



State Health Care Coalition Radiologic Surge Annex

Louisiana ESF8 Health & Medical Preparedness and Response
Network Coalition

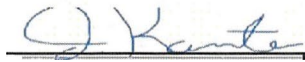
May 2023

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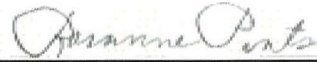
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Approval and Implementation

The following signatures hereby approve this plan. The ESF8 Radiologic Surge Annex is effective immediately and supersedes previous instruction and guidance.



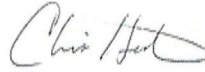
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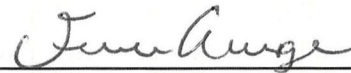
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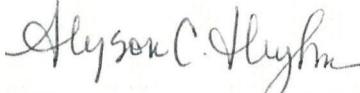
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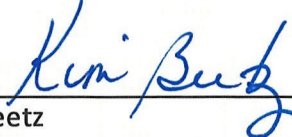
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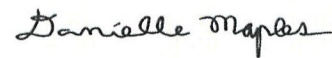
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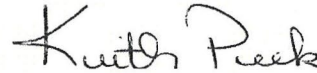
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Record of Distribution

Louisiana ESF8 and HPP Team is responsible for the distribution, tracking, and revision of this plan.

Date	Recipient	Platform
May 25, 2023	ESF-8 Leads – LDH SHO and EP Director	Email

Record of Changes

Louisiana ESF8 maintains the HCC Radiologic Surge Annex as a living document intended to be annually reviewed and revised, with input from stakeholders.

Date	Description	Pages
MM/DD/YYYY	[Description of Change]	[Pages Effected]

Training, Exercise, and Engagement Activity

Louisiana ESF8 Network is committed to ongoing training, exercise, and engagement for the HCC Radiologic Surge Annex to validate public health and healthcare capabilities in the state of Louisiana.

Date	Activity Summary	Parties Involved	Entry Made by

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Introduction

A radiation emergency may be defined as an event where an unintended exposure, release, or potential for exposure/contamination from a radiologic source or device has occurred. During such events, a surge of injured and uninjured patients with varying degrees of exposure uncertainty may present to hospitals and/or community reception sites. This Radiologic Surge Annex provides the Emergency Support Function-8 (ESF-8) network of state and regional healthcare coalition (HCC) leads with a framework of response considerations along with an understanding of the actual risks and complexities that accompany a radiologic emergency. This document will aid the ESF-8 network in guiding response efforts of hospitals and Emergency Medical Services (EMS) agencies during surge events for carrying out essential core functions of providing accurate information and assisting in resource coordination.

This plan is intended to outline the range of health impacts that may be experienced by patients from a radiologic emergency. In some plausible scenarios where exposure has been validated, the clinical guidance and treatment for patients may be relatively simple or there may be no treatment and basic decontamination is all that is necessary. On the contrary, some radiologic emergencies which occur in concurrence with other incidents or hazards will trigger a more in-depth clinical response – ex. explosions involving radiologic material prompt prioritized treatment of traumatic injuries, or exposure to both radiological material and other hazardous chemicals initiates more extensive decontamination and a need for increased healthcare worker protective measures. Lastly, large scale radiologic emergencies with the potential to present a lot of casualties and long-lasting health impacts will involve a host of different federal and state response agencies and subject matter experts. Other state and federal plans may be activated during such incidents. Regardless of the event size or scale, the hospital(s) operations may be significantly interrupted or overwhelmed during a response thus an effective and coordinated effort by the ESF-8 network of coalitions and partners is paramount.

Purpose

This annex is a supplemental document to the *State ESF-8 Network Coalition Response Plan* and provides guidance to support a response to a radiologic or nuclear incident resulting in a surge of patients into the Louisiana acute healthcare systems. This plan identifies subject matter experts, existing response procedures, and specialized resources available to HCCs and the state to support response to a radiologic or nuclear incident which may impact a community and the overall healthcare system. The goal is to share quality information and guidance with medical experts treating patients exposed to dangerous amounts of radioactive material as well as manage clear messaging to the public to prevent unnecessary fear and confusion. Individual healthcare facilities within HCCs are encouraged to develop more detailed policies and procedures that support individual operations and may reference this document to assist with their institutional planning for radiation emergencies.

Scope

This plan applies to all participating ESF-8 healthcare coalitions, organizations and agencies contained within the geographical boundaries of Louisiana. Key stakeholders and response partners referenced span from each level of governmental agency and partner organizations – federal, state, regional and local jurisdictions, along with healthcare facilities. This plan outlines the most critical response procedures necessary for a coordinated response to a radiologic or nuclear incident including notification and information sharing for situational awareness, medical considerations for first responders and emergency departments, and response partner roles and responsibilities.

Overview

Louisiana ESF8 Health & Medical Preparedness and Response Network

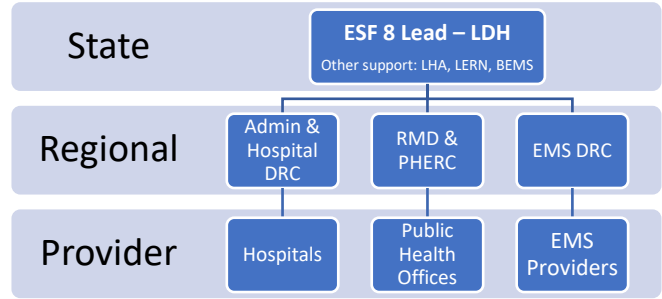
The Louisiana ESF8 Health & Medical Preparedness and Response Network Coalitions prepare, plan, coordinate, and facilitate emergency support to public health and medical emergencies. This network is primarily anchored in emergency preparedness and response functions with the ability to incorporate other subject matter experts and industries as the event moves through different stages of response.

