

RADIATION RELEASE

Essential Elements of Information – (EEI)

EEI contain Situational Awareness information on People, Systems, and Services Providers that is critical to acquire in the first and perhaps second operational periods. Specific elements stated here may not apply in every event. Additional elements must be generated as the event evolves through Recovery.

Impact of Event or Scenario

A release of radiation or radioactive materials may occur from a transportation accident or an accident at a nuclear power plant, hospital, laboratory or industrial site. The release could be deliberate as an act of sabotage to food or water sources. The deliberate release could also occur using a radiation dispersal device (RDD) using explosives (a “dirty bomb”) or an aerosolized, non explosive release of radioactive materials from a ground or aerial device. In an explosive detonation there would likely be more injuries from physical trauma than from radiation exposure. Accidental releases could also be accompanied by physical trauma as well as radiation exposure. Certain radioactive isotopes e.g., Plutonium 239, Polonium 210, and Thallium 201 have highly toxic chemical properties.

A deliberate radiation release will result in a criminal investigation which is the responsibility of ESF 16 Law Enforcement. Immediate response to a radiation release may involve ESF 10 Hazardous Materials and ESF 4 Firefighting in support at the county-level.

The Department of Health Bureau of Radiation Control (BRC) is required by F.S. 404 to respond to any emergency which involves possible or actual release of radioactive material, carry out or supervise any required decontamination, and otherwise protect the public health and safety. As part of their responsibilities the BRC will dispatch monitoring and assessment teams to the release site and serve as Technical Specialists in the ESF 8 Planning Section. The BRC also has significant assets for the monitoring of the general public for radioactive contamination. The 44th Civil Support Team is a Florida National Guard Unit with radiation assessment and decontamination capabilities. This unit could be requested to augment on the scene response through ESF 13. Depending on size and type of the release, a Federal Radiological Monitoring and Assessment Center could be established to support State response efforts.

Depending on weather conditions and characteristics of the radioactive material, the release may create a downwind hazard. Depending on the speed, direction, and duration of the downwind hazard, local decisions will be made to shelter in place or evacuate. Evacuation may require setting up hasty shelters. There may not be time initially for special needs shelters.

Those closest to the release may require decontamination and shelter support for longer time periods than those further downwind. Responders and victims with non-life threatening injuries who are contaminated will require decontamination near the scene. Injured victims with life threatening injuries should be transported to the receiving hospital where decontamination may be provided after victims are stabilized. Fatalities at the radiation release site may also require decontamination prior to further processing.

PPE issued for protection from biological and chemical hazards will not provide protection from gamma and neutron radiation. It will offer substantial protection from sources emitting alpha and beta radiation and prevent inhalation and skin contact with these sources.

Depending on the intensity and duration of radiation exposure, there may be chronic physical health effects lasting days to weeks to months that will require medical surveillance. Behavioral health, which would not be induced by radiation exposure, may also require monitoring and treatment over time. Cancer surveillance may continue for decades.

The EEI listed below will be needed by the ESF 8 Situation Unit to determine current situation and forecast response strategies during the immediate response phase and chronic condition surveillance phase.

People

People include vulnerable populations, the general population, and responders. Vulnerable populations may be classified as static or transitory.

Static populations consist of people who have medically complex conditions, those who are functionally disabled, frail-elderly, and children who are two years old or younger. Evacuation of persons in this category can exacerbate their medical condition causing stress and behavioral health issues.

Transitory populations are those who have chronic medical conditions, seniors in high-rise buildings, and children older than two years old.

Populations in both categories are vulnerable to extreme stress from a radiation release event with a resultant evacuation. Persons with disabilities may have physical difficulty complying with broadcast shelter-in-place requirements. A radiation release event may require immediate and perhaps extended behavioral health assistance and support.

Depending on the intensity and duration of radiation exposure, there may be chronic physical health effects lasting days to weeks to months that will require medical surveillance.

