TEAM NORFOLK

Emergency Operations & Resiliency Framework

Hazard-Specific Annex

Hazardous Materials - Radiological

May 2025

CONTENTS

Team Norfolk Hazard-Specific Annex

Hazardous Materials Radiological

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PURPOSE

The purpose of this Hazard-Specific Annex is to establish a comprehensive and coordinated framework for the City of Norfolk and its emergency response partners to effectively prepare for, respond to, and recover from a radiological incident. This annex outlines key roles, responsibilities, and procedures to guide operations during radiological emergencies, including incidents involving Radiological Dispersal Devices (RDDs), lost or stolen sources, transportation-related spills, and fixed facility releases.

This plan supports compliance with applicable federal, state, and local laws, including the Code of Virginia, the Commonwealth of Virginia Radiological Emergency Response Plan (RERP), and relevant FEMA guidance. It also ensures alignment with the National Response Framework (NRF), the National Incident Management System (NIMS), and Norfolk's Emergency Operations Plan (EOP).

By promoting unity of effort among local departments, regional partners, state and federal agencies, and private-sector stakeholders, this annex enhances Norfolk's radiological preparedness and ensures a timely and effective response that prioritizes public safety, incident stabilization, and environmental protection.

SCOPE

This annex applies to all departments, agencies, and organizations with assigned responsibilities in the City of Norfolk's Emergency Operations Plan (EOP) that may be involved in the response to a radiological incident. It encompasses preparedness, response, and recovery operations related to radiological hazards, including but not limited to:

- Radiological Dispersal Devices (RDDs), also known as "dirty bombs"
- Transportation accidents involving radioactive materials by road, rail, air, or maritime vessels
- Fixed facility incidents, such as those occurring at industrial sites, medical facilities, shipyards, or research laboratories
- Lost, stolen, or orphaned radioactive sources
- Unintentional releases or spills of radiological material
- Intentional acts involving radiological agents, including terrorism or sabotage

The scope includes actions taken at the scene of the incident, in the Emergency Operations Center (EOC), and in affected community areas. It covers coordination with regional partners, the Virginia Department of Emergency Management (VDEM), federal response agencies such as the U.S.

Department of Energy (DOE) and Environmental Protection Agency (EPA), and key private sector and infrastructure stakeholders.

This annex does not address radiological emergencies related to nuclear power plants, which are addressed under separate federal and state plans.

BACKGROUND

A radiological incident—whether accidental or intentional—involves the actual or potential release of radioactive materials into the environment, posing risks to public health, safety, and the environment. Radiological hazards are particularly challenging because radiation is invisible, odorless, tasteless, and cannot be detected by human senses. As such, specialized equipment and trained personnel are required to identify and assess radiological contamination.

Radiological incidents may take various forms, including:

- Intentional acts, such as the detonation of a Radiological Dispersal Device (RDD or "dirty bomb"), which combines conventional explosives with radioactive material to spread contamination and cause psychological disruption.
- Unintentional releases during the use, storage, or transportation of radioactive materials in medical, industrial, or research settings.

The City of Norfolk faces potential exposure to radiological hazards due to its role as a regional hub for transportation, shipping, port operations, and healthcare services. Sources of risk include:

- Hospitals and medical centers utilizing radiological isotopes for diagnosis and treatment
- University laboratories conducting research with radiological materials
- Industrial and port operations that may involve radiological sources
- Highway, rail, and maritime transport of radioactive materials through the city
- Proximity to U.S. Navy and other federal installations with radiological assets

Despite these potential risks, radiological materials and activities are heavily regulated by agencies such as the Nuclear Regulatory Commission (NRC), U.S. Department of Transportation (DOT), and the Environmental Protection Agency (EPA), along with the Virginia Department of Health (VDH) and Virginia Department of Emergency Management (VDEM). These regulatory frameworks, along with local safety practices, make the likelihood of a large-scale incident relatively low; however, the consequences of such an event necessitate robust planning, rapid response, and effective coordination among local, state, and federal partners.

SITUATION

Radiological emergencies may arise from both unintentional accidents and deliberate acts. Although relatively rare, these incidents can present significant public health, environmental, and security risks. The City of Norfolk faces potential exposure due to its transportation corridors, critical infrastructure, medical and research institutions, and proximity to military and port operations.

ACCIDENTAL RADIOLOGICAL INCIDENTS

Most radiological emergencies involve the loss, theft, or mishandling of relatively low-level radioactive sources. These sources are widely used in medical, academic, industrial, and research applications. Radiological materials may be present in:

- Hospitals and healthcare facilities
- Research institutions and universities
- Industrial radiography operations
- Port operations and shipping containers
- Transportation routes, including highways, railways, and maritime vessels

Additionally, natural hazards such as hurricanes, flooding, earthquakes, or structural fires could damage facilities that store or use radioactive materials, potentially resulting in a release.

Examples of accidental incidents include:

- Accidents at U.S. nuclear facilities or research reactors
- Orphaned, lost, or stolen radioactive sources
- Transportation accidents involving radioactive shipments
- Breaches or malfunctions at facilities handling radiological materials
- Domestic nuclear weapons accidents (highly unlikely but federally planned for)
- Launch or reentry incidents involving spacecraft with nuclear power sources

While heavily regulated by federal and state agencies (e.g., the NRC, EPA, DOT, and VDH), accidental radiological incidents can still occur, and require swift coordination among public safety, health, and environmental response teams.

INTENTIONAL RADIOLOGICAL THREATS

The use of radiological materials as weapons—whether through an Improvised Explosive Device (IED), Radiological Dispersal Device (RDD or “dirty bomb”), or an Improvised Nuclear Device (IND)—represents a low-probability but high-impact threat. Given Norfolk’s urban density, critical infrastructure, and regional importance, the city could be a potential target.

Dirty Bomb / Radiological Dispersal Device (RDD)

According to the Centers for Disease Control and Prevention (CDC), a dirty bomb is a type of RDD that uses conventional explosives to spread radioactive material. These devices are not capable of creating a nuclear detonation, but they are designed to cause fear, disruption, and contamination.

Key facts:

- A dirty bomb combines explosives (e.g., dynamite) with radioactive material (powder or pellets)
- The explosion itself causes the most immediate harm; radiation exposure is generally localized
- Radioactive dust or smoke could contaminate surfaces, water, or air, posing a health hazard
- People near the blast may require decontamination and medical treatment
- Evacuation or shelter-in-place orders may be necessary to limit exposure

IMPROVISED NUCLEAR DEVICE (IND)

An IND is a functional nuclear weapon constructed outside official military control, often through illicit means. While extremely difficult to build and acquire, the detonation of an IND would have catastrophic consequences.

Per the CDC, an IND detonation would cause:

- A massive fireball and blast wave with widespread destruction
- Intense heat and light, leading to burns and temporary or permanent blindness
- Radiation sickness (Acute Radiation Syndrome) in exposed populations
- Fallout carried by the wind, contaminating areas miles from the detonation

Impacts from fallout include:

- Internal and external contamination
- Radiation sickness in downwind populations
- Disruption of food and water supplies due to contamination

ADDITIONAL CONSIDERATIONS

- Secondary Explosions: Terrorist devices may be accompanied by secondary devices to target responders or critical infrastructure.
- Hazardous Materials: Radiological incidents may involve or trigger the release of hazardous chemicals requiring specialized PPE and medical care.
- Response Timing: The chance of survivor rescue declines sharply after 72 hours in large-scale explosive events.

- Infrastructure Disruption: Damage to transportation, power, water, and communication systems may further complicate response and recovery operations.
- Waterborne and Port-Based Risks: Norfolk's maritime operations present potential exposure to radiological materials via commercial shipping or underwater IEDs.

FACTS AND ASSUMPTIONS

The following information represents facts and planning assumptions used to develop the planning environment for the Radiological Incident Annex. These elements inform preparedness, guide operational planning, and help define the scope of potential response and recovery efforts within the City of Norfolk.

FACTS:

- Radiological or nuclear incidents present unique operational, logistical, and health challenges for traditional first responders, emergency managers, healthcare providers, and support agencies.
- A radiological incident can occur without warning and may affect multiple jurisdictions or population centers. Impacts may include mass casualties, significant property damage, economic disruption, and environmental contamination.
- A large-scale radiological incident is likely to exceed the capabilities of local, state, and regional resources, necessitating federal support and coordination under the National Response Framework (NRF).
- The public's limited understanding of radiological hazards makes clear, consistent, unified, and timely public messaging critical. Well-executed risk communication can reduce panic, improve compliance with protective actions, and save lives.
- Radiological terrorism or intentional release events may involve complex crime scenes that require coordination between law enforcement and emergency response personnel. Evidence preservation and site security are essential components of response.
- Protective action decisions must be based on the three core principles of radiation safety:
    - Time: Minimize time spent near radioactive sources to reduce exposure.
    - Distance: Maximize the distance from the source to reduce radiation dose.
    - Shielding: Use dense materials (e.g., concrete, earth, steel) as barriers between individuals and the radiation source.
- Norfolk Fire-Rescue (NFR), in coordination with the Norfolk Emergency Operations Center (EOC) and in consultation with public health and law enforcement partners, is the lead agency for implementing protective action decisions. These may include:
    - Evacuation or shelter-in-place orders
    - Decontamination procedures for individuals or property
    - Distribution of radioprotective medications (e.g., potassium iodide, if applicable)
    - Restrictions on contaminated food or water supplies
    - Long-term relocation, environmental monitoring, and remediation

ASSUMPTIONS:

In the absence of verified information, the following planning assumptions are considered to be true for the purpose of developing this annex. These assumptions provide a basis for preparedness and operational decision-making and may be updated as facts emerge during response and recovery.

- As the scale and complexity of a radiological incident increase, multi-agency coordination through the Norfolk Emergency Operations Center (EOC) will be required to synchronize response across city departments, regional partners, and state and federal agencies.
- A complex radiological incident—especially one involving intentional release—will require specialized equipment, technical expertise, and highly trained personnel, which may be limited or delayed due to competition for resources, including fears of follow-on attacks.
- Public fear and anxiety about radiation may:
    - Result in spontaneous evacuation from areas not at risk
    - Cause a medical surge at healthcare facilities from people not exposed but concerned
    - Lead to widespread behavioral health impacts, including depression, anxiety, and PTSD among survivors and responders
- Behavioral health resources will likely be overwhelmed. Long-term mental health services will be required for affected residents, first responders, and healthcare professionals.
- City employees and critical workers may be reluctant to perform assigned duties due to fears of exposure or contamination, requiring enhanced risk communication, protective measures, and continuity planning.
- Federal military support may be required. Department of Defense (DoD) assets may be deployed under Immediate Response Authority. Continued presence will require operational control through U.S. Northern Command (USNORTHCOM) and formal approval processes.
- National Guard forces may respond under a Governor's authority or via EMAC agreements. When operating in a non-Title 10 (state-controlled) status, they will not be under federal control.
- A radiological incident may involve:
    - Localized contamination from small-scale incidents (e.g., orphan sources, RDDs)
    - Widespread regional impacts in the event of an Improvised Nuclear Device (IND) or sabotage of nuclear infrastructure
- Time-sensitive protective actions (e.g., evacuation, shelter-in-place) will be necessary to reduce radiation exposure to the public. These decisions must be made and communicated rapidly based on the type of incident and plume modeling data.
- Effective response will require close coordination with local departments, neighboring jurisdictions, Hampton Roads regional partners, the Virginia Department of Emergency Management (VDEM), and federal response agencies such as FEMA, EPA, and the DOE.
- Specialized training, equipment, and protocols for radiation detection, PPE, decontamination, and medical management of contaminated individuals will be essential for first responders and healthcare providers.
- A significant radiological event may result in:
    - Mass casualties requiring triage, decontamination, and surge medical care
    - Overwhelmed EMS systems, hospitals, and public health infrastructure

- Emergency shelters may be needed for displaced individuals due to blast damage, contamination, or access restrictions within security perimeters.
- Long-term recovery needs may include housing assistance, unemployment support, economic stabilization efforts, and environmental remediation. Local government may be required to support displaced populations and impacted businesses for extended periods.

CONCEPT OF OPERATIONS

Radiological incidents can vary widely in scope, origin, and impact—ranging from small-scale accidents involving medical isotopes to large-scale acts of terrorism using Radiological Dispersal Devices (RDDs) or Improvised Nuclear Devices (INDs). Most incidents will be managed at the local level, with Norfolk Fire-Rescue (NFR) as the initial responding agency. However, complex or widespread incidents will require a coordinated, multi-jurisdictional response, involving regional, state, and federal assets.

OPERATIONAL PRIORITIES

The initial goals and objectives for all radiological incidents are:

- Preservation of life and public safety
    - Ensure responder safety through the use of Personal Protective Equipment (PPE), radiation detection monitors, and operational awareness.
    - Establish site control and contamination zones (Hot/Exclusion, Warm/Reduction, Cold/Support) based on radiation surveys and plume modeling.
- Scene assessment and hazard control
    - Identify and characterize the radiological source.
    - Prevent further contamination, isolate the affected area, and stabilize the source.
    - Coordinate incident security and access control with Norfolk Police and partner agencies.
- Effective communication and coordination
    - Maintain continuous contact between the Incident Command Post (ICP), the Norfolk Emergency Operations Center (EOC), and external response agencies.
    - Activate the Joint Information Center (JIC) for unified messaging and public information.

PROTECTIVE ACTIONS AND PUBLIC WARNING

In the event of a life-threatening radiological release, the Norfolk EOC will issue immediate life-safety warnings via Wireless Emergency Alerts (WEA) and the Emergency Alert System (EAS). These messages may instruct the public to evacuate, shelter-in-place, or avoid contaminated areas.

Follow-up information and situation updates will be disseminated through:

- Norfolk Alert
- City websites and social media channels
- The Joint Information Center (JIC)
- Coordination with regional media partners

The Policy Group, which includes senior city officials and Communications leadership, will be notified immediately following life-safety alert dissemination and will support broader messaging and strategic decision-making.

INCIDENT MANAGEMENT STRUCTURE

- Norfolk Fire-Rescue (NFR) will assume initial Incident Command, with the primary mission of protecting life, stabilizing the incident, and coordinating on-site operations.