The Louisiana ESF8 Network is organized into nine regions that span 64 parishes. Each region is comprised of a continuum of resources ranging from designated Trauma hospitals, Tier 1 and Tier 2 hospitals, Primary Care, Federally Qualified Health Centers (FQHCs), Public Health Units, outpatient clinics, psychiatric facilities, rehabilitation and long-term facilities, and EMS services. Louisiana's hospitals provide various levels of care to meet the immediate medical needs of citizens every day and

during disasters. A classification system of hospitals was identified based on capabilities provided. Hospitals serve voluntarily as one of three levels: Designated Regional Hospitals (DRH), Tier 1 Hospitals, and Tier 2 Hospitals. For more information about the ESF8 structure, reference the *Louisiana ESF8 Network Coalition Plan*.

Regional Healthcare Coalition

Each of the nine regions of Louisiana contains regional ESF8, health and medical response partners who work in coordination and collaboration with one another. These healthcare coalitions are led by designated regional coordinators (DRCs) assist with planning and response; ensuring objectives align with individual local providers as well as other health and medical industry partners.



Radiologic Risk Assessment

- State and regional all-hazards risk assessments in general do not indicate a radiologic incident as a high probability or high risk compared to other threats in Louisiana.
- Some regions may have a slightly elevated risk rating or conduct more robust HCC planning based on their proximity to a nuclear power plant.
- In context of medical surge, it is important to assume both possible scenarios of an accidental and intentional release.
- Understanding radiation sources, uses and categorization of their potential dangers are important for risk assessments and planning.
- A multitude of credible sources of information is freely accessible and created for Hospital and EMS planners along with frontline clinicians. All planners and responders are encouraged to access these resources for additional relevant information when conducting internal risk assessments and planning for response to events in their communities.

The International Atomic Energy Agency (IAEA) identifies radiologic sources and devices based on how they are used and breaks them into six groups:

- a. Medical uses
- b. Non-medical irradiation of products
- c. Gauging systems
- d. Imaging systems (radiography)
- e. Materials analysis
- f. Miscellaneous uses

Louisiana Sources & Prevalence

A statewide assessment of known radiologic sources by licensee type gives insight into the most common groups of radiologic sources in Louisiana – outlined in *Appendix A*.

- Medical uses of radiologic sources and devices in healthcare facilities.
- Gauging, imaging and materials analysis systems which are common in industrial settings, engineering projects, and oil and gas industries.

While radiation is relatively common in the environment, routinely used in everyday items, and is essential to industrial processes and medical treatments, the amounts of energy and how it is used determine how harmful it may be to humans and the environment. The Louisiana Peacetime Radiation Response Plan (LPRRP) provides in-depth review of exposure threats and considerations that may be essential for ESF-8 planners including first responders, EMS and first receivers at hospital Emergency Departments (EDs).

The ESF-8 network, hospitals, EMS providers, regional coordinators, and state partners should plan, educate, train and exercise for an event based on the information presented in this section. The most common sources and devices of exposure in Louisiana outlined in *Appendix A* are also categorized by IAEA as some of the most dangerous to health and life. The *Radiologic Threat Awareness* brochure, co-authored by the National Counterterrorism Center (NCTC), the Department of Homeland

Security (DHS) and the Federal Bureau of Investigation (FBI) is a tool for first responders and planners that defines the categories and depicts common radiologic sources – can be found in *Appendix B*.

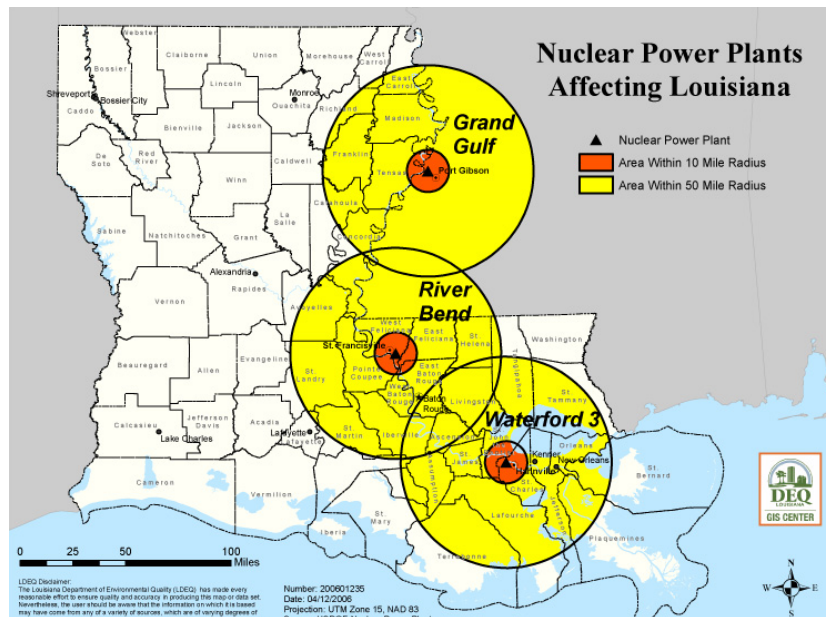
- Category 1 sources considered most dangerous - used in medical settings.
 - Time to likely cause permanent injury is within minutes.
 - Time likely to cause fatality is few minutes to one hour.
- Category 2 sources considered very dangerous – used in both the medical and industrial setting.
 - Time to likely cause permanent injury is within minutes to hours.
 - Time to likely cause permanent injury is within hours to days.
- Category 3 sources considered dangerous - used in industrial setting.
 - Permanent injury if handled or in close contact to source for hours.
- Category 4 sources considered unlikely dangerous – commonly used in the industrial setting.
 - Temporary injury expected if sources handled for hours or near sources for weeks.
- Category 5 sources are considered most unlikely dangerous – commonly used and found in the commercial setting.
 - No permanent injury expected if in contact or near contact to source.

