declaration of an Alert. Once open, the JNC will function round the clock during the emergency.

WHAT TYPES OF INFORMATION/BRIEFINGS WILL BE AVAILABLE?

The JNC will have the official spokepersons for the utility, state and county (ies). The utility will provide information on plant conditions and utility emergency response actions. The state and county will provide information on public protection actions and governmental emergency response actions.

CAN ANYONE COME TO THE JOINT NEWS CENTERS?

These facilities are for the news media, utility, state and local governmental officials only. Reporters with credentials will be issued an identification badge for access to the JNC.

WILL THERE BE TELEPHONES FOR REPORTERS TO USE?

Yes. Each JNC has telephones for reporters. While a work space has been provided, reporters must bring their own broadcast equipment, computers, typewriters and supplies.

GLOSSARY

Access Control: All activities accomplished for the purpose of controlling entry or re-entry into a restricted zone to minimize the radiation exposure of individuals. This function is needed to prevent the general public from entering the restricted zone and permitting only emergency workers with essential missions and limited members of the general public to enter a restricted zone.

Activation: A process by which a facility or organization is brought up to emergency mode from a normal mode of operation. Activation is completed when the facility is ready to carry out full emergency operations.

Aerial Measuring System (AMS): Department of Energy (DOE) operated aerial radiation surveillance program which may be used for plume verification and ground deposition monitoring.

Airborne Radioactive Material: Any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors or gases.

Area Monitoring: Measurement of radiation level or contamination present in a specific area, building, room, etc.

Assessment: The compilation and analysis of all available accident data and information in order to determine actual and projected radiation doses to the affected population that may result from the accident.

Atmospheric Release Advisory Capability (ARAC): Atmospheric computer modeling system based at Lawrence Livermore National Laboratory - can be utilized for making dose projections.

Background Radiation: Cosmic rays and natural radioactivity are always present in the environment. In addition, man-made sources also may contribute to the background radiation level. The average New Yorker receives approximately 360 millirem per year from radon and background radiation.

Buffer Zone: An area adjacent to a restricted zone, to which residents may return, but for which protective measures are recommended to minimize exposure to radiation.

Chain-of-Custody Form: The documentation of the transfer of samples from one organization/individual to another with respect to the name of the organization/individual and dates of acceptance and/or transfer of samples.

Check Source: A radioisotope with a relatively fixed activity level used to determine the responsiveness of survey instruments.

Chief Elected Official: A County Executive, the Chairman or other presiding Officer of the county legislative body, the Mayor of a city or village, or the Supervisor of a town.

Committed Dose Equivalent (CDE): The dose equivalent to a single organ from an intake of radioactive material during the 50 year period following the exposure.

Congregate Care Center: Facility where shelter and food is provided to evacuees.

Contaminated, injured, or exposed individuals: Individuals who are contaminated and otherwise physically injured, or exposed to high levels of radiation.

Contamination (Radioactive): Deposition of unwanted material on the surfaces of structures, areas, objects, or personnel.

Declared Pregnant Woman: A woman who has voluntarily notified employer, in writing, of her pregnancy.

Decontamination: The reduction or removal of unwanted radioactive material from a structure, area, object or person.

Derived Response Level: A calculated radionuclide concentration food-stuffs, milk, and water, which if ingested without any protective actions, would result in a projected dose commitment equivalent to the preventive or emergency Protective Action Guides (PAGs).

Direction and Control: The management of emergency functions within particular context (e.g., emergency operations center) through leadership and use of authority.

Disaster Preparedness Plan: A plan that details comprehensive emergency procedures for all types of disaster emergencies in the state, i.e. floods, hurricanes etc. A portion of the Disaster Preparedness Plan is the Radiological Emergency Preparedness Plan.

Dose: A generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent.

Dose Equivalent: The product of the absorbed dose in tissue, factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the sievert (Sv) and the Rem (R).

Dose Limits for Emergency Workers: The allowable accumulated during the entire period of the emergency. Action to avoid exceeding the limit is taken based on actual measurements of integrated gamma exposure. In contrast, protection action guides are trigger levels of projected dose at which actions are taken to protect the public. These actions are taken prior to the dose being received.