- As the situation escalates, the City will transition to a Unified Command (UC) structure involving local, state, and federal response partners.

- The Norfolk EOC will be activated to support logistics, coordination, and multi-agency operations.

STATE COORDINATION AND SUPPORT

- The Virginia Department of Emergency Management (VDEM) serves as the coordinating agency for state-level radiological incident response.
    - VDEM will activate its Radiological Emergency Preparedness (REP) program to coordinate with impacted localities, particularly for events involving the North Anna or Surry nuclear power stations.
    - VDEM notifies and coordinates with the Virginia Department of Health (VDH) and other state agencies.
- VDH Office of Radiological Health
    - Maintains a 24/7 duty officer to assist localities.
    - Assesses off-site radiation distribution and provides protective action recommendations (e.g., evacuation, shelter-in-place, food and water restrictions).
    - Continuously monitors the radiological environment and provides technical guidance throughout the incident.

FEDERAL COORDINATION AND RESOURCES

- The Environmental Protection Agency (EPA) may:
    - Lead or support environmental assessment and remediation.
    - Provide technical guidance and oversight for response and cleanup activities.
    - Exercising its discretionary authority under the Superfund program to direct or perform cleanup of radiological contaminants.
- Federal Emergency Management Agency (FEMA)
    - Oversees national-level coordination and consequence management.
    - Deploys the Nuclear Incident Response Team (NIRT), composed of experts from:
    - Department of Energy (DOE)/National Nuclear Security Administration (NNSA)
    - EPA

- Other federal agencies with specialized nuclear and radiological response capabilities.

- NIRT Capabilities Include:
  - Assessing and characterizing radiological/nuclear threats
  - Supporting incident response to nuclear terrorism or major accidents
  - Advising state, local, tribal, and territorial (SLTT) officials on response strategy
  - Assisting with modeling and assessment through the Interagency Modeling and Atmospheric Assessment Center (IMAAC), which provides predictive plume modeling and consequence forecasting

POTENTIAL SOURCES OF RADIOLOGICAL EMERGENCIES

The City of Norfolk and the surrounding Hampton Roads region contain multiple facilities, transportation nodes, and operational activities involving radioactive materials. These sources present a low-probability but high-consequence risk for radiological emergencies due to accidental release, equipment failure, natural hazards, or deliberate acts.

NAVAL STATION NORFOLK (NSN)

Naval Station Norfolk is the largest naval base in the world and hosts a substantial number of nuclear-powered vessels, including aircraft carriers and submarines. The proximity of these vessels to the federally controlled navigation channel—used by large commercial container ships—introduces a complex risk environment. While port security barriers provide a deterrent, a deliberate ramming or collision incident could threaten vessels with onboard nuclear reactors, especially while docked at one of NSN's 13 piers.

NORFOLK NAVAL SHIPYARD (NNSY), PORTSMOUTH

Located across the Elizabeth River in Portsmouth, the Norfolk Naval Shipyard conducts maintenance, overhaul, and decommissioning of nuclear-powered naval vessels. All nuclear activities at NNSY fall under the oversight of the Naval Nuclear Propulsion Program (NNPP), a joint program of the U.S. Navy, Department of Energy (DOE), and National Nuclear Security Administration (NNSA). While regulatory controls are rigorous, the potential for a localized radiological emergency still exists during maintenance or fuel handling operations.

NORTHROP GRUMMAN NEWPORT NEWS SHIPYARD (NGNN)

Situated in Newport News along the James River, this facility supports new construction, refueling, and repair of nuclear-powered aircraft carriers and submarines. Like NNSY, NGNN operates under the NNPP and adheres to stringent safety protocols, but its operations still represent a potential source of radiological risk for the greater Hampton Roads region.

4. Norfolk International Terminals (NIT)

As the Virginia Port Authority's largest terminal, NIT spans over 567 acres along the Elizabeth and Lafayette Rivers. The terminal supports intermodal cargo movement and has the capacity to receive and transfer radioactive material shipments via vessel, rail, or highway. Given its direct access to Norfolk Southern's Heartland Corridor, radiological cargo passing through NIT could present an exposure risk in the event of a transportation accident or security breach.

CRANEY ISLAND FUEL DEPOT

Craney Island supports the Department of Defense's (DoD) largest fuel transfer volume, distributing over one-third of the Navy's global fuel supply. Though not a direct radiological source, the strategic nature of this facility makes it a potential target for adversarial actions. Any incident that disrupts or damages the depot, especially one involving radiological sabotage, could produce complex response challenges for regional emergency management.

MEDICAL AND RESEARCH FACILITIES

Hospitals, outpatient clinics, and biomedical research laboratories across Norfolk routinely use radioactive isotopes for:

- Diagnostic imaging (e.g., PET scans)
- Radiation therapy for cancer treatment
- Scientific research in nuclear medicine or molecular biology
- Loss or mishandling of radiological sources in these settings can lead to localized contamination or exposure events.

EDUCATIONAL INSTITUTIONS

Universities and colleges in the region with advanced science, engineering, or health programs may house small research reactors or radioactive source laboratories. These facilities are subject to regulatory oversight but still pose a risk if radioactive material is lost, stolen, or inadvertently released.

INDUSTRIAL AND MANUFACTURING FACILITIES

Certain industrial operations, including those in aerospace, manufacturing, non-destructive testing, or power systems, use sealed radioactive sources in their processes. These materials, if mishandled or improperly secured, can become orphaned sources or targets of theft.

RADIATION ONCOLOGY CENTERS

Several specialized cancer treatment centers in and around Norfolk utilize high-energy radiation and sealed sources for patient care. Incidents involving radiation therapy equipment, though rare, could pose a threat to staff, patients, and the surrounding community if shielding is compromised or a device is damaged.

SURRY NUCLEAR POWER STATION

Located approximately 40 miles northwest of Norfolk, the Surry Power Station is a commercial nuclear power facility operated by Dominion Energy. Although not within city limits, a significant incident at the plant, such as a radioactive release or reactor emergency, could impact portions of the Hampton Roads region, including Norfolk, depending on prevailing wind patterns and atmospheric conditions. The facility is governed by the U.S. Nuclear Regulatory Commission and is included in the Virginia Radiological Emergency Preparedness (REP) Program, which conducts annual drills with local, state, and federal partners to ensure coordinated response capabilities.

TRANSPORTATION ACCIDENTS

Due to Norfolk's strategic role as a major port city and intermodal transportation hub, the movement of radioactive materials through the region is a routine occurrence. These materials may be in transit to support commercial nuclear power facilities, military installations, medical and industrial users, or research institutions.

The primary mode of transportation for radioactive materials is by truck, although shipments may also occur via rail, cargo ships, or aircraft. The presence of major highways, railway lines, port terminals, and Norfolk International Airport increases the likelihood that radioactive materials may temporarily pass through or be staged within city limits.

Transportation accidents involving radioactive materials can result in the release of hazardous substances, public exposure, and the need for rapid coordination between local, state, and federal response partners. These incidents may require:

- Scene isolation and establishment of protective zones
- Hazard identification and radiation monitoring
- Decontamination of people, vehicles, or cargo
- Public protective actions such as shelter-in-place or evacuation
- Specialized packaging and recovery operations for damaged materials
- Radiological transportation incidents are addressed under the:
- Commonwealth of Virginia Radiological Emergency Response Annex
- Commonwealth of Virginia Terrorism Consequence Management Annex

These annexes provide detailed protocols for notification, interagency coordination, protective action recommendations, and federal assistance. Norfolk Emergency Management will coordinate with VDEM, VDH, and first responders to implement protective measures and manage public messaging during any transportation-related radiological event.

NUCLEAR WEAPON ACCIDENT

A nuclear weapon accident, though highly unlikely, poses complex and severe challenges that require rapid, multi-agency coordination. The immediate priorities during such an incident are protection of

public health and safety, security of classified materials, public information management, and containment and recovery of the weapon or components.

In addition to the core response areas, several critical functional concerns must be addressed:

- Medical Assistance: Emergency medical services must be prepared to provide triage, treatment, and potential decontamination for those injured or exposed.
- Site Security: The accident scene will be both a hazardous materials zone and a national security site. Strict access control and coordination with federal law enforcement and military assets will be required.
- Public Affairs and Risk Communication: Accurate, timely, and coordinated messaging is essential to manage public fear, reduce misinformation, and support protective action guidance.
- Classified Information Protection: Safeguarding sensitive national security information and components of the weapon system is a federal priority and will be managed under strict protocols.
- Weapons Recovery and Technical Operations: These efforts will be led by the U.S. Department of Defense (DoD) and Department of Energy (DOE), with support from technical experts and specialized response teams.
- Environmental and Site Restoration: Long-term cleanup and remediation of contaminated areas may be necessary, with oversight by the EPA and coordination through state and local agencies.
- Legal and Jurisdictional Considerations: Legal authority for weapons recovery, environmental response, and law enforcement activities will be clearly delineated among local, state, and federal partners.
- Logistical Support and Resource Coordination: Significant logistical capabilities may be required, including staging areas, communications infrastructure, and support for deployed federal teams.
- Interagency Coordination: Integration of response activities will be essential across all levels of government, including Norfolk's EOC, state officials, and federal agencies under the National Response Framework and Nuclear Weapons Accident Response Plan (NARP).

While the likelihood of a nuclear weapons accident occurring in or near Norfolk is extremely low, the city's proximity to major military installations and naval operations necessitates planning for such a scenario. Local response agencies will work in support of the lead federal agency and ensure local protective measures are implemented swiftly.

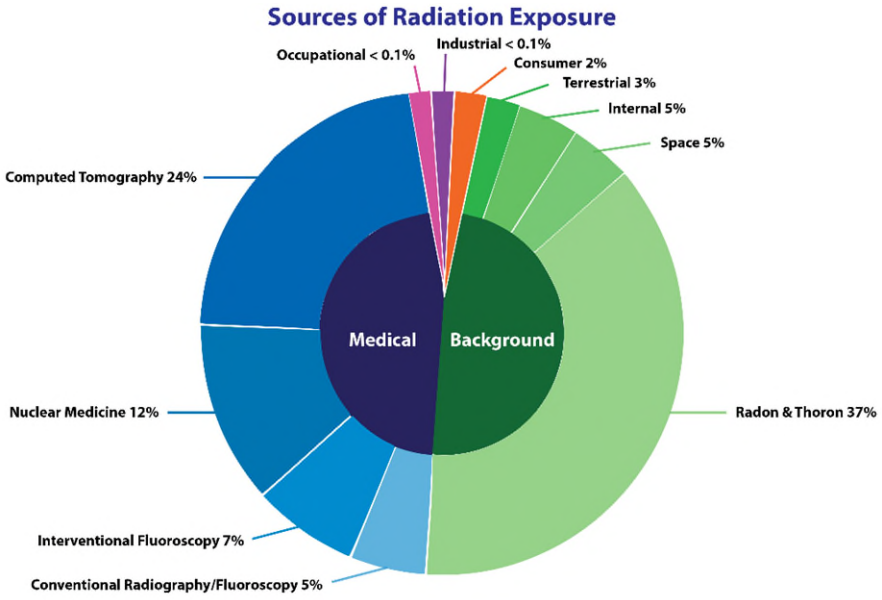
ROUTINE RADIATION EXPOSURE

Radiation is a natural part of the environment, and all individuals are exposed to it daily from both natural and man-made sources. This routine exposure is referred to as background radiation and includes sources such as cosmic rays, radon gas, soil and rocks, food, and water, as well as medical procedures like X-rays, CT scans, and nuclear medicine treatments.

According to the National Council on Radiation Protection and Measurements (NCRP), the average annual radiation dose received by a person in the United States is approximately 6.2 millisieverts (620 millirems). This total dose comes from a combination of the following sources:

- Natural background radiation (about 50 percent), including:
  - Radon gas
  - Cosmic radiation
  - Terrestrial radiation from soil and rocks
  - Internal radiation from ingestion of naturally radioactive materials
- Medical exposure (about 48 percent), including:
  - Diagnostic imaging (X-rays, CT scans)
  - Nuclear medicine
  - Radiation therapy
- Consumer products and other sources (about 2 percent), such as:
  - Smoke detectors
  - Building materials
  - Airport screening equipment
  - Occupational exposure in specialized fields

Understanding the nature and scale of routine radiation exposure is important for placing emergency radiation doses into context. For example, a chest X-ray delivers approximately 0.1 millisieverts, while a CT scan of the abdomen may deliver 10 millisieverts or more. These comparisons can help emergency officials communicate risk more effectively during radiological incidents.



Average Annual Radiation Dose

Sources	Radon & Thoron	Computed Tomography	Nuclear Medicine	Interventional Fluoroscopy	Space	Conventional Radiography/ Fluoroscopy	Internal	Terrestrial	Consumer	Occupational	Industrial
Units											
mrem (United States)	228 mrem	147 mrem	77 mrem	43 mrem	33 mrem	33 mrem	29 mrem	21 mrem	13 mrem	0.5 mrem	0.3 mrem
mSv (International)	2.28 mSv	1.47 mSv	0.77 mSv	0.43 mSv	0.33 mSv	0.33mSv	0.29 mSv	0.21 mSv	0.13 mSv	0.005 mSv	0.003 mSv

(Source: National Council on Radiation Protection & Measurements, Report No. 160)

IONIZING RADIATION VS NON-IONIZING RADIATION

Radiation is a form of energy that travels through space in the form of waves or energized particles. It can originate from unstable atoms undergoing radioactive decay or be generated by man-made devices. Radiation varies in strength, form, and biological impact.

There are two primary types of radiation relevant to emergency planning:

Non-Ionizing Radiation

Non-ionizing radiation has insufficient energy to remove electrons from atoms or molecules. Instead, it can cause atoms to vibrate or move, resulting in effects such as heat generation. This type of radiation is commonly encountered in daily life and is generally not harmful at typical exposure levels.

Examples of non-ionizing radiation include:

- Radio waves
- Microwaves
- Infrared radiation
- Visible light
- Extremely low-frequency (ELF) electromagnetic fields

While non-ionizing radiation does not cause ionization, excessive or prolonged exposure to high-intensity sources (such as lasers or microwave ovens) can still cause localized heating or tissue damage.