Nuclear Power Plants

There are three nuclear power plants inside and bordering Louisiana that require close planning, coordination, and regular exercising.

- 1) Waterford 3 Steam Electric Station – Region 3
- 2) Grand Gulf Nuclear Station* – Region 8
- 3) River Bend Station – Region 2

The Louisiana Department of Environmental Quality (DEQ) along with the Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP) maintain the LPRRP that addresses response to incidents at each of these sites. Federal regulatory requirements ensure that these sites maintain plans and coordinate their planning efforts with state and local jurisdictions along with conducting routine planned exercises. In these plans, specific hospitals and EMS agencies have been identified and are also involved in planning and exercise activities. To accompany the LPRRP, the DEQ has published Environmental Protection Agency (EPA) adopted Protective Action Guides (PAGs) for communities, local officials, and responders for addressing both environmental and human exposures during a nuclear power plant incident.



Incident Types

Another important consideration assessing a risk is understanding the ways in which a radiation source may become a risk. Most sources are installed in permanent or fixed locations. This is true for the common sources in Louisiana – at processing sites, in hospitals and medical or research facilities. However, reloading and swapping sources at these fixed sites requires transportation of sources. There are also known uses of radiation in the medical and industrial field that may be mobile i.e. radiopharmaceuticals, radiography cameras, soil density gauges, etc

- Accidental releases or exposures may occur within the settings in which they are used or enroute to their intended site(s). Sources are reported to be transported by all methods including rail, road, maritime and air. In Louisiana, a primary transport method closely monitored is by roadway. Maps in *Appendix C* outline some of the Cesium-137 transport routes. The following are common accidental incident scenarios reported:
 - Lost sources – also known as “orphan” sources which are reported as not arriving at their shipped destination.

- Insignificant quantities of sources that are legally obtained but collected and stored into larger amounts that become more dangerous or concerning.
- Mishaps in handling of sources at sites such as medical facilities, industrial sites, and research laboratories.
- Secondary incidents that may expose a source – i.e. traffic accidents in transport, fires or natural disasters at fixed source sites.
- Nuclear Power Plant reactor cooling failure causing a meltdown.
- Intentional releases are considered planned acts of terrorism. These events are often associated with the use of radiologic material in building Radiological Dispersal Devices (RDD) or Radiologic Exposure Devices (RED). The access to radiologic sources for building these types of devices can be attributed to lost or stolen sources. The FBI, DHS and NNSA identify the following sources that could be sought by terrorists and used as weapons in an attack (*Appendix B*).
 - Americium-241
 - Cobalt-60
 - Cesium-137
 - Iridium-192

Additionally, access to exploitable nuclear sources in the U.S. and abroad are of concern for federal law enforcement. This includes development of improvised nuclear devices (IND), detonation of a conventional nuclear weapon or a compromise of a nuclear facility by way of a physical or cybersecurity event.

Assumptions

Radiologic Source Exposure Incident

- Hospitals are required by The Joint Commission to maintain an all-hazards emergency management plan that may be activated during response to a radiologic incident.
- Medical experts – Radiologists, oncologists, health physicists, etc. are trained in the safe management and handling procedures for radiologic sources and devices.
- LaDEQ Radiation Regulations outline the requirements and expectations for licensees and assigned Radiation Safety Officers (RSO).
- Users of radioactive materials in all sectors – medical, academic, and many industrial settings – are aware of authorities and regulations, as well as notification and reporting expectations should a loss, theft or release occur.
- Radioisotopes are used extensively in medical diagnostics but are of minimal danger when used properly.
- Radiation incidents may be accidental or intentional, requiring prolonged response and extensive resource management challenges from responders from multiple sectors and agencies.
- Federal, state, and local emergency resources will all be needed simultaneously for large scale events.
- The roles and responsibilities of organizations may change depending on the size and scope of an incident and the impacted jurisdictions.

Nuclear Power Plant Release Incident

- Response to an event at a nuclear power plant site may involve specified agencies, response partners and pre-identified hospitals and EMS agencies who are already familiar with plans and response roles.
- Communities surrounding these sites will expect clear direction and guidance from local and state authorities along with site officials.
- Louisiana does not stockpile potassium iodide (KI) for public distribution.
- Evacuation planning to prevent/limit exposure is the primary course of action for protecting the public.
- Radiologic response to a nuclear incident may not be an emergency that would trigger Stafford Act, resulting in a lack of FEMA emergency funding and reimbursement.

Concept of Operations

Activation and Notification

This plan may be activated during any event in which a radiologic exposure has occurred requiring the evaluation and treatment of patients in the field or a hospital. Suspected incidents of potential exposure to many citizens may also trigger the activation of this plan. Each ESF-8 HCC maintains a regional preparedness and response plan that outlines additional notification methods and triggers for activation of response plans.