Dose Rate: The radiation dose delivered per unit of time. Measured, for example, in Roentgen per hour.

Dosimeter: A personnel monitoring instrument that measures the radiation dose received by an individual using the device.

Drill: An event involving organizational responses to a simulated accident to develop, test, and monitor specialized emergency skills that constitute one or more component of an emergency plan and procedure.

Effective Dose Equivalent (EDE): The dose to the body form external radiation sources (assumed to be uniform over the body).

Embargo: A legal order that restricts the movement, distribution, and/or sale of foodstuffs.

Emergency Alert System (EAS): A system which uses commercial radio and television stations to furnish an expedited means of furnishing real time communications to the public in the event of an emergency (i.e., storm warning, local crises, etc.).

Emergency Classifications: The Nuclear Regulatory Commission's classification of the four levels of radiological emergencies are:

- Notification of Unusual Event;
- Alert;
- Site Area Emergency; and
- General Emergency.

Emergency Coordination Center (ECC): A location designated during an emergency by an offsite government agency for the purposes of receiving and promulgating warning information 24 hours a day, 7 days a week.

Emergency Operations Center: A designated location at county and/or state headquarters from which the chief executive and staff can direct the action of the state and local agencies and emergency services.

Emergency Operations Facility (EOF): A facility operated by the licensee for the purpose of evaluating and controlling emergency situations and coordinating responses.

Emergency Operations Plan: A plan that provides comprehensive emergency management for all types of emergencies within the State. The Radiological Emergency Preparedness Plan is an integral part of the State Comprehensive Emergency Management Plan.

Emergency Planning Zone (EPZ): The area surrounding a nuclear power plant site designated for emergency planning purposes. The EPZ encompasses a radius of about 10 miles for the plume exposure pathway and about 50 miles for the ingestion exposure pathway.

Emergency Response Planning Area (ERPA): A subdivision of the plume exposure emergency planning zone; an EPZ is made up of several ERPAs.

Emergency Worker: An individual who has an essential mission within or outside the plume exposure pathway emergency planning zone to protect the health and safety of the public who could be exposed to ionizing radiation from the plume or from its deposition. Some examples of emergency workers are: radiation monitoring personnel; traffic control personnel; evacuation vehicle drivers; fire and rescue personnel, including ambulance crews; medical facilities personnel; emergency operations center personnel; personnel carrying out backup alerting procedures; and essential services or utility personnel.

Evacuation: The removal of the public from an area.

Evacuation Travel Time Estimate: An estimate, contained in emergency plans, of the time that would be required to evacuate general and special populations within the plume pathway emergency planning zone under emergency conditions.

Exclusion Area: The area surrounding a nuclear power plant facility in which the facility operator has the authority to determine and control all activities. No residences exist within a nuclear power plant exclusion zone.

Exercise: An event involving organizational response to a simulated commercial nuclear power plant accident with radiological and other offsite consequences. The purpose of an exercise is to test the integrated capabilities of involved organizations to implement emergency functions set forth in plans and procedures.

Exposure: A measure of the ionization produced in air by X-ray or gamma radiation. The Roentgen (R) is the unit of exposure. The term "dose", sometimes used interchangeably with exposure, actually refers to absorbed radiation.

Exposure Pathways: The ways in which the presence of radioactive materials in the environment lead to potential exposure to humans, i.e., inhalation of airborne radioactive material; ingestion of contaminated food or drink; and whole body exposure to a passing plume or ground contamination.

Exposure Rate: Amount of exposure received per unit of time, i.e., roentgens per second or roentgens per hour. The exposure rate is measured by a radiation detection instrument such as a Geiger counter or an ionization chamber.

Federal Radiological Emergency Response Plan (FRERP): The single Federal plan for coordinating significant Federal response to any civil radiological emergency. The FRERP is intended to facilitate and clarify the Federal role and mechanisms for providing support to State and local governments in a major radiological emergency, if Federal support is required.

Federal Radiological Monitoring Assessment Center (FRMAC): This center is usually located at an airport near the scene of a radiological emergency from which the DOE offsite Technical Director conducts the FRMAP response. This center need not be located near the onsite or Federal-State centers as long as its operations can be coordinated with them.