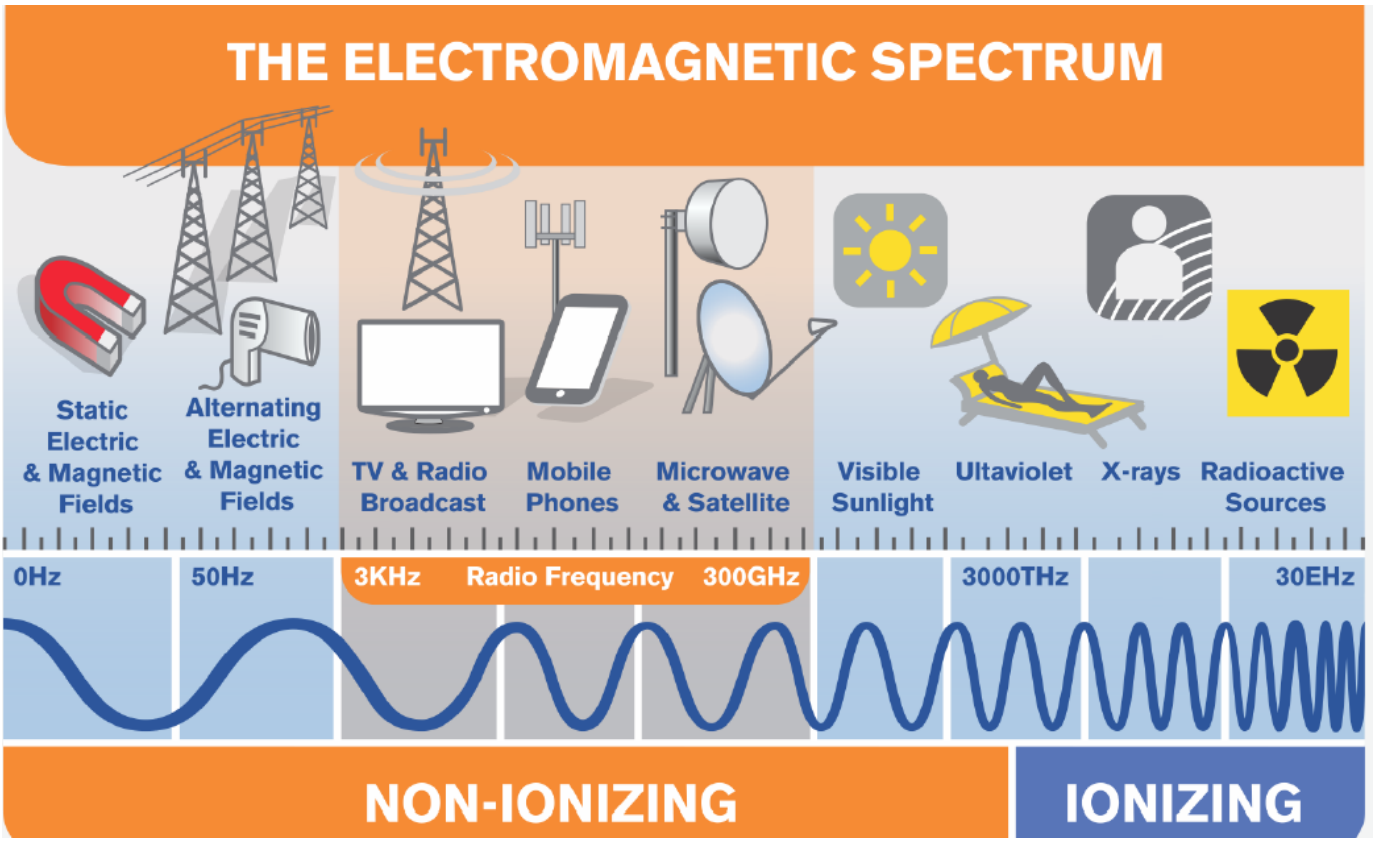
Ionizing Radiation

Ionizing radiation carries enough energy to remove tightly bound electrons from atoms, creating charged particles known as ions. This process can alter the chemical structure of molecules, including the DNA in human cells, which increases the risk of biological damage.

Sources of ionizing radiation include:

- Medical imaging devices (X-rays, CT scans)
- Cosmic radiation from space
- Radioactive elements such as uranium, radium, and cesium
- Nuclear reactors and weapons
- Fallout from nuclear explosions or accidents

Because of its ability to damage living tissue and DNA, ionizing radiation poses a significant health risk when exposure is unmonitored or uncontrolled. It is the primary concern in radiological emergencies and the focus of protective measures outlined in this annex.



INDICATORS OF A RADIOLOGICAL ATTACK/RELEASE

A radiological attack or release may involve the deliberate use of radioactive materials to inflict harm, create fear, and disrupt societal function. Such incidents may be carried out by individuals or organized groups, including terrorists, extremist networks, state-sponsored actors, or criminal organizations.

Recognizing potential indicators of a radiological incident is critical for first responders, emergency managers, and public health personnel. Early identification enables timely protective actions such as isolation, evacuation, medical intervention, and hazard containment. Public awareness also plays an essential role in early detection and reporting.

Operational Indicators of a Radiological Attack

- Discovery of suspicious containers, packages, or dispersal devices with warning placards or radiation symbols

- Use of conventional explosives in combination with radioactive materials (i.e., a dirty bomb)
- Detection of unexpected radiation by portable survey meters or radiation pagers
- Unusual patterns of illness or symptoms among victims with no visible injuries
- Reports of individuals placing or retrieving items from public areas, especially high-traffic locations

Environmental and Scene Clues

- Presence of powdered or granular materials without an obvious source
- Radiation symbols or labeling found on containers in inappropriate or unsecured locations
- Vehicles or containers abandoned in high-profile or symbolic areas
- Disturbed soil, residue, or materials suggesting placement of a dispersal device
- Unexplained animal deaths near the suspected area

Potential Health Symptoms of Radiation Exposure

Individuals exposed to significant levels of ionizing radiation may present with early-onset symptoms, including:

- Eye and skin irritation or burns
- Persistent nausea or vomiting
- Shortness of breath or choking sensations
- Muscle weakness or tremors
- Dizziness, disorientation, or loss of consciousness
- Seizures or neurological effects in extreme cases

These symptoms may appear hours or days after exposure, depending on dose and duration. Responders should treat all unexplained illnesses near a suspected radiological release as potential exposure until ruled out.

OTHER INDICATORS OF A RADIOLOGICAL ATTACK/RELEASE:

In addition to physical symptoms and operational clues, there are environmental, behavioral, and situational indicators that may suggest the presence of a radiological threat. Early recognition of these signs can help prevent additional exposure, enable rapid protective actions, and support a coordinated response.

Environmental and Physical Clues

- Unexplained areas of dead vegetation, discolored soil, or unusual water conditions
- Visible corrosion, residue, or burns on surfaces with no identifiable cause
- Discovery of suspicious or unfamiliar containers, especially those:

- Displaying radiation symbols, biohazard markings, or warning labels
- Leaking substances or emitting strange odors
- Abandoned in public places, high-traffic areas, or critical infrastructure sites

Health and Medical Clues

- Multiple individuals experiencing unexplained illness, including:
  - Difficulty breathing, nausea, dizziness, or vomiting
  - Skin burns, eye irritation, or unusual rashes
  - Fatigue, disorientation, or seizures without prior history
- Victims presenting with localized burns or injuries that appear inconsistent with thermal exposure but may align with ionizing radiation effects

Behavioral and Security Observations

- Suspicious or unauthorized individuals loitering near:
  - Medical facilities
  - Industrial sites using radiological materials
  - Research laboratories or educational institutions
  - Critical infrastructure such as water treatment plants, power substations, or nuclear facilities
- Tampering with access points, barriers, or surveillance equipment around sensitive sites
- Observation of unfamiliar vehicles, containers, or electronic equipment placed in unusual locations
- Reports of wildlife or domestic animals exhibiting erratic behavior or found dead in clusters without explanation

Technical Detection

- Any unexpected or elevated radiation readings on detection devices should be taken seriously
- Radiation pagers, survey meters, or fixed monitors reporting abnormal values must be reported immediately

If a radiological incident is suspected, call 911 immediately. Do not attempt to move, open, or investigate suspicious materials. Follow protective action guidance and await trained emergency response personnel.

POTENTIAL INDICATORS OF RADIOLOGICAL WARFARE AGENT POISONING

Radiological warfare agent poisoning may result from deliberate exposure to radioactive materials used in acts of terrorism or malicious intent. Although less common than chemical or biological threats, radiological agents can cause serious health impacts, particularly when exposure is not immediately recognized. Early identification of symptoms and environmental indicators is essential to initiate proper medical treatment and limit further exposure.

CLINICAL AND PHYSICAL INDICATORS

- Radiation sickness symptoms: Depending on the dose and duration of exposure, individuals may experience nausea, vomiting, fatigue, weakness, fever, dehydration, and hair loss. A decline in white blood cell count may occur, compromising the immune system. These symptoms often develop within hours to days of exposure.
- Unexplained burns or skin injuries: Exposure to certain radiological materials can cause skin damage resembling thermal burns. These injuries may appear without any apparent heat source or trauma.
- Symptoms of Acute Radiation Syndrome (ARS): In cases of high-dose exposure, symptoms may escalate to severe nausea, diarrhea, rapid weight loss, bleeding, and organ failure. Without medical intervention, ARS may result in death.

ENVIRONMENTAL AND DETECTION-BASED INDICATORS

- Radiation contamination: The Presence of radioactive material on clothing, personal items, or surfaces suggests a contaminated environment. Trained personnel should use proper detection equipment to confirm contamination.
- Elevated radiation levels: Readings from Geiger-Müller counters or other radiation detectors indicating abnormally high levels of radiation in people, objects, or locations may point to the use of radiological agents.
- Geographical anomalies: Unexpected increases in background radiation in normally low-radiation areas may suggest the introduction of radioactive substances.
- Suspicious equipment or containers: The discovery of unfamiliar or unmarked equipment emitting radiation, particularly in public areas, may indicate an intentional release.

RECOMMENDED ACTIONS

If radiological poisoning is suspected:

- Seek immediate medical attention.
- Contact emergency services by calling 911.
- Avoid further exposure and leave the affected area if safe to do so.
- Remove and isolate contaminated clothing and items.
- Follow all instructions from first responders, public health officials, and healthcare providers.

Radiation levels should be routinely monitored in high-risk or vulnerable locations. Any sudden or unexplained spike in readings should be treated as a potential radiological incident until proven otherwise.

NATURE OF THE RADIOLOGICAL HAZARD

Radiation is a hazardous form of energy that cannot be detected by human senses. It has no color, smell, taste, or sound. Therefore, the presence of harmful radiation can only be confirmed through specialized instrumentation. Understanding the nature and behavior of radiological hazards is critical to determining exposure pathways, estimating potential health effects, and identifying appropriate protective actions.

TYPES OF EXPOSURE

In the event of an atmospheric release from a radiological source, two primary exposure methods are possible:

- External Radiation Exposure: This occurs when radiation originates from a source outside the body. Often referred to as whole-body exposure, this type of exposure can affect all tissues simultaneously.
- Internal Radiation Exposure: This occurs when radioactive materials are inhaled, ingested, or enter the body through open wounds. Internal exposure may result in the deposition of radioactive particles in organs or tissues, leading to prolonged internal exposure.

PROJECTED DOSE AND EXPOSURE DETERMINANTS

The amount of radiation a person receives, known as the projected dose, depends on several key factors:

- Distance from the radiation source
- Duration of exposure
- Type and amount of radioactive material released
- Atmospheric conditions such as wind speed, direction, and air stability
- Physical and chemical properties of the isotopes involved

At commercial nuclear power plants, such as Surry Power Station (SPS), detailed assessments of these factors guide decisions on protective actions, including evacuation or shelter-in-place recommendations issued to the state and local authorities.

SOURCES OF BACKGROUND RADIATION

A small portion of background radiation comes from human activities. These include:

- Residual radioactive elements from historic nuclear weapons testing
- Accidents such as the Chernobyl disaster
- Routine emissions from nuclear reactors and industrial facilities
- Consumer products and medical uses of radioactive materials

These sources contribute to environmental radiation but typically result in only trace levels of exposure to the public.

EXPOSURE PATHWAYS

Radioactive materials released into the environment may affect individuals through two broad exposure pathways:

Plume Exposure Pathway:

- Involves exposure to radiation from the radioactive plume as it moves through the atmosphere. This can include whole-body exposure from gamma radiation and inhalation of airborne radioactive particles.
- Exposure duration may range from 30 minutes to several days, depending on the nature of the release and weather conditions.
- Evacuation is typically the most effective immediate protective action. Sheltering in place may be appropriate for special populations such as hospital patients or incarcerated individuals for whom evacuation poses additional risks.

Ingestion Exposure Pathway:

- Involves consuming contaminated food or water, particularly products like milk or leafy vegetables.
- Exposure may persist for days, weeks, or even months, depending on contamination levels and food distribution patterns.
- Protective actions may include environmental monitoring, restricting access to affected areas, placing dairy animals on stored feed and clean water, and implementing food and water advisories.

HEALTH EFFECTS OF RADIATION EXPOSURE

The health impacts of radiation exposure vary based on the dose and duration of exposure. In many emergency situations, public exposure levels may be so low that no noticeable health effects occur. However, high levels of exposure can result in both short-term and long-term consequences:

- Early Effects: These acute effects can occur within days or weeks following a high-dose exposure and may include nausea, vomiting, diarrhea, fatigue, loss of appetite, hair loss, temporary sterility, and observable biological changes such as chromosomal alterations.
- Delayed Effects: These may not appear until years after exposure and include:
    - Somatic effects such as increased cancer risk and reduced life expectancy
    - Genetic effects such as birth defects, prenatal mortality, or hereditary mutations that may be passed on to future generations

RESPONSE PHASES

A response to a radiological incident is typically organized into three operational phases: the early phase, intermediate phase, and late phase. Each phase is defined by specific operational conditions and decision-making requirements, and the phases may overlap depending on the nature and scale of the incident.

EARLY PHASE

The early phase begins at the onset of the incident and continues for hours to days. This period is characterized by the need to make immediate protective action decisions with limited or no confirmed field data. Radiological releases may still be in progress or imminent.