- Louisiana Department of Environmental Quality (LaDEQ) will be a lead entity for activation of state plans and notification of an event at a nuclear power plant.
- Radiation Safety Officers (RSOs) in industrial and healthcare settings are responsible for reporting exposure incidents to LaDEQ for reporting to the Nuclear Regulatory Commission (NRC).
- Nuclear Regulatory Commission (NRC) Regional State Liaison Officers may notify jurisdictional and state partners, including offices of homeland security, of incidents reported by licensees which may warrant action or awareness.
- Incidents may be reported through the following channels - NRC Operations Center Hotline, the LaDEQ Radiation Hotline, or the Louisiana State Police (LSP) Hotline which may warrant further notification to other state ESFs and/or jurisdictions which may trigger activation of plans.
- Local, state, or federal law enforcement will provide notification of credible terroristic or malicious threats.
- Responders – fire, EMS, hazardous materials (HazMat) teams, and hospital ED staff – will push notification to the LSP hotline or parish offices of homeland security and emergency preparedness (OHSEPs) of suspected radiologic emergencies per routine HazMat notification plans.
- Hospital EDs suspecting a radiologic incident internally will notify local officials including regional ESF-8 leads who will alert other state agencies and partners, including GOHSEP and LaDEQ.

For incidents prompting broad notification to health and medical partners in a specific jurisdiction or region, the state’s ESF-8 portal will be used to disseminate mass notification. Supplemental notification and resources may be supplied through the ESF-8 Portal Messaging platform as well as through the DRC network. Reference *ESF-8 Network Coalition Response Plan* and the *ESF-8 Communications Annex*.

Coordination and Situational Awareness

The entities and partners outlined in the *Roles and Responsibilities* section include notable agencies with a response role who will be an integral part of coordination. Some of the organizations outlined have a more forward-facing planning and response role, while others listed have a more secondary role in response based on the event type. The ESF-8 Network will work with GOHSEP, state agencies, and experts to obtain credible information and guidance that should be shared with health and medical partners and used to inform HCC member response efforts. State ESF-8 Network Response Plan and HCC Response Plans outline specific methods that may be used to maintain situational awareness and coordination.

Roles and Responsibilities

Partner		Planning & Response Roles
Individual HCC members	Hospitals	Tier 1 Hospitals <ul style="list-style-type: none"> • Maintain all-hazards response plans which include the risk assessment of a radiologic incident and an emergency operations plan which outlines key response strategies. • Radiologists, radiation oncologists and medical/health physicists may play a critical role in helping to respond and provide accurate information to patients and the public. • Hospitals using radiation sources have an identified Radiation Security Officer (RSO) who may serve as the radiological medical technical specialist in the HICS structure. The RSO may provide SME guidance to HCC members. • Track patients received from an incident and share pertinent information with local, state or federal officials as requested. • <i>Appendix D</i> outlines survey results from a Hospital Preparedness Program survey conducted of Louisiana Tier 1 Hospital Radiologic Readiness and Capabilities in March 2023.
	EMS	<ul style="list-style-type: none"> • Understand ICS and follow scene management and notification protocols. • EMS agencies coordinate with hospitals, local officials on scene and incident command to understand the situation, exposure risks of patients, triage protocols and protection methods. • Some EMS agencies may have access to detection equipment through their local Fire Department and Hazardous Materials (HazMat) teams.
	Parish Offices of Homeland Security and Emergency	<ul style="list-style-type: none"> • Supports and maintains awareness of multi-agency response. • Provides situational awareness and assists with logistical support to ESF8/health and medical response function of local HCC members and providers.

Partner		Planning & Response Roles
Regional HCC Leads	Preparedness (OHSEP)	<ul style="list-style-type: none"> Understands the radiologic risks in their communities and participates in required, graded exercises when relevant to their jurisdiction. Disseminates pertinent and timely information with the public by way of joint communication.
	ADRC/Hospital DRC	<ul style="list-style-type: none"> Engage in regional and local exercises of plans. Initiate and/or support mass notification to HCC members. Communicate and coordinate with DRC network inside and outside of the region to monitor the situation and identify available resources to support surge strategies. Understand decontamination capabilities of various hospitals in the region. Coordinate and request radiologic subject matter expertise, guidance and detection and protection resources. Assist with coordinating patient placement and patient tracking from an incident with multiple hospitals involved.
	EMS DRCs	<ul style="list-style-type: none"> Ensure communication among jurisdiction response partners, first responders and healthcare facilities if patient movement is necessary. Assist with coordinating patient tracking from scene to hospital(s). Request support for surge at field treatment sites, including request for additional supplies, equipment, and PPE.
	Public Health Emergency Response Coordinator (PHERC) & Regional Medical Director (RMD)	<p>Under guidance and direction of local and state officials, along with LADEQ among other SME's, carry out the following functions:</p> <ul style="list-style-type: none"> Assist with carrying out local or regional sheltering operations if warranted, under guidance and recommendation of local/state officials, LADEQ or other industry partners. Support established procedures at community reception sites pertaining to detection, screening, monitoring and point of dispensing if warranted. Coordinate communication and information sharing by providing guidance to businesses, non-acute healthcare entities and the public about risks and protective actions.
	GOHSEP Regional Coordinator(s)	<ul style="list-style-type: none"> Coordinate resource requests with Parish OEPs as local capabilities are exceeded. Maintain situational awareness and share information with state EOC as needed. Assist with joint communication to local jurisdictions and parishes to aid in providing consistent information to the public.
State Response Partners	LDH/ESF8	<p>ESF-8 Network</p> <ul style="list-style-type: none"> Participate in state exercises with nuclear sites and engages in state and nuclear facility planning activities. Maintain situational awareness and support notification to external ESF8 partners. Receive resource requests for surge supplies including but not limited to PPE, detection equipment, subject matter expertise, etc. Make formal requests for support or resources from other state agency partners, external state support (EMAC) or federal support when necessary. Office of Public Health may activate the LDH EOC. The OPH Pharmacist may assist the SHO and RMDs with allocation of scarce pharmaceuticals, such as KI. Bureau of Media and Communications (BMAC) may assist with dissemination of critical information. Maintain the State's <i>Framework for Mitigating Crisis Environments, Crisis Standards of Care Guidance and Resources</i> which may be activated in response to large events.
	Louisiana Emergency Response Network (LERN)	<ul style="list-style-type: none"> Manages a 24-hour call center which may assist with sending ESF-8 portal messaging and broad notification of radiologic events to Hospitals and EMS partners across a region or the state. Maintains event specific protocols including burn, trauma, and mass casualty incidents which may be activated prompting coordination with trauma centers and EMS agencies. Uses the ESF-8 portal to maintain awareness of hospital capabilities and capacities and can assist with patient routing from scene of an incident to appropriate facility. Manages the state Tactical Operations Center (TOC) during large scale events where surge ambulances may be activated for response.