Federal Response Center: The temporary operations facility for the coordination of federal response and recovery activities.

Federal Response Plan (FRP): This plan establishes the basis for the provision of Federal assistance to a State and its affected local governments impacted by a catastrophic or significant disaster or emergency which results in a requirement for Federal response assistance.

Federal Radiological Monitoring and Assessment Plan (FRMAP): As part of the FRERP, a plan to provide coordinated radiological monitoring and assessment assistance to the State and local governments in response to radiological emergencies.

Film Badge: Film encased in a badge-like holder that records radiation exposure for personnel monitoring purposes. The film usually is processed monthly for calculation of the absorbed dose. Results are reported in millirems (mRems).

Fixed Contamination: Contamination that remains after loose contamination has been removed by decontamination.

Geiger-Mueller Detector: A type of radiation detector that can be used to measure the gamma, or detect beta plus gamma radiation depending on whether the detector is covered by a beta shield.

General Emergency: Indicates that events are in process or have occurred that involve actual or imminent substantial core degradation or melting, with potential for loss of containment integrity. Releases can reasonably be expected to exceed EPA PAG exposure levels offsite, beyond the immediate site area.

General Population: All people in the plume exposure emergency planning zone including residents and transients but not special facility populations in schools, camps, parks.

Half-life: The time required for radioactive material to lose 50% of its activity by radioactive decay.

Host Area: A geographical area outside the plume pathway emergency planning zones where functions such as congregate care, radiological monitoring, decontamination, and registration are conducted.

Ingestion Emergency Planning Zone (EPZ): For planning purposes, the area surrounding the site - within approximately a 50-mile radius - where the principal source of exposure from an accident would be the ingestion of contaminated water or food.

Initial Notification: The first notification by a Nuclear Facility Operator to State and local agencies and the Nuclear Regulatory Commission of one of the four event classifications.

Initial Precautionary Options: A response action taken on the basis of the potential for a release of radioactive materials.

Ionizing Radiation: Any radiation capable of displacing electrons from atoms or molecules, thereby producing ions. (For example, radiation produced by x-ray equipment.)

Joint News Center: The facility used as the central point for dissemination of information by county, State and utility representatives to the news media. This facility is located offsite, and is the only location which allows media access during an emergency.

KI (potassium iodide): A prophylactic drug that can be used effectively to block the uptake of radioiodine by the thyroid gland.

Local Government: For the purposes of the Plan any County, City, Town or Village.

Millirem (mRem): One-thousandth (1/1000) of a rem.

Monitoring: The measurement of radiation levels, usually with a portable survey instrument.

Noble Gases: The chemically inert radioactive gases that are released during an accident at a nuclear power plant.

Nuclear Facility Operator (NFO): The organization licensed by the Nuclear Regulatory Commission to operate a nuclear facility.

Nuclear Reactor: A device in which a fission chain reaction can be initiated, maintained and controlled. Its essential component is a core with fissionable fuel.

Off-Site: Anything outside the site boundary of a particular nuclear power plant facility.

On-Site: Anything inside the site boundary of a nuclear power plant facility.

Personnel Monitoring: Measurement of radiation levels that may have been received by an individual to the whole body or specific organs or body parts. The most common devices used for measuring exposure from external sources are film badges, thermoluminescent dosimeters (TLDs) and pocket dosimeters. Whole body counting or bioassay measurements of breath or excretions may be taken to determine internal intake of radioactive materials.

Personnel Monitoring Center (PMC): Those facilities or locations where individuals and equipment will be monitored for radioactive contamination and decontaminated if necessary.

Plume Exposure Pathway: The area surrounding a nuclear facility site (usually a radius of approximately 10 miles) where the principal exposure would be from: (a) whole body exposure to gamma radiation from the plume and from deposited material, and (b) inhalation exposure from the passing plume.

Portal Monitor: A radiation monitor consisting of several radiation detectors arranged in a fixed position within a frame that forms a passageway for individuals being monitored.

Prevention/Mitigation: The emergency phase that is aimed at eliminating or reducing the probability of the occurrence of a radiological emergency, and in minimizing the impact of a radiological emergency on public health and property.

Projected Dose: The estimated or calculated amount of radiation dose to an individual from exposure to the plume and/or deposited materials, over a period of time, in the absence of protective action.