Key objectives of the early phase include:

- Preventing or minimizing the inhalation of radioactive gases or particulates from a plume
- Reducing external exposure through evacuation or sheltering
- Limiting the spread of contamination to people, animals, infrastructure, and the environment

Protective actions must be based on predictive modeling, historical data, and precautionary principles until more accurate exposure measurements are available.

INTERMEDIATE PHASE

The intermediate phase may begin within hours of the incident and could continue for weeks or months. This phase typically begins once the source of the radiological release has been stabilized or contained and when protective actions can be guided by environmental monitoring and exposure assessment data.

Key objectives of the intermediate phase include:

- Continuing to limit public exposure to deposited radioactive materials
- Controlling the spread of contamination
- Monitoring and limiting occupational exposures for responders and cleanup personnel
- Beginning preparations for environmental remediation and long-term recovery

This phase also includes addressing contaminated infrastructure, conducting health surveillance, and coordinating with environmental and public health agencies to determine ongoing protective actions.

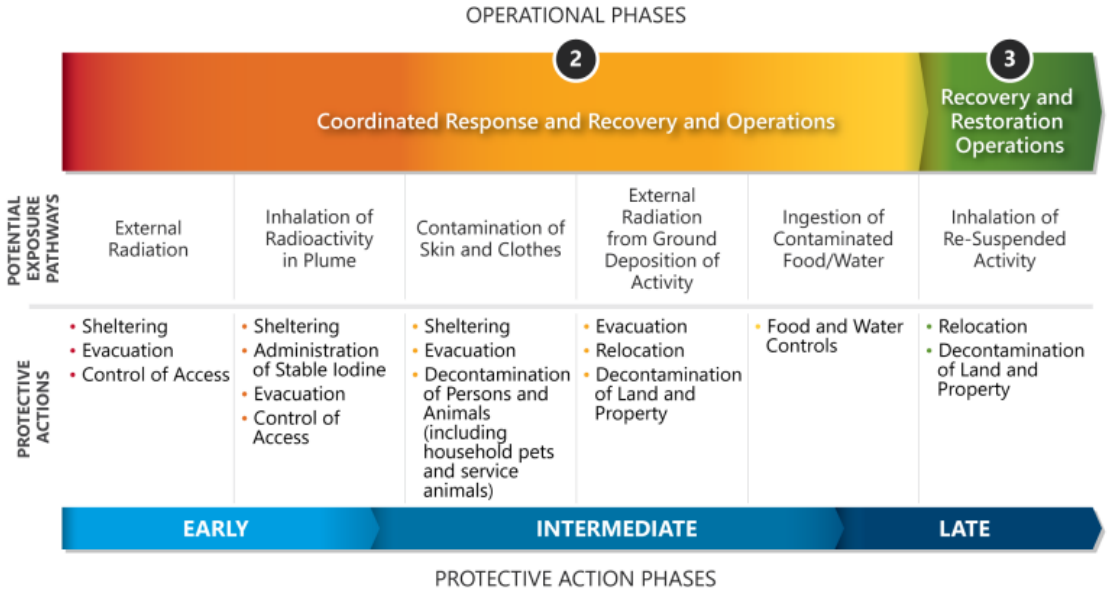
LATE PHASE

The late phase focuses on long-term recovery, environmental remediation, and community reoccupation. It overlaps with the intermediate phase as response efforts transition from emergency operations to recovery and restoration.

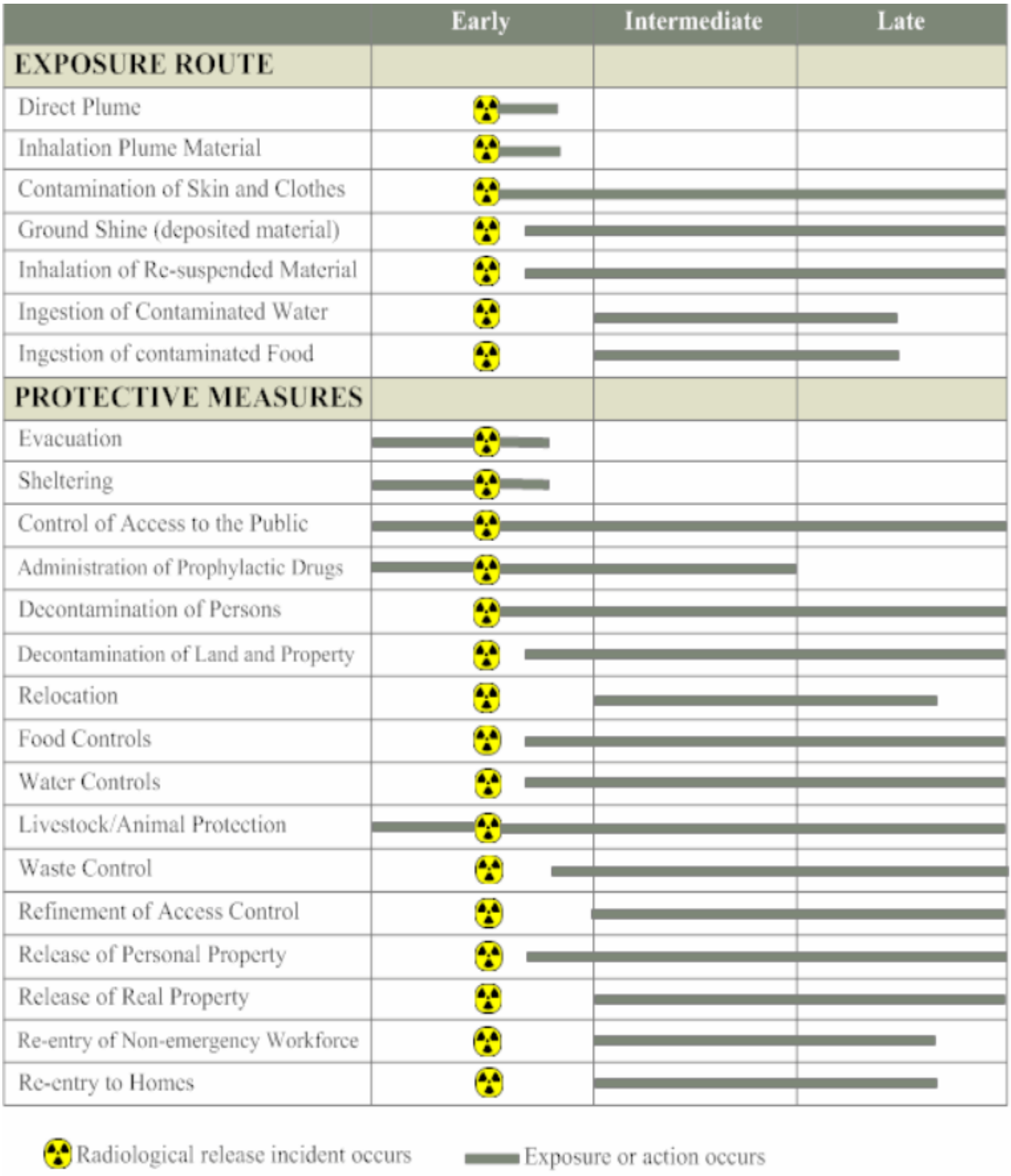
Key objectives of the late phase include:

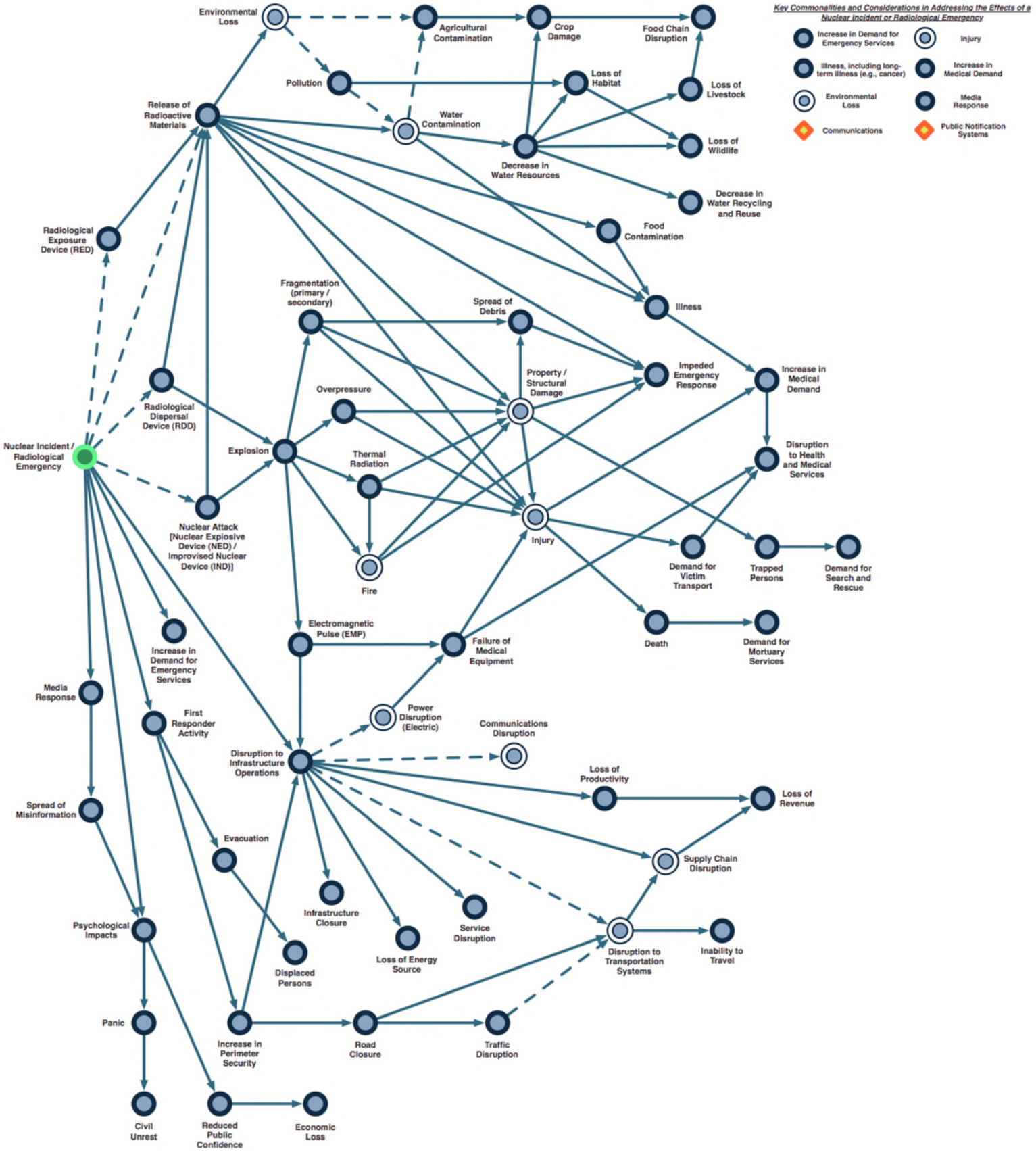
- Implementing decisions on decontamination and cleanup
- Reducing residual radiation levels in the environment to acceptable standards
- Restoring infrastructure and enabling long-term reentry and resettlement
- Supporting long-term public health monitoring and behavioral health services

This phase involves extensive coordination with environmental agencies, public works, utility providers, and federal partners to restore normalcy while ensuring continued public safety.



RELATIONSHIP BETWEEN EXPOSURE ROUTES, PROTECTIVE MEASURES, AND TIME FRAMES FOR EFFECTS




Key Commonalities and Considerations in Addressing the Effects of a Nuclear Incident or Radiological Emergency
Increase in Demand for Emergency Services
Injury
Illness, including long-term illness (e.g., cancer)
Increase in Medical Demand
Environmental Loss
Media Response
Communications
Public Notification Systems
Environmental Loss
Agricultural Contamination
Crop Damage
Food Chain Disruption
Pollution
Loss of Habitat
Loss of Livestock
Release of Radioactive Materials
Water Contamination
Loss of Wildlife
Decrease in Water Resources
Decrease in Water Recycling and Reuse
Radiological Exposure Device (RED)
Food Contamination
Fragmentation (primary / secondary)
Spread of Debris
Illness
Property / Structural Damage
Impeded Emergency Response
Increase in Medical Demand
Overpressure
Radiological Dispersal Device (RDD)
Nuclear Incident / Radiological Emergency
Explosion
Thermal Radiation
Disruption to Health and Medical Services
Nuclear Attack [Nuclear Explosive Device (NED) / Improvised Nuclear Device (IND)]
Injury
Demand for Victim Transport
Trapped Persons
Demand for Search and Rescue
Fire
Electromagnetic Pulse (EMP)
Death
Demand for Mortuary Services
Increase in Demand for Emergency Services
Failure of Medical Equipment
Media Response
First Responder Activity
Power Disruption (Electric)
Communications Disruption
Disruption to Infrastructure Operations
Loss of Productivity
Loss of Revenue
Spread of Misinformation
Evacuation
Supply Chain Disruption
Infrastructure Closure
Service Disruption
Psychological Impacts
Displaced Persons
Loss of Energy Source
Disruption to Transportation Systems
Inability to Travel
Panic
Increase in Perimeter Security
Road Closure
Traffic Disruption
Civil Unrest
Reduced Public Confidence
Economic Loss

COMMUNITY LIFELINES

When a radiological incident disrupts services to the point that survivors and property are severely affected, stabilizing the community's lifelines becomes the highest priority. Community lifelines provide a framework for responders to use in assessing disruption to critical lifesaving and life-sustaining services. Community lifelines enable the continuous operation of critical government and business functions and are essential to human health and safety and economic security. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Lifelines are the integrated network of assets, services, and capabilities that are used day to day to support the recurring needs of the community. When a lifeline is disrupted, decisive intervention (such as rapid service reestablishment or employment of contingency response solutions) is required to stabilize the situation. For a radiological incident, the lifeline concept may be applied to prioritize the delivery of critical services that alleviate immediate threats to life and property.

Assessing lifeline status allows for more efficient decision-making during the response by gathering critical information associated with the following response activities:

- Determine the severity of the impact on critical infrastructure.
- Identify limiting factors and gaps to address those impacts.
- Quickly prioritize solutions to alleviate threats to life and property.
- Provide stabilization to survivors by rapidly reestablishing critical services.