Partner	Planning & Response Roles
Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)	<ul style="list-style-type: none"> • Partner with LaDEQ to conduct statewide planning with all nuclear sites, parishes, and appropriate agency or Emergency Support Function (ESF) leads. • Activate the emergency operations center (EOC) and make formal state declaration and request federal declarations if necessary. • Establish joint information center with all relevant response partners and agencies. • Coordinates planning with the Louisiana Preventive Radiological/Nuclear Detection Program (PRND) in partnership with the Domestic Nuclear Detection Office (DNDO) to protect the public through detection and interdiction of radiological/nuclear materials outside regulatory control.
Louisiana National Guard (LANG)	<ul style="list-style-type: none"> • WMD - Civil Support Team (CST) provides support to civil authorities during domestic incidents which include the use of WMDs, including radiologic detection; provide healthcare training for CBRN incidents. • LANG maintains a specialized trained Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Enhanced Response Force Package (CERFP) that can respond as requested to events where patient decontamination, emergency medical services, and field triage and treatment may be warranted. • The CERFP medical element may be requested through GOHSEP and The Adjutant General (TAG) to support response in the field or augment at a hospital
Louisiana Department of Environmental Quality (LDEQ)	<ul style="list-style-type: none"> • Regulates radiological sources and use in Louisiana. • Participate in state exercises with nuclear sites and engages in state and nuclear facility planning activities. • Provides special instructions to hospitals regarding decontamination procedures following a power plant event. • Plans and provides guidance during response and lead coordinating entity for radiological incidents at one of three nuclear sites that impact the State of Louisiana. • Responsible for providing annual refresher trainings to offsite response organizations identified in plans/procedures responsible for responding to power plant events. • Responsible for updating state radiological plans and procedures related to response to nuclear incidents at the nuclear power plants that impact Louisiana. • Maintains pre-identified staff and teams to deploy to sites to support and advise on field operations, state and parish command center operation, and joint information centers.* • Department secretary engages in Unified Command group with GOHSEP Director and Governor and provides protective action recommendations to the parishes.* • Coordinates response with all state, federal, and SMRAP partners.* • Coordinates with pre-identified hospitals in designated areas – trained annually along with EMS.* • Assist with guidance and training for Reception Center and EWMDs when evacuation orders are issued.* • Coordinates with LDH State Health Officer to recommend KI for workers responding at plants and institutionalized individuals – not stockpiled and issued for general population.* • Responsible for licensing and monitoring radiological sources. <p>(* - Refers to Nuclear Power Plant related Incidents.)</p>
Louisiana Poison Center (LPC)	<ul style="list-style-type: none"> • Oversees the Louisiana CHEMPACK distribution program. • Provides training, such as Advanced HazMat Life Support (AHLS) to clinicians and health and medical response partners statewide. • Manages the 1-800 poison hotline and provides the subject matter guidance on reported and suspected exposures to poisons, chemicals and other hazardous materials.
Louisiana State Police (LSP)	<ul style="list-style-type: none"> • Agency responsible for HazMat incident notification and coordination; includes managing the 24-hour HazMat hotline. • Coordinates with local and federal law enforcement agencies.