Protective Action: Any action taken to protect the public's health in response to a radiological emergency, i.e., recommending sheltering or evacuation/KI.

Protective Action Guide (PAG): Projected dose to an individual in the general population that warrants the implementation of protective action. Specific PAG's have been recommended in terms of the level of projected dose that warrants the implementation of evacuation/sheltering, relocation, and limiting the use of contaminated food, water, or animal feed.

Protective Action Recommendation (PAR): NFO recommended protective actions.

Radiation: The emission of energy through a material medium in the form of electromagnetic waves or particles that may impart their energy to the medium through the creation of electrically charged ion pairs. X- and gamma rays and alpha and beta particles are examples of ionizing radiation.

Radioactive Decay: The process by which an unstable nucleus of an atom spontaneously releases energy through the emission of radiation.

Radioactivity: The property of certain nuclides of spontaneously emitting nuclear particles or gamma or X-ray radiation, or of undergoing spontaneous fission.

Radioactive Materials: Material containing atoms having excess energy. It contains excited, unstable atoms that are disintegrating, emitting radiation.

Radioiodines: A family of radioactive iodines - I-131, I-133 and I-135 - these are the radioiodines of primary significance for radiological emergencies involving nuclear power plants.

Radiological Emergency: A situation which may result in the loss of control of a radiation source causing a hazard, or potential hazard, to health or property.

Radiological Monitoring: The detection and measurement of ionizing radiation from radiological releases by means of survey instruments.

Radioactive Release: Introduction of radioactive materials into an uncontrolled environment.

Reception Center: A predesignated location outside the plume exposure pathway through which evacuees will pass to receive initial assistance, radiological monitoring (if required), first aid, or direction to a congregate care center or medical facility.

Recovery: The last phase of activity in the state plan for radiological emergencies; efforts during this stage are to return to pre-emergency conditions.

Re-entry: Temporary entry of individuals into a restricted zone under controlled conditions.

Release: Escape of radioactive materials into the environment.

Relocation: A protective action, taken in the pose-emergency phase, through which individuals not evacuated during the emergency phase are asked to vacate a contaminated area to avoid chronic radiation exposure from deposited radioactive material.

Rem: The unit of dose equivalent in body tissue. It is a measure of radiation exposure that indicates the potential impact on human cells.

Response: The emergency phase in which public protective actions are carried out.

Restricted Zone: An area of controlled access from which the population has been evacuated or relocated.

Return: Reoccupation of areas cleared for unrestricted residence or use by previously evacuated or relocated populations.

Roentgen (R): The unit of radiation exposure in air. Roentgens are the units for quantities of X-ray or gamma radiation measured by detection and survey meters. (For planning purposes 1 Roentgen is equivalent to 1 Rem).

Sampling: Collecting specimens of materials (e.g. soil, vegetation, or radioiodine in the air) at field locations.

Sheltering: An action taken to reduce exposure to radiologically contaminated air by going indoors.

Site Area Emergency: Indicates that events are in process or have occurred that involve actual or likely major failures in the plant functions needed for protecting the public.

Releases are not expected to exceed EPA PAG exposure levels, except near the site boundary.

Special Facility: Institution or location with a special population.

Special Populations: Groups or individuals that may need assistance when protective actions are implemented.

Survey Meter: A portable instrument used to detect and measure ionizing radiation.

Thyroid Blocking Agent: A substance taken as a protective measure to reduce the uptake by the thyroid of radioiodine, e.g., potassium iodine (KI).

Thyroid Exposure: Exposure of the thyroid gland to radioactive isotopes of iodine that have been either inhaled or ingested.

Thermoluminescent Dosimeter (TLD): A dosimetry badge used to measure possible exposure to ionizing radiation. (Permanent record - requires processing to read.)

Total Effective Dose Equivalent (TEDE): The sum of the external and internal exposures; i.e. TEDE = EDE + CDE.

Traffic Control: All activities accomplished for the purpose of facilitating the evacuation of the general public in vehicles along specific routes.

Transportation Emergency: A radiological emergency that occurs during the transportation of radioactive materials.