Stabilization may occur through the employment of a temporary solution to restore a lifeline until a permanent solution can be established. When a lifeline has been restored, follow-on events may lead to lifeline degradation. Therefore, lifelines must be continually resourced, and their condition monitored. Depending on the severity of the impact on each lifeline, some lifelines may be restored earlier than others.

Once situational awareness is attained, leadership determines the status of the lifelines within the affected area. The status indicates the level of degradation of lifeline services and provides a snapshot of an operational period. Lifeline statuses should be determined collaboratively and continually as circumstances evolve throughout an incident. FEMA's reporting products use four colors (grey, red, yellow, and green) for operational reporting on lifelines.

Status	Description
Unknown: Grey	Disruption and impacts to lifeline services are unknown
Unstable: Red	Lifeline services disrupted, with no solution identified or in progress
Stabilizing: Yellow	Lifeline services disrupted but solution in progress with estimated time to stabilization identified
Stable: Green	Lifeline services stabilized, reestablished, or not affected

The Hazardous Materials (HAZMAT) lifeline monitors the status of hazardous materials and facilities, pollutants, and contaminants during an incident. A nuclear/radiological incident may disrupt multiple lifelines. For example, if an accidental nuclear release occurs at a power plant, then the response must stabilize both the Hazardous Material lifeline and the Energy lifeline. If radiological release causes more people to seek medical care than local hospitals can handle, then the response must stabilize both the Hazardous Materials lifeline and the Health and Medical lifeline.

The HAZMAT lifeline has two components: (1) infrastructure and (2) contaminants and exposure.

For Norfolk to be fully stabilized after a nuclear/radiological incident, all lifelines must be stable, including HAZMAT. Stabilization targets are developed for all components and subcomponents of every lifeline early in the response process, typically immediately following the completion of a component assessment. Initial stabilization targets should be revisited and refined periodically throughout the response. Stabilization targets drive key leadership decisions and prioritization of response resources and actions, including the development of strategies, operational priorities, and objectives. Due to the unique and complex nature of nuclear/radiological incidents, other stabilization targets will need to be identified, in addition to the Hazardous Materials lifeline stabilization targets, as multiple community lifelines will likely be impacted. This may include the Food, Water, Shelter lifeline, Health and Medical lifeline, and Safety and Security lifeline, among others.

When stabilization of community lifelines is achieved, the focus of the mission shifts to achieving recovery outcomes.

ROLES AND RESPONSIBILITIES

Individuals, Homeowners, and Business Owners

Members of the public play a critical role in supporting community-wide safety and emergency response during a radiological incident. While first responders manage on-scene operations, residents and business owners are responsible for taking protective actions to reduce their own risk and support broader public health and safety goals.

Key responsibilities include:

- Stay Informed
    - Register for Norfolk Alert to receive timely emergency notifications.
    - Follow official guidance from the Norfolk Emergency Operations Center (EOC) and trusted public safety sources.
- Be Prepared to "Get Inside, Stay Inside, and Stay Tuned"
    - In a radiological emergency, sheltering indoors may be the safest immediate action.
    - Monitor local news, Norfolk Alert updates, and official social media for changing guidance.
    - For more information, visit the CDC's radiation sheltering guidance: https://emergency.cdc.gov/radiation/evacuation.asp
- Maintain an Emergency “Go-Bag”
    - Include essentials such as water, non-perishable food, a flashlight, medications, identification, important documents, and a portable radio.
- Understand Shelter-in-Place Protocols
    - Shelter-in-place requires remaining indoors, closing windows and doors, turning off ventilation systems if advised, and seeking an interior room with as few openings as possible.
- Manage Emergency Communications Expectations
    - During a large-scale incident, 911 call centers may be overwhelmed. Only call 911 for immediate life-threatening emergencies.
- Follow Evacuation Instructions Promptly
    - Evacuation orders will be issued by the on-scene incident commander or the Norfolk EOC and communicated through Wireless Emergency Alerts, Norfolk Alert, and other city platforms.
- Expect Evolving Information
    - Guidance and protective actions may change frequently as officials learn more about the situation. Remain patient, flexible, and attentive to new updates.
- Be Prepared for Possible Decontamination

- If contamination is suspected, first responders may initiate decontamination protocols, which could include removal of outer clothing. Privacy garments or basic coverings will be provided when needed.

EMERGENCY SUPPORT FUNCTION 1: TRANSPORTATION

Primary Agency: Norfolk Police Department (Traffic Management Unit)

Support Agencies: Norfolk Public Works, Norfolk Department of Transit, Norfolk Emergency Management, Norfolk Fire-Rescue, Hampton Roads Transit (HRT), Virginia Department of Transportation (VDOT), Virginia State Police

KEY RESPONSIBILITIES

Norfolk Police Department (Traffic Management Unit)

- Identify and coordinate evacuation routes in conjunction with incident command and the Emergency Operations Center (EOC).
- Implement road closures and perimeter control in coordination with Norfolk Public Works Smart Traffic.
- Ensure secure corridors for emergency responder access and movement of critical resources.

Norfolk Public Works (Smart Traffic Division)

- Coordinate with Norfolk Police on the activation of road closures, rerouting, and adaptive signal control.
- Deploy barriers, signage, and dynamic message boards as needed to support evacuation and restrict access to contaminated areas.
- Assess and report impacts to transportation infrastructure affected by the incident.

Norfolk Department of Transit

- Coordinate with Norfolk Police and Public Works on changes to public transit routes due to radiological impacts or evacuation operations.
- Provide assets to support the movement of responders or the evacuation of special needs populations, if required.
- Communicate service adjustments to the Joint Information Center (JIC) for public messaging.

Norfolk Emergency Management

- Coordinate multi-agency transportation efforts from the EOC.
- Track and manage transportation resource requests and mission assignments.

- Integrate transportation updates into Situation Reports (SitReps) and Operational Period Briefings.

Norfolk Fire-Rescue

- Advise on transport corridor safety for responder movement and medical transport.
- Support planning for contaminated patient movement routes in coordination with EMS and hospitals.

Hampton Roads Transit (HRT)

- Provide mass transit support for evacuation operations, if directed.
- Coordinate service suspensions, route changes, or alternate staging with the EOC.
- Relay public-facing service changes to the JIC for dissemination.
- Virginia Department of Transportation (VDOT)
- Support highway detours, signage, and lane closures on state-maintained roads.
- Provide traffic engineering expertise and coordinate with Norfolk Smart Traffic for impacted corridors.

Virginia State Police

- Assist with highway evacuation, traffic control, and enforcement of road closures.
- Coordinate with Norfolk Police for enforcement actions related to hazardous material movement and access restrictions.

Additional Considerations

- Evacuation planning should prioritize primary and alternate routes based on wind direction, plume modeling, and contamination zones.
- All transportation restrictions and service changes must be communicated to the Joint Information Center for timely public messaging.
- Staging areas for emergency vehicles and personnel should be pre-identified and secured in coordination with Norfolk Public Works and the Police Department.
- Traffic data and infrastructure impacts should be continuously monitored and integrated into EOC briefings and updates.

EMERGENCY SUPPORT FUNCTION 2: COMMUNICATIONS

Primary Agency: Norfolk Department of Emergency Communications (911 Center)

Support Agencies: Norfolk Emergency Management, Norfolk Information Technology, Norfolk Police Department, Norfolk Fire-Rescue, Norfolk Public Health, Virginia State Police, Virginia Fusion Center

KEY RESPONSIBILITIES

Norfolk Department of Emergency Communications (911 Center)

- Serve as the primary public safety answering point (PSAP) for emergency calls related to the incident.
- When feasible, gather and relay critical information from callers, including visible signs, suspicious packages, and any mention of suspected radioactive material.
- Promptly notify the Norfolk Emergency Management Division and appropriate department leadership when a radiological incident is suspected or confirmed.
- Ensure timely dispatch of public safety resources and communicate initial scene information to responding units, including any radiological indicators or symptoms reported.
- Coordinate radio communications across agencies using interoperable systems to support unified response efforts.

Norfolk Emergency Management

- Activate and manage the Emergency Operations Center (EOC) and ensure redundant communications systems are operational.
- Facilitate situational awareness by integrating radio, phone, and data communications into the EOC's common operating picture.
- Ensure communication with regional, state, and federal partners is maintained throughout the incident.

Norfolk Information Technology

- Maintain the functionality of communications infrastructure, including citywide radio systems, data networks, and emergency communications systems.
- Provide technical support to the EOC and response agencies to ensure secure and uninterrupted communications.
- Support integration of data from monitoring and detection equipment as needed for situational analysis.

Norfolk Police Department / Norfolk Fire-Rescue

- Maintain operational communications with field units and coordinate with the EOC for resource requests and situation updates.

- Support radio discipline and interoperability across jurisdictions during multi-agency operations.

Virginia State Police / Virginia Fusion Center

- Share threat intelligence and situational updates related to suspected terrorism or intentional use of radiological materials.
- Facilitate secure communication with state-level intelligence and coordination centers.

Additional Considerations

- All communication systems must be tested and confirmed operational at the onset of the incident, including backup systems.
- Special care must be taken to ensure secure, accurate, and timely sharing of information to avoid public panic and misinformation.
- First responder units should be equipped with interoperable radios and trained in proper usage during large-scale multi-agency events.
- Communications updates should be included in each Operational Period Briefing and integrated into Joint Information Center messaging.

EMERGENCY SUPPORT FUNCTION 3: PUBLIC WORKS, UTILITIES & ENGINEERING

Primary Agency: Norfolk Public Works

Support Agencies: Norfolk Utilities, Norfolk Emergency Management, Norfolk Fire-Rescue, Norfolk Police Department, Norfolk Information Technology, Virginia Department of Environmental Quality (DEQ), U.S. Army Corps of Engineers (USACE), Dominion Energy, HRSD (Hampton Roads Sanitation District)

KEY RESPONSIBILITIES

Norfolk Public Works

- Dispatch heavy equipment to assist with debris clearance operations upon request from Incident Command or the Emergency Operations Center (EOC).
- Coordinate with law enforcement and environmental officials to ensure safe handling of radiologically contaminated debris.
- Provide engineering support to assess structural integrity of public infrastructure and facilities potentially affected by radiological contamination or blast effects.
- Deploy signage, barricades, and barriers to secure access to impacted areas.

Norfolk Utilities

- Monitor and assess water and wastewater systems for contamination.
- Support isolation of affected utility lines or service areas if radiological materials threaten infrastructure integrity.
- Coordinate with Public Works and HRSD on potential protective actions related to water quality.

Norfolk Emergency Management

- Coordinate multi-agency debris clearance and infrastructure response planning.
- Integrate engineering and utility updates into EOC briefings, SitReps, and planning documents.
- Ensure alignment with the Norfolk Debris Management Plan and facilitate coordination with regional, state, and federal partners.

Norfolk Fire-Rescue / Norfolk Police Department

- Assist in securing debris fields as potential crime scenes in coordination with federal law enforcement.
- Provide safety oversight for personnel operating in areas where radiological contamination may be present.

Norfolk Information Technology

- Support the restoration of critical public works communications systems, including SCADA and control systems.
- Provide GIS and mapping tools to support infrastructure assessments and utility outage tracking.

Virginia Department of Environmental Quality (DEQ)

- Provide technical guidance on hazardous materials and radiological debris disposal.
- Coordinate with Norfolk and federal partners on permitting and oversight of cleanup operations.

U.S. Army Corps of Engineers (USACE)

- Provide engineering, debris removal, and damage assessment expertise upon request through federal assistance channels.
- Support large-scale infrastructure restoration if a federal disaster declaration is issued.

Dominion Energy

- Assess and repair damage to electrical infrastructure.
- Support safe utility shutoff or rerouting as needed in contaminated areas.

Hampton Roads Sanitation District (HRSD)

- Monitor wastewater treatment facilities and coordinate with Norfolk Utilities on contamination risks.
- Implement protective actions to ensure safe handling and treatment of potentially contaminated water.

Additional Considerations

- Radiological incidents may generate hazardous or contaminated debris that requires specialized collection, transport, and disposal procedures.
- Coordination with public health, law enforcement, and environmental agencies is critical before beginning any clearance or demolition operations.
- All debris operations must align with the Norfolk Debris Management Plan (see page 32) and should be reviewed in conjunction with applicable federal guidelines on radiological waste handling.
- Public Works and partner agencies must be prepared to work within restricted zones and under crime scene constraints where evidence preservation is a priority.

EMERGENCY SUPPORT FUNCTION 4: FIREFIGHTING

Primary Agency: Norfolk Fire-Rescue (NF-R)

Support Agencies: Norfolk Emergency Management, Norfolk Department of Public Health (NDPH), Norfolk Police Department, Norfolk Department of Public Works, Norfolk Department of Human Services, Virginia Department of Emergency Management (VDEM), Virginia Department of Health (VDH), U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA)

KEY RESPONSIBILITIES

Norfolk Fire-Rescue (NF-R)

- Serve as the lead agency and assume Incident Command at any scene involving radiological materials until Unified Command is established.
- Coordinate with the Norfolk Department of Public Health (NDPH), VDEM Radiological Emergency Response Teams, and other specialized support agencies as needed.

- Identify existing or potential health and safety hazards for all response personnel during life-saving and operational activities.
- Provide on-scene emergency medical care and patient transport, including triage of potentially contaminated individuals.
- Extinguish fires resulting from radiological explosions or secondary ignition sources.
- Assist with incident investigations in coordination with law enforcement and federal authorities.
- Develop and maintain the ICS-205 Communications Plan to ensure interoperability among all responding agencies.
- Establish and operate decontamination corridors, including provisions for individuals with functional needs and assistive devices such as wheelchairs, walkers, and mobility aids.
- Ensure equipment decontamination procedures are in place and consistently followed to prevent secondary exposure or contamination.

Norfolk Emergency Management

- Provide logistical support, coordinate mutual aid resources, and maintain situational awareness through the Emergency Operations Center (EOC).
- Ensure communication with state and federal partners supporting firefighting and hazardous materials operations.

Norfolk Department of Public Health (NDPH)

- Support exposure monitoring and assessment of contaminated individuals.
- Advise on responder protection protocols and public health safety recommendations.