Partner		Planning & Response Roles
	Louisiana Dept of Transportation and Development (LADOTD)	<ul style="list-style-type: none"> • Offer transportation resources when requested for people without vehicles during an evacuation. • Partners with LSP to manage and monitor evacuation routes.
Federal Partners	Federal Bureau of Investigation (FBI)	<ul style="list-style-type: none"> • Assumes command over events suspected or determined to be acts of terrorism. • Provides regional and state training for radiologic risks, planning and mitigation strategies through subject matter expertise for counterterrorism efforts. • Leads Nuclear and Radiological Counterterrorism Unit (NRCU) and the Nuclear & Radiological Transportation Security Initiative (NRTSI), to monitor entities that transport Category 1 and 2 radiologic sources.
	Nuclear Regulatory Commission (NRC)	<ul style="list-style-type: none"> • Licenses and monitors all users of radiologic and nuclear material. • Co-regulates transport of radiologic material with US Department of Transportation. • Manages the National Source Tracking System (NSTS) – computer system that tracks high-risk radioactive sources through the entire life cycle. • Maintains a network of Regional State Liaison Officers who help to communicate incidents and manage notifications to relevant stakeholders.
	Center for Disease Control (CDC)	<ul style="list-style-type: none"> • Provide public health planning information including public risk communication and shelter operations resources. • Published <i>Radiation Response Briefing Manual: A Guide for Key Leaders and Public Health Decision Makers</i>. • Manages the Strategic National Stockpile (SNS) which includes pharmaceuticals, such as KI and DTPA, that could be requested for treatment during a radiologic terrorist attack.
	Administration for Strategic Preparedness and Response (ASPR)/U.S. Department of Health and Human Services (HHS)	<ul style="list-style-type: none"> • Coordinates and leads federal CBRN preparedness from a medical countermeasures perspective leading the Public Health Emergency Countermeasures Enterprise (PHEMCE). • HHS Regional Emergency Coordinator (REC) can assist with routing requests for resources and information from federal programs or other states. • Manage the Radiation Emergency Medical Management (REMM) website intended to provide guidance for healthcare providers about clinical diagnosis and treatment of radiation injuries during radiologic/nuclear emergencies.
	Federal Emergency Management Agency (FEMA)/Department of Homeland Security (DHS)	<ul style="list-style-type: none"> • Participates in state planning and exercises for radiologic events. • FEMA manages the Radiologic Operations Support Specialist (ROSS) program; a state and local subject matter expert program available during hazardous radiological preparedness and response operations – provides critical information to responders, EM officials and decisions makers. • DHS jointly staffs the Domestic Nuclear Detection Office to help prevent terrorism through expanded capabilities to deter, detect and respond to attacks
	National Nuclear Security Administration (NNSA)	<ul style="list-style-type: none"> • Oversees the Office of Radiological Security (ORS), which coordinates with local jurisdiction partners and industries to protect radioactive sources used for medical, research, and commercial purposes including the removal/disposal of disused radioactive sources. • Maintains the Nuclear Emergency Support Team (NEST) and the Radiologic Assistance Program (RAP) – both comprised of SMEs and may be deployed to incidents.
	Environmental Protection Agency (EPA)	<ul style="list-style-type: none"> • Publishes Protective Action Guides (PAGs) to assist in planning for an accident at a fixed nuclear facility inclusive of dose responses and protective actions for public and emergency workers. • Assist with guidance for response in phases - early, intermediate, and late. • Assist with communication of risks during emergencies. • Helps with monitoring and deployment of resources, including Radiological Emergency Response Teams (RERT). • Provide comprehensive radiation laboratory services along with scientific support for incident management and technical assistance for clean-up.

Partner		Planning & Response Roles
	Radiation Emergency Assistance Center/Training Site (REAC/TS)	<ul style="list-style-type: none"> Provides 24/7 emergency response and subject matter expertise on the medical management during radiation emergency incidents. Provides guidance for the NNSA's Office of Counterterrorism and Counterproliferation.
	Other National Professional Organizations	<ul style="list-style-type: none"> Oak Ridge Institute for Science and Education (ORISE) Health Physics Society (HPS) American College of Radiology (ACR)

Operational Mission Areas

Logistics

Pre-Hospital Considerations

On-scene information gathering will be critical to guide Incident Command and operations.

- Incident Command will be established according to procedures of responding entity or in accordance with local plan activation.
- Law enforcement may be involved if a suspected terrorist incident prompting response partners on scene to follow forensic guidance – this may impact routine processes for patient triage and decontamination.
- Environmental assessment will involve partners focused on operations that may not directly impact the screening and on-scene clinical care of patients.
- Triage including radiation screening and basic decontamination operations may involve local health and medical response partners including public health response coordinators, regional medical directors, EMS providers and radiologic safety officers.
- Resources for both environment and clinical surge/triage/screening operations may be included in local or organizational level plans, however additional resources should be requested through Incident Command on scene, through local parish offices, or directly to state or federal partners through GOHSEP. Immediate resource requests may include:
 - Wrap around services for community reception sites or evacuation shelters.
 - Decontamination supplies
 - PPE and protective equipment for responders and citizens
 - Scene management equipment, such as signage and cones or barriers
 - Detection equipment
 - Support for the distribution of KI or other countermeasures.

Community Reception Activities

- The LPRRP includes community reception and evacuation response activities in communities nearby nuclear power plants.
 - These plans address pet sheltering, decontamination recommendations, population-based screening procedures, and countermeasures distribution criteria.
 - Each Plan outlines pre-identified sites and entities to be used for community reception activities.
- Community reception sites and/or evacuation shelters may be set up for other large scale radiologic emergencies.
- Public screening and initial triage may be established by local first responders, EMS, HazMat teams, and other radiation response experts.
- Parishes, state agencies and Emergency Support Functions (ESFs) may have specific plans that can be activated to support community reception or evacuation activities. These include:
 - Parish OHSEPs will conduct shelter operations, establish community reception sites or activate evacuation plans, and activate hazardous materials response teams and supplies.
 - DCFS (ESF-6) may provide shelter support to local shelters.
 - LSP may provide traffic control and evacuation support.
 - DOT maintains evacuation contracts for buses may be activated and used to move citizens.
 - LDH/OPH (ESF-8) may activate Point of Dispensing (POD) plans for distribution of medical countermeasures; activate shelter plans to support evacuated vulnerable or medical populations.

- ESF-8 Network partners of state and regional coordinators will support information sharing to healthcare partners to assist with sheltering-in-place orders, continuity of operations, and routing resource requests from impacted local partners.