Whole Body Exposure: Exposure of a major portion of the body to an external radiation field or resulting from the presence of radioactive material distributed throughout the body. Exposure of blood forming organs, gonads, head, trunk and lenses of the eyes is also considered exposure to the whole body.

RADIOLOGICAL MEASUREMENTS

Dose: The amount of energy absorbed by matter received from ionizing radiation per unit mass of matter; expressed in rads.

Exposure: A measure of the ionization produced in air by X- or gamma radiation; expressed in roentgens (R).

Although "dose" and "exposure" often are used interchangeably, the former (dose) is a measurement of energy absorbed in body tissue, the latter (exposure) is a measurement of ionizations in the air due to the presence of radiation.

Rad: Unit of radiation dose.

Roentgen (R): Unit of exposure, applicable only to X- and gamma radiations.

Rem: (Roentgen Equivalent Man) A unit used to express all types of ionizing radiations on a common scale to indicate relative biological effects. For beta and gamma radiations: Exposure to 1 Roentgen delivers a dose of 1 Rad, which is equivalent to 1 Rem.

Curie (Ci): Amount of radioactive material in which 3.7 x 10 atoms decay per second. The rate at which radioactive material is released to the environment may be expressed in units of curies per second (Ci/sec.).

Milli - (m): One-thousandth of a unit (10), i.e., millirem (mRem) XX r milliroentgen (mR).

Micro - z)u): One-millionth of a unit (10).

Pico - (p): One-trillionth of a unit (10).

ABBREVIATIONS AND ACRONYMS

ACP - Access Control Points

A & M - New York State Department of Agriculture and Markets

AMS - Aerial Measuring System

ARAC - Atmospheric Release Advisory Capability

ARC - American National Red Cross

BERP - Bureau of Environmental Radiation Protection

BWR - Boiling Water Reactor

CEDE - Committed Effective Dose Equivalent

CFR - Code of Federal Regulations

CPM - Counts Per Minute

DEC - New York State Department of Environmental Conservation

DEI - Dose Equivalent Iodine

DMNA - New York State Division of Military and Naval Affairs

DOE - United States Department of Energy

DOH - New York State Department of Health

DOT - New York State Department of Transportation

DPC - Disaster Preparedness Commission

DSP - New York State Division of State Police

EAL - Emergency Action Level

EAS - Emergency Alert System

ECL - Emergency Classification Level

EOC - Emergency Operations Center

EOF - Emergency Operations Facility

EPA - United States Environmental Protection Agency

ERDA - New York State Energy Research and Development Authority

EPZ - Emergency Planning Zone

ERPA - Emergency Response Planning Area

ETTE - Evacuation Travel Time Estimate

FDA - United States Food and Drug Administration

FEMA - United States Federal Emergency Management Agency

FRC - Federal Response Center

FRERP - Federal Radiological Emergency Response Plan

FRMAC - Federal Radiological Monitoring & Assessment Plan

FRMAP - Federal Radiological Monitoring and Assessment Plan

FRP - Federal Response Plan

FSAR - (Licensee) Final Safety Analysis Report

GE - General Emergency

JNC - Joint News Center

KI - Potassium Iodide

LNL - Lawrence Livermore National Laboratory

LOA - Letter of Agreement

LOCA - Loss of Coolant Accident

MOU - Memorandum of Understanding

mR - Milliroentgen

NAWAS - National Warning System

NFO - Nuclear Facility Operator

NRC - United States Nuclear Regulatory Commission

NUE - Notification of Unusual Event

NYSPIN - New York State Police Information Network

OGS - New York State Office of General Services

PAG - Protective Action Guide

PAR - Protective Action Recommendation

PIO - Public Information Officer

PWR - Pressurized Water Reactor

R - Roentgen

RAC - Regional Assistance Committee

RACES - Radio Amateur Communications Emergency Service

RAP - Radiological Assistance Plan

RECS - Radiological Emergency Communications System

REM - Roentgen Equivalent Man

REPP - New York State Radiological Emergency Preparedness Plan

SAE - Site Area Emergency

SEMO - State Emergency Management Office

TEDE - Total Effective Dose Equivalent

TSC - Technical Support Center

TCP - Traffic Control Point

TLD - Thermoluminescent Dosimeter

USDA - United States Department of Agriculture