Norfolk Police Department

- Secure the scene and assist with evidence protection during fire investigations.
- Support perimeter control and access for fire and rescue operations.

Norfolk Public Works

- Support the setup of decontamination infrastructure, water supply access, and hazardous waste containment where needed.
- Provide debris clearance or heavy equipment support for fire suppression activities.

Virginia Department of Emergency Management (VDEM)

- Deploy radiological technical specialists to assist Norfolk Fire-Rescue and public safety partners.
- Coordinate federal firefighting support if required under state or national disaster declarations.

Virginia Department of Health (VDH)

- Provide radiological health expertise and guidance on population-level protective actions.
- Assist with the evaluation of contamination levels and responder safety.

U.S. Department of Energy (DOE) / Environmental Protection Agency (EPA)

- Offer federal radiological monitoring assets and technical support.
- Assist with fire scene assessments and post-incident environmental sampling if contamination is suspected.

Additional Considerations

- Norfolk Fire-Rescue must ensure decontamination units are accessible and inclusive, with appropriate planning for individuals with disabilities or access and functional needs.
- All contaminated materials, including personal mobility devices, must be handled, decontaminated, or isolated according to federal and state guidance.
- First responder safety must be a continuous priority, with emphasis on PPE compliance, real-time monitoring, and rest-rotation planning.
- Fire operations should be fully integrated into the Unified Command structure and coordinated with hazardous materials, EMS, and law enforcement functions.

EMERGENCY SUPPORT FUNCTION 5: INFORMATION AND PLANNING

Primary Agency: Norfolk Emergency Management

Support Agencies: Norfolk Department of Information Technology, Norfolk Department of Public Health, Norfolk Fire-Rescue, Norfolk Police Department, Norfolk Public Schools, Norfolk Public Works, Virginia Department of Emergency Management (VDEM), Federal Emergency Management Agency (FEMA), Joint Task Force – Civil Support (JTF-CS), Hampton Roads Incident Management Team (HRIMT)

KEY RESPONSIBILITIES

Norfolk Emergency Management

- Recommend a local emergency declaration when incident conditions warrant.
- Assist in the dissemination of evacuation orders at the request of the on-scene Incident Commander (IC) or Unified Command (UC).
- Monitor National Weather Service (NWS) forecasts for implications to plume modeling, shelter planning, and responder safety.

- Activate and manage the Emergency Operations Center (EOC) in support of on-scene operations.
- Notify Team Norfolk stakeholders and schedule regular EOC briefings to ensure situational awareness and coordinated response.
- Facilitate collaboration and information sharing with Team Norfolk partners, including Norfolk Public Schools, Naval Station Norfolk (NSN), Norfolk International Terminals (NIT), colleges and universities, and shipyard facilities.
- Maintain real-time communications with the Virginia Emergency Operations Center (VEOC) and submit Situation Reports (SitReps) and resource requests as needed.

Joint Task Force – Civil Support (JTF-CS)

- Provide specialized support between 48 to 96 hours post-incident and beyond, particularly in areas requiring intensive consequence management.
- Capabilities include mass casualty medical care, medical staff augmentation, and mass fatality or mortuary support operations.
- JTF-CS may be requested through VDEM for large-scale or complex incidents involving significant radiological impacts.

FEMA Rapid Needs Assessment (RNA) Team

- Conduct rapid, on-site assessments to identify immediate and projected resource needs following a declared disaster.
- Team includes representatives from FEMA, the State, and ESFs 3, 6, 8, 9, and 10.
- Supported by Mobile Emergency Response Support (MERS), which provides logistics, communications, and reporting capabilities for up to 72 hours.
- The RNA Team Leader coordinates directly with the Emergency Response Team Advanced (ERT-A) or FEMA Operations Center.

Hampton Roads Incident Management Team (HRIMT)

- May be deployed to assist Norfolk Emergency Management with incident coordination, planning, and documentation support.
- Assists with developing and updating the Incident Action Plan (IAP), SitReps, and ICS forms to ensure consistent information management.

Federal Emergency Management Agency (FEMA)

- May establish a Joint Field Office (JFO) to coordinate federal recovery operations in the short-term and intermediate phases (see Short-Term – Intermediate Recovery Plan).

- Responsible for managing CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) funds to support site remediation and cleanup if no responsible party is identified.

Additional Considerations

- Planning staff should maintain a common operating picture by integrating GIS tools, plume modeling, and radiation detection data into EOC briefings.
- Ensure regular updates are incorporated into the Incident Action Plan (IAP) and shared with all ESFs and partner agencies.
- Coordinate information flow between the on-scene command, the EOC, and external agencies to prevent gaps or duplications.
- Anticipate prolonged planning needs, including transition to recovery operations and public health monitoring.

EMERGENCY SUPPORT FUNCTION 6: MASS CARE, EMERGENCY ASSISTANCE, TEMPORARY HOUSING, AND HUMAN SERVICES

Primary Agencies: Norfolk Department of Human Services (HS), Norfolk Community Services Board (CSB)

Support Agencies: Norfolk Emergency Management, Norfolk Department of Public Health, Norfolk Public Schools, Norfolk Animal Care and Adoption Center (NACAC), American Red Cross, Voluntary Organizations Active in Disaster (VOAD), Norfolk Department of Transit, Virginia Department of Social Services (VDSS), Virginia Department of Behavioral Health and Developmental Services (DBHDS)

KEY RESPONSIBILITIES

Norfolk Department of Human Services / Community Services Board (CSB)

- Be prepared to activate emergency shelters for displaced individuals and household pets from the evacuation zone.
- Work with the Emergency Operations Center (EOC) to identify vulnerable individuals or client populations potentially affected by the incident.
- Upon request from the EOC, deploy the Shelter Tiger Team to establish and manage shelter operations until state or volunteer support resources arrive.
- Coordinate dependent care for children whose parents or guardians have become contaminated, hospitalized, or otherwise isolated due to the incident.

- Coordinate individual assistance for affected victims, including referrals, case management, and social support services.
- Deploy Crisis Intervention Teams, if appropriate, to assist with psychological first aid for evacuees, responders, or shelter residents.
- Coordinate with ESF 17 (Red Cross) to support the People Finder program and Family Reunification Services.
- Ensure resources are available to meet the clothing and hygiene needs of individuals who have been through decontamination, which may include disrobing and showering.
- Maintain continuity of essential day-to-day services for existing Human Services and CSB clients. As needed, coordinate staffing adjustments to support Family Reception Center (FRC) or Family Assistance Center (FAC) operations.

American Red Cross / Voluntary Organizations Active in Disaster (VOAD)

- Assist with spiritual care, emotional support, and grief counseling for survivors and responders.
- Coordinate with CSB to establish the People Finder program and Reunification and Family Services, especially for displaced or unaccompanied minors, elderly individuals, or those with access and functional needs.

Norfolk Animal Care and Adoption Center (NACAC)

- Support co-location of animal sheltering services with human shelters when feasible.
- Coordinate animal decontamination and temporary care services.

Norfolk Public Schools

- Assist in identifying and opening school facilities that may be used as temporary shelter locations, in coordination with the EOC and Human Services.

Additional Considerations

- Shelter planning must account for decontamination protocols, privacy needs, mobility aids, access and functional needs, and appropriate post-decontamination supplies.
- Emergency shelters must maintain the ability to segregate contaminated individuals pending decontamination and medical assessment.
- Emotional and psychological support must be prioritized early and sustained over the duration of shelter operations.
- Shelters must be supplied with PPE, radiation protection guidance, and regular briefings to support safety of shelter staff and residents.
- Coordination with VOAD partners and state agencies will be essential for resource resupply, volunteer management, and long-term housing referrals.

EMERGENCY SUPPORT FUNCTION 7: LOGISTICS

Primary Agency: Norfolk Emergency Management

Support Agencies: Norfolk Public Works, Norfolk Fire-Rescue, Norfolk Department of General Services, Norfolk Police Department, Virginia Department of Emergency Management (VDEM), General Services Administration (GSA), U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE)

KEY RESPONSIBILITIES

Norfolk Emergency Management

- Provide logistical coordination and resource support to on-scene Incident Command (IC) and Unified Command (UC) as needed.
- Collaborate with the Federal On-Scene Coordinator (FOSC) and state logistics officials to integrate federal assets and support.
- Track incoming resource requests and ensure rapid fulfillment through local, regional, state, or federal channels.
- Coordinate with the Emergency Operations Center (EOC) to stage, distribute, and account for supplies, equipment, and personnel.
- Monitor the availability and resupply of mission-critical resources, including radiation detection equipment, PPE, decontamination kits, and responder sustenance.

Norfolk Public Works / General Services

- Provide operational support and staging areas for incoming assets, including space for equipment, materials, and vehicles.
- Deploy and maintain wheel wash stations for vehicles and equipment involved in soil removal or operations in contaminated zones to prevent cross-contamination.
- Support logistics movement through transportation coordination, site access support, and fuel distribution as needed.

Norfolk Fire-Rescue

- Coordinate specialized resource needs for hazmat and radiological response teams, including mutual aid deployments.
- Assist with the identification and prioritization of critical life-saving equipment and supplies.

Norfolk Police Department

- Provide security for staging areas and supply hubs.

- Coordinate escorts for critical supplies and equipment entering or exiting contaminated zones.

Virginia Department of Emergency Management (VDEM)

- Support Norfolk's logistics operations by facilitating state resource requests and accessing state contracts and cache inventories.
- Coordinate with FEMA and other federal partners for additional support as needed.

General Services Administration (GSA)

- Provide federal procurement and contract support for critical supplies and logistics infrastructure.
- Assist with deployment of mobile command assets, staging equipment, or federal contractor support.
- U.S. Environmental Protection Agency (EPA) / U.S. Department of Energy (DOE)
- Assist in the identification, transport, and disposal of contaminated materials and hazardous waste.
- Ensure compliance with radiological handling protocols and safety standards for all material removal and transport operations.

Additional Considerations

- Any equipment used to remove or transport contaminated soil or debris must pass through wheel wash stations to prevent the spread of radioactive contamination beyond controlled zones.
- Staging areas should be selected and prepared with access to utilities, security, decontamination support, and transportation routes.
- All logistics movements should be documented and tracked within the EOC logistics section and incorporated into the Incident Action Plan (IAP).
- Early coordination with state and federal logistics units will expedite the deployment of specialized radiological response equipment and personnel.

EMERGENCY SUPPORT FUNCTION 8: PUBLIC HEALTH AND MEDICAL SERVICES

Primary Agencies: Norfolk Department of Public Health (NDPH), Norfolk Emergency Management

Support Agencies: Area Hospitals, Eastern Virginia Healthcare Coalition (EVHC), Metropolitan Medical Response System Team (MMRST), Medical Reserve Corps, Office of the Chief Medical Examiner (OCME), Operation Blessing, Joint Task Force – Civil Support (JTF-CS), Virginia Department of Health (VDH), U.S. Department of Health and Human Services (HHS), National Disaster Medical System (NDMS)

KEY RESPONSIBILITIES

Hospitals

- Implement contamination control protocols and establish on-site decontamination units to receive exposed or potentially contaminated patients.
- Provide emergency and acute care, as well as ancillary medical services to radiological exposure victims.
- Activate internal hospital incident command centers and identify available inpatient units and surge capacity.
- Update bed status, resource availability, and operational status in the Virginia Healthcare Alerting and Status System (VHASS).
- Coordinate patient movement, needs, and hospital status with the Regional Hospital Coordination Center (RHCC).
- Support law enforcement and the Office of the Chief Medical Examiner (OCME) by facilitating patient tracking and status updates, as needed.

Metropolitan Medical Response System Team (MMRST)

- Provide staffing support and PPE to healthcare or responder operations upon request from the Norfolk EOC.
- Support responder rehabilitation, including hydration, cooling, and rest stations.

Norfolk Department of Public Health (NDPH)

- Support the Joint Information Center (JIC) in delivering clear messaging about health risks, protective actions, and public reassurance regarding low-level exposures.
- Provide technical guidance and continuous evaluation of the radiological situation in collaboration with Norfolk Fire-Rescue and Norfolk Emergency Management.
- Maintain coordination with the Eastern Virginia Healthcare Coalition (EVHC) and monitor the status of hospitals, long-term care facilities, and adult care providers.
- Ensure continuity of care through closed Points of Dispensing (PODs) for at-risk populations, including medication distribution.
- Use the Department of Health and Human Services (DHHS) emPOWER map tool (https://empowermap.hhs.gov) to identify vulnerable individuals reliant on power-dependent medical devices or dialysis.

- During non-emergency periods, data is aggregated by ZIP code.
- During emergencies, detailed information is available upon declaration or anticipated disaster conditions.
- Data has an estimated 95% + accuracy rate and requires strict information handling protocols.

Medical Reserve Corps (MRC)

- Upon EOC request, contact individuals identified through the emPOWER tool to provide status updates, assess resource needs, and deliver follow-up support after the incident.
- May assist in PODs, shelters, or community outreach operations depending on the scale of the emergency.

Office of the Chief Medical Examiner (OCME)

- Assume jurisdiction over all fatalities per Code of Virginia §§ 32.1-277 to 32.1-288.
- Coordinate with Department of Defense Mortuary Affairs when decedents include military personnel.
- Provide guidance on radiological handling of remains and mass fatality management.
- Eastern Virginia Healthcare Coalition – Regional Hospital Coordination Center (RHCC)
- Serve as the hub for communication between NDPH, hospitals, long-term care facilities, and outpatient providers.
- Coordinate resource distribution and hospital surge planning, including rerouting patients to unaffected facilities.

Joint Task Force – Civil Support (JTF-CS)

- Support mass casualty medical care, including augmentation of medical staff, and assist with mass fatality management and mortuary affairs operations.
- JTF-CS capabilities may be requested through the Virginia Emergency Operations Center (VEOC).

Operation Blessing

- May provide refrigeration units for medical supplies or offer credentialed medical volunteers in support of response or sheltering operations.

Additional Considerations

- Public health messaging must address low-dose radiation exposure concerns, which may drive high volumes of patients with no clinical symptoms.