Detection

Rapid detection is essential for providing an effective, timely response to screen and treating exposed persons as well as prevent further exposure or contamination to citizens and responders. Detection equipment may be organic to some industry partners or incorporated in emergency response planning for organizations. Geiger counters and personal dosimeters are common examples of basic, portable detection equipment that could be easy to source and deploy. However, not all detection equipment can be used in all exposure incidents – the type of detection equipment needing to be obtained will be determined by the type of radiation involved in the incident.

In Louisiana, radiation detection equipment may be found among the following partners:

- Parish Offices of Homeland Security and local Fire Departments or HazMat teams.
- Hospitals with nuclear medicine departments.
- Industry partners including nuclear power facilities.
- LANG, CERFP
- GOHSEP, PRND program
- LADEQ
- Other state agencies and federal partners may have caches or vendor lists that can be sourced.

Hospital and other industry RSOs along with regional, interstate, and intrastate SMEs may be consulted to assist with identification and outreach to external entities that store or have access to equipment most useful for first responders, EMS, and hospitals. A WebEOC request may be placed through parish OHSEPs or the state to source the equipment and/or expertise needed.

Medical Care & Treatment

This section will outline key response functions of the ESF-8 Network and HCC leads in supporting hospitals with clinical evaluation, triage, and treatment by both pre-hospital providers (EMS) and hospital ED clinicians who may receive patients from the scene of an incident.

Health Risks

One of the greatest health risks of concern in radiologic incidents is the biochemical reaction that may occur to the human body resulting in DNA and/or cellular damage from ionizing radiation. Diagnosing and treating radiologic health conditions are of greatest concern for clinicians responding to a radiation emergency.

Acute Radiation Syndrome (ARS) is categorized in 4 subsyndromes of radiation injury with corresponding symptoms and 4 time-related stages. The subsyndromes are factors of the amount of penetrating dose received, time dose was experienced and radiosensitive tissues exposed. Subsyndromes are:

- Hematopoietic Subsyndrome – effects of radiation damage to radiosensitive blood producing systems and tissues evidenced by declining white blood cell counts resulting in infection and possible hemorrhage. The hematopoietic subsyndrome effects are generally seen after a 1 Gray/100 Rads total body exposure. Given appropriate therapies patient survival is probable.
- Gastrointestinal (GI) Subsyndrome – effects of radiation damage to radiosensitive gastrointestinal tissues. Along with the hematopoietic subsyndrome, symptoms now include nausea, vomiting, anorexia, possible bloody diarrhea and sepsis. GI subsyndrome effects are seen after a 6 – 8 Gray/600 – 800 Rads total body exposure. Given appropriate therapies and resources patient survival is possible.
- Neurovascular (NV) Subsyndrome – Is always fatal and results from damage to the circulatory system including endothelial blood vessel leakage and increased intracranial pressures leading to coma and death. The NV subsyndrome is seen after 20 Gray / 2000 Rad total body exposure.
- Cutaneous Radiation Injury Subsyndrome – a variety of localized skin and tissue epilation and burns which are radiation dose and exposure time dependent.

The four time-related stages of ARS include:

- Prodromal - Initial symptoms for this stage depending on the radiation dose are nausea, vomiting, anorexia, diarrhea and/or cognitive impairment which may occur minutes to days post exposure.
- Latent - Follows the prodromal phase and lasts for a few days to 2-3 weeks depending on total dose. During this time the patient may feel healthy but white blood cells are declining.
- Manifest Illness (Critical Phase) - The period when overt illness develops – pneumonia, severe leukopenia, sepsis, epilation, etc. with symptoms reflecting the corresponding ARS subsyndrome.
- Recovery or Death

Transport

- EMS entities responding to an event will utilize triage screening procedures per normal protocols and prioritize routing patients with severe injury or illness, such as trauma.
- EMS entities will refer to decontamination procedures and utilize the advised protective equipment for the known sources and exposure methods involved in the incident.
- Specific EMS agencies are pre-identified in the LPRRP and follow specific procedures outlined within their plans during incidents at a nuclear facility.
- For events requiring a surge of EMS units to transport contaminated or potentially contaminated patients, EMS agencies will first activate mutual aid agreements.
- An EMS Designated Regional Coordinator (DRC) may request additional resources from outside the region by neighboring DRCs or request to activate state surge contracts for EMS units when local resources are overwhelmed.
- Hospital transport contracts with EMS agencies may be needed to assist with the transport of patients from a Tier 1 hospital in Louisiana to a Radiation Injury Treatment Network (RITN) facility.
- EMS providers may need to treat patients with ARS in different phases of their illness being transported in-state or out-of-state.

Decontamination

Patients may be exposed and contaminated with radioactive material following an incident. Those patients who have been appropriately screened and found contaminated should be decontaminated. Decontamination during radiologic incidents is often not an emergency, unlike with chemicals. It is important that the patient is triaged first as the focus should be to perform immediate, life or limb saving actions ensuring that decontamination does not interfere with medical care. Hospitals may need to activate plans for inside and outside facility decontamination operations. Appendix D outlines the hospitals across the state with decontamination teams trained on radiation decontamination.

Decontamination Priorities

- 1) Wounds – decontaminate intact areas surrounding wounds and prepare to irrigate and debride as necessary.
- 2) Body orifices around the face – monitor that the process to decontaminate orifices does not risk forcing more radioactive material into the body; simple processes can be used such as blowing nose and irrigating eyes.
- 3) Intact skin – basic decontamination with baby-wipes is effective and limits waste; When more aggressive steps are needed to remove the contamination, soap and gentle scrubbing are suggested.