Cancer surveillance may continue for decades. Behavioral health issues may also require monitoring and treatment over time.

There may be large numbers of transient vulnerable populations (tourists) that will require post-event assistance, as well.

Systems

Systems include healthcare, medical care, infrastructure, transportation, and communications. Event damage of those in the vicinity of an explosive or airplane crash and power loss will reduce or negate the effectiveness of key systems when they are most needed for recovery.

There are isotope-specific antidotes and chelating agents available for distribution following a radiological release. Potassium iodine (KI) is the common antidote to reduce effects from radioactive iodine. KI is widely stocked in counties where there is a potential for a radioactive release from a nuclear power plant. There are also stocks of KI available at the DOH central pharmacy and through vendor managed inventory.

Prussian blue is effective for radioactive isotopes of Cesium and Thallium. It is available by request from the Strategic National Stockpile (SNS).

DTPA (Diethylene triamine pentaacetic acid) is a chelating agent for Plutonium, Americium, and Curium isotopes. DTPA is also available by request from the SNS.

Service Providers

Service providers are those who provide health and medical care and support services. Damaged facilities, power loss, and traffic disruptions will reduce or negate the ability of service providers to serve affected populations.

References:

Annex A Florida Comprehensive Emergency Management Plan (CEMP) – information on nuclear power plant accident response.

Annex E Florida CEMP – information on RDD and accidental radiation releases other than from nuclear power plants.

Immediate Response Phase

- Radiation release identification and characteristics – isotope(s), radiation intensity, duration ($\frac{1}{2}$ Life) and toxic chemical properties
- Downwind hazard -- Software modeling to be conducted by National Atmospheric Release Advisory Center (NARAC) in consultation with BRC.

People

- Residential areas in downwind hazard zone.
- Vulnerable populations in downwind hazard zone.
- Residential areas ordered to evacuate.
- Location and populations of shelters – general and special needs.
- Number of injuries and type.
- Number of fatalities at the scene and those who expire from injuries or radiation effects.
- Rumors being spread about the radiation release – coordination with ESF 14.

Systems

- Requests for SNS distribution of isotope-specific antidotes (e.g., potassium iodine, Prussian blue, and DTPA) if applicable.
- Systems within the downwind hazard
- Location and populations of shelters – general and special needs.
- Need for Family Re-unification services and Behavioral Health teams.
- Locations of decontamination stations and number of persons processed.
- Need for temporary clothing replacement and blankets for persons who are decontaminated.
- Need for resupply of PPE and compressed air to responders.
- BRC response teams dispatched.
- Status 44th Civil Support Team is a Florida National Guard Unit
- Status of Federal asset deployment status and location
- Epi Strike teams dispatched
- Environmental Health Strike Teams dispatched
- Locations and missions for RERAs.
- Information on coping/stress reduction/psychological first aid

Service Providers

- Health and medical facilities in the downwind hazard zone
- Residential areas ordered to evacuate.
- Hospitals receiving injuries.
- Need for Hospital and other service providers for decontamination augmentation support.
- Need for PPE and decon resupply.
- Need for radiological antidotes and chelating agents.
- Regional Disaster Behavioral Health Assessment Teams deployed – number and location

Chronic Condition Surveillance Phase -- Essential Elements of Information

People

- Numbers and locations of persons with chronic conditions resulting from the radiation release.
- Epi Strike Teams/Staff deployed for chronic condition surveillance
- Types of conditions being seen.
- Trends in morbidity and mortality.
- Numbers of persons with lingering behavioral health issues.
- Rumors being spread among and about persons with the chronic effects – coordination with ESF 14.

Systems

- Resupply of isotope-specific antidotes if needed.
- Information on coping/stress reduction/psychological first aid

Service Providers

- Health and medical support being given.
- Shortfalls in support that need to be addressed.
- Regional Disaster Behavioral Health Assessment Teams deployed – number and location