- Decontamination procedures must be established for ambulatory and non-ambulatory patients, and plans must accommodate patients with disabilities or mobility aids.
- Healthcare facilities located within contaminated zones should coordinate evacuation or shelter-in-place decisions with VDH and the Norfolk EOC.
- If local surge capacity is exceeded, consider Defense Support to Civil Authorities (DSCA) and request support from NDMS through VEOC and HHS/ASPR.
- Hospitals, nursing homes, and residential healthcare facilities with sufficient internal air filtration systems may not need to evacuate if air quality can be controlled.

EMERGENCY SUPPORT FUNCTION 9: SEARCH & RESCUE

Primary Agency: Norfolk Fire-Rescue

Support Agencies: Norfolk Police Department, Norfolk Emergency Management, FEMA Urban Search and Rescue (USAR), Virginia Department of Emergency Management (VDEM), U.S. Department of Energy (DOE), Environmental Protection Agency (EPA)

KEY RESPONSIBILITIES

Norfolk Fire-Rescue

- Serve as the lead agency for search and rescue (SAR) operations within the impacted area.
- Locate and extricate trapped or incapacitated victims, including those in contaminated zones or structural collapse environments.
- Coordinate with Norfolk Police to secure SAR operational areas and provide escort support when needed.
- Ensure SAR teams operate with appropriate radiological protective equipment and within safe exposure limits.
- Assist in identifying and marking buildings and structures that are unsafe for entry due to blast damage or contamination.

Norfolk Emergency Management

- Coordinate mutual aid and request federal or state SAR resources if local capabilities are exceeded.
- Maintain communication with VDEM and FEMA regarding the availability and deployment of specialized SAR teams.
- FEMA Urban Search and Rescue (USAR) Task Force

- Upon request, FEMA USAR teams may be deployed to support complex or large-scale search and rescue operations.
- Provide specialized technical capabilities including confined space rescue, structural collapse response, and hazardous materials search and detection.

Virginia Department of Emergency Management (VDEM)

- Facilitate coordination and activation of state SAR assets.
- Ensure federal SAR resources are integrated into the local ICS structure when deployed.

U.S. Department of Energy / Environmental Protection Agency (EPA)

- Provide technical support to ensure search operations are conducted safely in radiologically contaminated environments.
- Assist in environmental monitoring and exposure control for SAR personnel.

Additional Considerations

- All search and rescue personnel must be monitored for radiation exposure and undergo appropriate decontamination protocols after operating in contaminated areas.
- Rescue operations must be coordinated closely with fire suppression, hazardous materials, and medical triage teams.
- SAR teams must remain alert for signs of secondary hazards, including compromised structures, hazardous materials, or explosive devices.
- All victims rescued from a suspected radiological zone should be routed through decontamination corridors prior to medical evaluation or transport.

EMERGENCY SUPPORT FUNCTION 10: OIL AND HAZARDOUS MATERIAL RESPONSE

Primary Agency: Norfolk Fire-Rescue

Support Agencies: Norfolk Emergency Management, Norfolk Police Department, Virginia Department of Emergency Management (VDEM), Virginia Army National Guard CERFP, U.S. Environmental Protection Agency (EPA), Joint Task Force – Civil Support (JTF-CS), Domestic Nuclear Detection Office (DNDO), Southside Regional Hazmat Team, Regional Bomb Squad/EOD Teams, Tidewater Regional Technical Rescue Team (TRTRT)

KEY RESPONSIBILITIES

Norfolk Fire-Rescue

- Deploy Fire Marshal's Office personnel and activate the Norfolk Bomb Squad as the situation dictates.

- Coordinate with the Federal On-Scene Coordinator (FOSC) when federal assets are involved.
- Conduct on-scene decontamination for exposed individuals, including the public, responders, and potentially contaminated patients.
- Perform sweep operations to detect and clear secondary devices in and around the incident site.
- Treat homes, businesses, and facilities located within the contaminated zone for radiological exposure and conduct initial environmental hazard assessments.
- In coordination with the Logistics Section, initiate contracts for specialized facility or site decontamination operations.
- Coordinate hazard zone control, responder safety protocols, and incident perimeter security in conjunction with law enforcement.

Virginia Department of Emergency Management (VDEM)

- Deploy radiological subject matter experts and support local Norfolk Fire-Rescue teams.
- Conduct or coordinate sampling and testing of air, water, soil, or surfaces for radiological contamination.
- Facilitate access to state and federal contracts for hazardous materials containment, decontamination, and technical guidance.
- Virginia Army National Guard – CERFP (Chemical, Biological, Radiological, Nuclear, High-Yield Explosive Enhanced Response Force Package)
- Respond to support local radiological response upon formal request through the Virginia Emergency Operations Center (VEOC).
- Provide mass decontamination, search and extraction, medical triage, and stabilization of contaminated victims.
- Requests must be approved by the Governor and coordinated through VDEM.

Joint Task Force – Civil Support (JTF-CS)

- Support decontamination operations for transients, patients, responders, and key infrastructure for up to 60–90 days.
- Prepare for surge populations leaving the shelter-in-place zone; support segregation and processing of contaminated individuals and materials.
- Support decontamination of ambulance interiors, aircraft evacuation platforms, emergency rooms, and critical roadways.
- Provide large-scale containment operations through 1–2 battalion/squadron-sized elements for hot-zone access, with 3–5 for sustained containment and materials segregation.

Domestic Nuclear Detection Office (DNDO) – DHS Countering Weapons of Mass Destruction Office

- Lead federal efforts for domestic nuclear detection and integration of federal nuclear forensics programs.
- Provide support for radiological and nuclear detection systems, tracking, and forensics.
- For more, visit: https://www.dhs.gov/domestic-nuclear-detection-office

Other Supporting Resources

- Southside Regional Hazardous Materials Response Team – Provides specialized HazMat capabilities for complex or large-scale incidents.
- Regional Bomb Squad / Emergency Ordinance Disposal (EOD) Teams – Support detection and disarmament of radiological dispersal devices (RDDs) or improvised nuclear devices (INDs).
- Tidewater Regional Technical Rescue Team (TRTRT) – May be deployed for complex rescue operations in contaminated environments or structurally compromised sites.

Additional Considerations

- All contaminated material must be contained, tracked, and properly disposed of in accordance with EPA and DOE guidelines.
- Wheel wash stations, PPE donning/doffing areas, and isolation zones must be established at all entry and exit points to the hot zone.
- Consideration must be given to weathering effects, surface deposition, and radiological half-life in determining the scale and duration of decontamination operations.
- All responders must undergo radiation exposure monitoring and medical surveillance if operating within contaminated zones.
- The Rad Pro Calculator can be used to assist in unit conversions, dose estimations, and radiological decay analysis. (See: http://www.radprocalculator.com/)

EMERGENCY SUPPORT FUNCTION 11: AGRICULTURE AND NATURAL RESOURCES ANNEX

Not Applicable to Radiological Incident Response

Emergency Support Function 11 is not expected to play a direct role in most radiological incident operations. Unless the incident involves contamination of agricultural assets, food or water supply systems, or animal-related impacts, ESF 11 will not be activated.

Should such circumstances arise, Norfolk Emergency Management will coordinate with the Virginia Department of Agriculture and Consumer Services (VDACS), Norfolk Animal Care and Adoption Center

(NACAC), and regional partners to assess food safety concerns, protect livestock and domestic animals, and mitigate natural resource impacts.

EMERGENCY SUPPORT FUNCTION 12: ENERGY

Limited Role in Radiological Incident Response

Emergency Support Function 12 is not expected to play a central operational role during a radiological incident unless the event directly impacts power generation, distribution infrastructure, or critical energy systems.

Should electrical utilities or fuel distribution networks be affected, such as through contamination, physical damage, or required shutdowns for safety, Norfolk Emergency Management will coordinate with Dominion Energy, Norfolk Public Works, and the Virginia Department of Emergency Management (VDEM) to assess the impacts and support power restoration efforts.

- If utility assets are within the contamination zone, ESF 12 partners may be called upon to:
- Assess the radiological safety of energy infrastructure
- Coordinate utility shutdowns or reroutes to support decontamination and public safety
- Support restoration of energy services during recovery

Unless these conditions apply, ESF 12 will remain in a monitoring and support posture during radiological emergencies.

EMERGENCY SUPPORT FUNCTION 13: PUBLIC SAFETY AND SECURITY

Primary Agency: Norfolk Police Department

Support Agencies: Norfolk Fire-Rescue, Norfolk Emergency Management, Virginia State Police (VSP), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), Office of the Chief Medical Examiner (OCME), National Guard, Hampton Roads Marine Incident Response Team

KEY RESPONSIBILITIES

Norfolk Police Department

- Assume incident command for any incident with confirmed or suspected criminal activity, and support the FBI in the event of terrorism.
- Provide Bomb Squad support to Norfolk Fire-Rescue for potential secondary devices or radiological dispersal devices (RDDs).
- Deploy Marine Patrol Units to support incident command for water-based hazards or interdictions. Coordinate with the Hampton Roads Marine Incident Response Team as needed.

- Provide perimeter security, traffic control, and controlled access around the warm zone and incident area.
- Support hospital security operations to ensure safety and manage potential public concerns or disruptions.
- Coordinate evacuation and traffic flow for affected areas in conjunction with the EOC and VDOT.
- Assist with patient tracking, coordination, and status reporting in collaboration with the OCME and mortuary affairs teams.
- Maintain clear command and control functions under Unified Command and contribute to operational planning efforts, including completion of the ICS-204 Incident Communication Plan.

Federal Bureau of Investigation (FBI)

- Lead all investigative operations if the incident is determined to be a terrorist act or involves weapons of mass destruction (WMD).
- Coordinate federal law enforcement response and provide technical assistance to local authorities.
- Department of Homeland Security – Supervisory Chemical Security Inspector
- Support the Incident Commander (IC), Unified Command, or the EOC by liaising with critical infrastructure and industry partners, offering technical insight into chemical or radiological risks.

Virginia State Police (VSP)

- Support local law enforcement with troopers trained in radiological response protocols.
- Deploy VSP Bomb Technicians from the Bureau of Criminal Investigations for suspected or confirmed explosive or radiological threats.
- Provide intelligence and threat assessments via the Virginia Fusion Center.
- May assume a greater Incident Command role if the affected site is state-owned property.
- Assist with law enforcement coordination across jurisdictional boundaries and with enforcement of evacuation orders or perimeter control.

National Guard – Law Enforcement Support

- When operating under Title 32 USC, National Guard forces remain under the command of the Governor of Virginia and may legally perform law enforcement duties within the United States.
- Can support perimeter control, civil disturbance response, security operations, and critical infrastructure protection, as directed through VDEM and the VEOC.

Additional Considerations

- Radiological incidents—especially if criminal or terrorist-related—may involve a high volume of local, state, federal, and military responders, both requested and self-deployed.
- Strict adherence to the Incident Command System (ICS) and established operational structures is critical to maintain accountability and responder safety.
- An updated and interoperable Incident Communication Plan (ICS Form 204) must be implemented and maintained across all ESFs and jurisdictions.
- Law enforcement leadership must remain fully integrated within Unified Command and coordinate daily with Emergency Management for situational updates, intelligence briefings, and resource requests.

EMERGENCY SUPPORT FUNCTION 14: CROSS-SECTOR BUSINESS AND INFRASTRUCTURE

Primary Agencies: Norfolk Emergency Management, Norfolk Department of Economic Development

Support Agencies: Norfolk Department of Public Works, Norfolk Information Technology, Norfolk Department of Finance, Dominion Energy, Norfolk Public Utilities, Downtown Norfolk Council, Hampton Roads Chamber of Commerce, Visit Norfolk, Virginia Department of Emergency Management (VDEM), Virginia National Guard (VNG)

KEY RESPONSIBILITIES

Norfolk Emergency Management

- Coordinate with private-sector stakeholders to assess impacts to critical infrastructure, commercial facilities, and supply chains.
- Facilitate business continuity and economic recovery planning, especially for businesses within or near contaminated zones.
- Serve as the primary liaison with state and federal recovery partners, including VDEM and FEMA, to support long-term infrastructure recovery and access to recovery assistance.
- Coordinate the inclusion of business and infrastructure data into the Incident Action Plan (IAP) and Recovery Plans.

Norfolk Department of Economic Development

- Engage with local business owners, commercial property managers, and economic networks to assess operational status, damage, and business continuity needs.
- Communicate available assistance programs to impacted businesses, including SBA disaster loans and other recovery funding.

- Collaborate with emergency management and the Norfolk Department of Finance to track economic impact assessments and provide recovery status updates to City leadership.

Norfolk Department of Public Works / Utilities / Information Technology

- Provide assessments and restoration status of city infrastructure, including roads, water systems, stormwater systems, and data networks.
- Coordinate repair prioritization for essential infrastructure supporting business districts, ports, and critical facilities.

Dominion Energy

- Coordinate restoration of power infrastructure and ensure communication with Emergency Management and major commercial facilities.
- Participate in unified briefings and planning cycles for continuity of utility services.

Downtown Norfolk Council / Hampton Roads Chamber of Commerce / Visit Norfolk

- Assist with the dissemination of situational updates and recovery resources to local business owners, retailers, and tourism stakeholders.
- Support coordination of communications between the city and business sectors to ensure awareness of access restrictions, recovery efforts, and safety measures.

Virginia Department of Emergency Management (VDEM)

- Support the city in infrastructure impact assessments, technical assistance, and coordination with FEMA for long-term recovery planning.
- Help facilitate cross-sector collaboration and business sector integration into emergency operations.

Additional Considerations

- Businesses operating within or near the radiological contamination zone may require support for recovery planning, insurance navigation, and re-entry coordination.
- Cross-sector infrastructure systems—including energy, water, transportation, communications, and supply chains—must be continuously evaluated for operational status and restoration priorities.
- Long-term recovery may include collaboration with state and federal partners to implement economic revitalization strategies and infrastructure modernization efforts.
- Norfolk Emergency Management should consider activating a Business Recovery Task Force to coordinate private-sector outreach, communication, and technical assistance.

EMERGENCY SUPPORT FUNCTION 15: EXTERNAL AFFAIRS

Primary Agency: City of Norfolk Communications

Support Agencies: Norfolk Emergency Management, Norfolk Department of Public Health, Norfolk Cares Call Center, Norfolk Public Schools, Virginia Department of Health (VDH), Virginia Emergency Operations Center (VEOC) Joint Information Center, 2-1-1 Virginia, Digital Volunteer Organizations (e.g., CEDR)

KEY RESPONSIBILITIES

City of Norfolk Communications / Joint Information Center (JIC)

- Refer to the Crisis Communication Plan for activation protocols and communication coordination.
- Deploy a JIC representative to Incident Command, if safe, to facilitate field-based media operations and liaison functions.
- Coordinate unified messaging across all ESFs and agencies within Unified Command for both public and media audiences.
- Disseminate critical information to the public through Norfolk Alert, 2-1-1 Virginia, Norfolk Cares Call Center, and social media platforms.
- Issue press releases, media updates, social media messaging, and operational updates in coordination with the Norfolk EOC.
- Share executive briefings and legislative updates, and coordinate VIP visits and press conferences.
- Ensure open access and transparency with credentialed local media representatives, who should be safely accommodated at the EOC and invited to relevant briefings.
- Coordinate information for ALLEXCHANGE and deliver internal communications to City staff via Norfolk Alert.
- Collaborate with digital volunteer organizations, such as the Crowd Emergency Disaster Response Digital Corps (CEDR), to enhance information reach through verified and amplified messaging.

Norfolk Cares Call Center (757-664-6510)

- Serve as the primary non-emergency information line for community inquiries during the incident.
- Route or respond to frequently asked questions and emerging concerns.
- Share call pattern trends with the JIC to help guide public messaging priorities and media outreach.

2-1-1 Virginia

- Support the Norfolk JIC and Norfolk Cares Call Center upon request.
- Provide community resource information, including shelter details, health services, and recovery assistance.

Norfolk Department of Public Health (NDPH) Public Information Officer (PIO)

- Assign PIO staff to both the EOC and the JIC.
- Collaborate with the CDC, EPA, and VDH to develop, localize, and disseminate accurate message points on radiation exposure symptoms, protective actions, and public health concerns.
- Serve as a subject matter expert liaison to interpret technical guidance for public distribution.

Norfolk Public Schools – Public Information

- Coordinate with the Norfolk JIC on public updates related to school closures, shelter operations, or educational continuity.
- Communicate directly with students, families, and staff to ensure consistent, accurate messaging during the response and recovery phases.

Virginia EOC Joint Information Center (VEOC JIC)

- Coordinate messaging at the state level with VDH, NDPH, and the Norfolk EOC.
- Support the alignment of local, state, and federal communications strategies.

Additional Considerations

- All fatality and investigative information must be cleared through the Office of the Chief Medical Examiner (OCME) and the lead law enforcement agency prior to public release.
- Public messaging must be inclusive and accessible, reaching individuals who are blind, deaf, hard of hearing, or limited English proficient. Utilize Language Line services, TV48, and accessible formats as needed.
- Emphasize accuracy, timeliness, and transparency to reduce public fear and prevent misinformation.
- Ensure coordination between JIC, Norfolk Alert, and social media teams to maintain unified messaging across all platforms and phases of the incident.

SUPPORTING PLANS AND POLICIES

- Commonwealth of Virginia Emergency Operations Plan: Volume 4, Hazardous Materials and Terrorism Consequence Management Plan
- Hampton Roads Mass Casualty Incident Response Guide
- Hampton Roads Multi-Jurisdiction IED Security Plan: Norfolk, VA (2009) //FOUO
- Hampton Roads Regional Catastrophic Planning Team's Southeast Virginia / Northeast North Carolina Multiple Improvised Explosive Devices Incident Annex (2011)
- National Response Framework: Nuclear/Radiological Incident Annex
- Office of the Chief Medical Examiner Fatality Plan (Part 14-D-2)
- U.S. Coast Underwater Terrorism Preparedness Plan (UTPP) // SENSITIVE SECURITY INFO

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- Homeland Security Act of 2002 (PL 107-296 Section 301) https://www.dhs.gov/homeland-security-act-2002
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- Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law
- 93-288, as amended. http://www.fema.gov/about/stafact.shtm

COMMONWEALTH OF VIRGINIA

- Radiation Control Act, Code of Virginia Section 32.1-227 through 32.1-238 https://www.vdh.virginia.gov/radiological-health/radiological-health/laws-and-regulations/
- Virginia Radiation Protection Regulations – Chapter 481 https://law.lis.virginia.gov/admincode/title12/agency5/chapter481/

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- CDC: Frequently Asked Questions about Dirty Bombs https://emergency.cdc.gov/radiation/dirtybombs.asp
- CDC: Determining Deaths from Radiation Emergency: https://www.cdc.gov/nceh/radiation/emergencies/determinedeaths.html?CDC_AA_refVal=https%3A%2F%2Femergency.cdc.gov%2Fradiation%2Fdeterminedeaths.html
- Commonwealth of Virginia Emergency Operations Plan: Radiological Emergency Response (2012)
- DHS Nuclear / Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans (October 2016)
- EPA: Radiation Protection: https://www.epa.gov/radiation
- Gardner, Science of Fear (p. 258-259)
- Ready.Gov: Nuclear Explosions: https://www.ready.gov/nuclear-explosion
- Ready.Gov: Radiological Dispersion Device: https://www.ready.gov/radiological-dispersion-device
- U.S. Department of Health & Human Services Radiological Dispersal Device Playbook: http://www.phe.gov/Preparedness/planning/playbooks/rdd/Pages/default.aspx
- FEMA's Nuclear / Radiological Incident Annex: https://www.fema.gov/sites/default/files/documents/fema_incident-annex_nuclear-radiological.pdf
- USNorthCom CONPLAN 3500-08, CBRNE CM
- Virginia Department of Health Emergency Response: https://www.vdh.virginia.gov/radiological-health/radiological-health/emergency-response/
- Virginia Department of Emergency Management Radiological Emergency Preparedness: https://www.vaemergency.gov/divisions/response-programs/special-operations/

APPENDICES

ACRONYMS LIST

- (ALLEXCHANGE) Internal City of Norfolk Staff Communication Platform
- (ASPR) Assistant Secretary for Preparedness and Response
- (CBRNE) Chemical, Biological, Radiological, Nuclear, and Explosive
- (CDC) Centers for Disease Control and Prevention
- (CEDR) Crowd Emergency Disaster Response Digital Corps
- (CERCLA) Comprehensive Environmental Response, Compensation, and Liability Act
- (CERFP) Chemical, Biological, Radiological, Nuclear, High-Yield Explosive Enhanced Response Force Package
- (CSB) Community Services Board
- (DHS) Department of Homeland Security
- (DHHS) Department of Health and Human Services
- (DNDO) Domestic Nuclear Detection Office
- (DOE) U.S. Department of Energy
- (EOC) Emergency Operations Center
- (EPA) U.S. Environmental Protection Agency
- (ERT-A) Emergency Response Team – Advanced
- (ESF) Emergency Support Function
- (FAC) Family Assistance Center
- (FBI) Federal Bureau of Investigation
- (FEMA) Federal Emergency Management Agency
- (FOUO) For Official Use Only
- (FOSC) Federal On-Scene Coordinator
- (FRC) Family Reception Center
- (GIS) Geographic Information System
- (HP) Health Physics Technician
- (HRIMT) Hampton Roads Incident Management Team
- (HRSD) Hampton Roads Sanitation District
- (HRT) Hampton Roads Transit
- (ICS) Incident Command System
- (IAP) Incident Action Plan
- (IED) Improvised Explosive Device
- (IMAAC) Interagency Modeling and Atmospheric Assessment Center
- (JFO) Joint Field Office
- (JIC) Joint Information Center
- (JTF-CS) Joint Task Force – Civil Support
- (MERS) Mobile Emergency Response Support
- (MMRST) Metropolitan Medical Response System Team

- (NACAC) Norfolk Animal Care and Adoption Center
- (NDMS) National Disaster Medical System
- (NDPH) Norfolk Department of Public Health
- (NF-R) Norfolk Fire-Rescue
- (NG) National Guard
- (NIT) Norfolk International Terminals
- (NNSY) Norfolk Naval Shipyard
- (NSN) Naval Station Norfolk
- (OCME) Office of the Chief Medical Examiner
- (PIO) Public Information Officer
- (POD) Point of Dispensing
- (PSAP) Public Safety Answering Point
- (RHCC) Regional Hospital Coordination Center
- (RNA) Rapid Needs Assessment
- (RDD) Radiological Dispersal Device
- (SAR) Search and Rescue
- (SCADA) Supervisory Control and Data Acquisition
- (SitRep) Situation Report
- (SSI) Sensitive Security Information
- (TRTRT) Tidewater Regional Technical Rescue Team
- (UTPP) Underwater Terrorism Preparedness Plan
- (USAR) Urban Search and Rescue
- (USACE) U.S. Army Corps of Engineers
- (VEOC) Virginia Emergency Operations Center
- (VDACS) Virginia Department of Agriculture and Consumer Services
- (VDEM) Virginia Department of Emergency Management
- (VDH) Virginia Department of Health
- (VHASS) Virginia Healthcare Alerting and Status System
- (VIP) Very Important Person
- (VOAD) Voluntary Organizations Active in Disaster
- (VSP) Virginia State Police

BATTLE RHYTHM

POSTURE		BATTLE RHYTHM
T + 30 Min	ALL	Immediately identify and report potential radiological indicators or suspicious items (placards, radiation symbols, physical symptoms, or plume).
	ALL	Don the appropriate Personal Protective Equipment (PPE) based on radiological response protocols.
	ESF 4	Law Enforcement and Fire-Rescue respond and establish on-scene Incident/Unified Command.
	ESF 5	Conduct initial hazard assessment and determine potential for radiological contamination.
	ESF 4 / ESF 13	Initiate plume modeling and share with EOC to determine potential impact areas.
	ESF 4 / ESF 13	Establish safe perimeter, staging areas, and a resource screening/security plan.
	ESF 4 / ESF 13	Safety Officer advises IC/UC on radiological exposure concerns, monitoring, and responder rotation.
	ESF 15	Send Wireless Emergency Alert (WEA) and Emergency Alert System (EAS) message with immediate protective actions (e.g., shelter-in-place, evacuation if required).
	ESF 5	Notify City Manager and Team Norfolk partners; include notifications to VDEM, VDH, EPA, DOE, FBI (if criminal), VDEQ, and USCG (if port/maritime-related).
	ESF 5	Assign a dedicated conference bridge or virtual coordination platform for Unified Command and stakeholders.
	ESF 5	Create an incident entry in HSIN and begin official incident documentation.
	ESF 5	Prepare the Emergency Operations Center for activation (if not already active).
T + 1 Hour	ESF 4 / ESF 13	Confirm Unified Command structure and ensure all responding agencies are logged in and represented.
	ESF 4	Confirm the exclusion zone, contamination reduction zone, and support zone.
	ESF 4	Establish a decontamination corridor for ambulatory and non-ambulatory patients.
	ESF 8	Begin triage and transport of exposed individuals to designated hospitals with decontamination capability.
	ESF 5	Launch full activation if needed; assign ESF liaisons and begin situation updates.
	ESF 15	Begin coordination of public messaging with NDPH, VDH, and Unified Command.
	ESF 1 / ESF 3 / ESF 12	Begin initial damage and exposure assessments from utilities, public works, and infrastructure sectors.

	ESF 8	Activate health surveillance, exposure monitoring, and request emPOWER data pull (if necessary).
	ESF 7	Deploy staging areas and identify resources needed for sheltering, decontamination, and responder support.
T + 2 Hours	ESF 5	IC/UC – Finalize Incident Action Plan (IAP) for the next operational period; begin regular ICS-201/202 briefings.
	ESF 6	Confirm deployment of Shelter Tiger Team (if evacuation is in effect); support decontamination logistics.
	ESF 8	Update VHASS with patient capacity; begin coordination with MRC, EVHC, and NDMS if needed.
	ESF 8	Establish responder monitoring protocols and health evaluations for those operating in the hot zone.
	ESF 7	Source radiation detection monitors, dosimeters, PPE resupply, and decontamination kits.
	ESF 15 / ESF 6	Begin public helpline support; JIC shares FAQs and addresses call patterns.
	ESF 8	OCME – Begin coordination with Mortuary Affairs for fatality management and field response planning.
T + 3 Hours	ESF 4 / ESF 5	Conduct operational transition meeting with field commanders and EOC Section Chiefs.
	ESF 8 / ESF 15	Prepare messaging for anticipated radiation-related symptoms and public health hotline support.
	ESF 5 / ESF 15	Push consistent messaging on protective measures, evacuation zone updates, and radiation risk communication.
	ESF 5	Support the development of IAP, SitReps, and resource forecasting.
	ESF 8 and ESF 5	Deploy state technical experts to assist with environmental monitoring and plume tracking.
	ESF 8	Evaluate hospital impacts and plan for inter-facility transfers or alternate care sites, if needed.
T + 4 Hours and Beyond	ESF 4 / ESF 5	Rotate operational periods (typically 8 or 12-hour cycles); implement staff rest plans.
	ESF 5	Continue updating IAPs, SitReps, and prepare transition to recovery planning.
	ESF 10 / ESF 7	Continue decontamination operations, including materials and transportation assets.
	ESF 7	Coordinate delivery of specialized assets (e.g., mobile labs, radiation analysis support, EPA/DOE cleanup teams).
	ESF 15	Update messaging across multilingual platforms, accessible channels (TV48, Norfolk Alert, etc.).
	ESF 14	Begin coordination with ESF 14 partners on infrastructure/business impact assessments.
Recovery Phase	ESF 5	Transition EOC from response to recovery; stand up Recovery Planning Team.

	ESF 3 / ESF 10	Begin environmental remediation planning and coordinate cleanup funding/approvals.
	ESF 8	Continue population monitoring, mental health support, and long-term health assessments.
	ESF 6	Operate Family Assistance and Reception Centers for survivors and families.
	ESF 15	Provide ongoing updates to the public about area reentry, contamination clearance, and support services.
	ESF 8 / ESF 5	Coordinate federal and state disaster declarations, long-term recovery assistance, and community outreach.
	ESF 14	Assess financial impacts and pursue SBA or FEMA recovery programs for affected residents and businesses.