Decontamination Considerations

- Remove and bag the patient's clothing and personal belongings (this typically removes 80 - 90% of contamination).
- Use decontamination techniques to minimize spreading areas of contamination, particularly during dry decontamination or when using baby wipes.
- When using water, runoff should be sequestered and disposed of appropriately.
- Handle foreign objects with care until proven non-radioactive with survey meter.

Hospitals may have existing hazardous medical waste contracts that can be utilized to manage and dispose of radiation contaminated waste. Hospitals whose contractors do not manage radiologic waste or waste that's produced in the field at the scene of an incident may request guidance from other hospitals in the region, local HazMat teams, and parish or state officials to assist with identification of vendors who may support waste disposal.

Medical Triage and Assessment

- EMS responders and Emergency Department clinicians should triage and treat according to life threatening injuries or illnesses, such as combined trauma injuries.
- Understanding exposure details including sources, doses, injury types, pathways, and any other incident specifics will assist ED staff and clinicians with determining appropriate treatment.

Note: If exposure dose is high enough, the source is not as relevant. The illness presentation will be the same, resulting in ARS.

Treatment

- Treatment protocols and procedures for ARS and CRI can be found on the REMM and ORISE websites.
- Providers may focus on identification of the four types of radiation induced injuries as outlined in Advanced Hazmat Life Support (AHLs):
 - 1) Injury by way of external irradiation, whole or partial-body exposure
 - 2) Contamination by radioactive materials – external, on the skin; internal, inhaled, swallowed, absorbed through skin or wounds.
 - 3) Incorporation of radioactive materials – into the body, cells, tissues, or organs such as bones, kidneys, liver, etc.
 - 4) Combined radiation injury – any of the above injuries in conjunction with trauma.
- Clinicians will use information shared about the exposure dosage to classify patients to determine the survivability of radiation casualties.
 - Survival probable < 1Gy (<100 Rads)
 - Survival possible 2-8 Gy (200-800 Rads)
 - Survival improbable > 8 Gy (>800 Rads)
- Some Electronic Health Records systems, such as EPIC, have ARS treatment medical orders developed by RITN for clinicians to access.
- Clinicians experiencing challenges with determining treatment procedures may consult with health experts or providers.
 - The DRC or ESF-8 network can assist with identification and coordination of such guidance outlined in the *Hospital Surge Strategies – Staffing* section.
- Laboratory and pharmaceutical services may be in high, prolonged demand for the continuous evaluation and management of patients with known or suspected ARS.
- A variety of clinical supplies may be necessary to manage and treat patients with ARS including laboratory supplies, blood and blood by-products, bone marrow, and pharmaceuticals. The *Supplies* section under *Hospital Surge Strategies* outlines specifics of various pharmaceuticals needed.
- Casualties presenting where survivability is improbable may prompt clinicians to offer palliative/comfort care measures for end-of-life.
- The state's *Framework for Mitigating Crisis Environments: Crisis Standards of Care Guidance and Resources for Hospitals* may be referenced when there are shortages of available beds and resources to treat patients. The components of this plan may help guide hospitals with internal decision-making considerations as well as guide response recommendations when multiple facilities or regions are impacted, and statewide resources are maximized.
- In absence of clinical SME's, physicians can be directed to online algorithms posted to the REMM website choose appropriate methods to assist with evaluation for radiation contamination and/or exposure. REMM includes specific clinical management modifiers that should be considered and may assist EMS providers and hospital ED physicians with treating concomitant injuries.

Hospital Surge Strategies

The ESF-8 Network Coalition Response Plan, HCC Regional Preparedness and Response Plans, along with supplemental HPP Grant resources and supplies tracking documents outline key functions and methods used to assist hospitals with surge activities for all-hazards events. Individual hospitals are responsible for maintaining all-hazard response plans that will outline internal resources, teams, and emergency procedures to use during response to events. This section is intended to outline the anchored components of surge response operations within hospitals in context of radiologic emergencies.

Staff

- Staff understand the facility response plan and individual roles in responding to a radiologic event.
- Hospital incident command system (HICS) outlines roles and responsibilities of clinical and non-clinical personnel during an event. Some of the roles that will need engagement and guidance for the duration of a radiologic emergency may be:
 - Clinical
 - Pharmacists
 - Radiation Oncologists.
 - Specialists – OBGYN, pediatrics, burns.
 - Mental Health
 - Laboratory Staff including phlebotomists.
 - Non-clinical/Ancillary
 - Housekeeping and dietary staff
 - Communications/Public information officer (PIO)
- Clinicians understand where to obtain guidance for clinical treatment protocols.
 - Expert clinicians in the hospitals are pre-identified and serve as medical technical specialists in the incident command structure.
 - Expert clinicians in the region or HCC may be pre-identified and requested to serve as consulting medical specialists to hospitals without internal expertise.
 - Health physicist and clinical consultation through the Radiation Injury Treatment Network hospitals (RITN)
 - REAC/TS hotline or other national organizations with clinical representation for engagement.
- Training resources specific to radiologic emergencies may be supplied to staff in the following methods:
 - During routine all-hazards planning workshops or exercises.
 - In anticipation of a known threat or event.
 - At the time of an event, through just-in-time training by way of verbal guidance by health physicist, lead clinician, or in consultation with an interstate or intrastate clinical health professional.
 - Online resources are available in real-time and include algorithms, videos, and fact sheets for use by providers.
- Decontamination teams understand the decontamination priorities and principles relevant to radiological decontamination.
 - Just-in-time (JIT) training and decontamination guidance will be shared by incident command staff in collaboration with subject matter experts from the scene or medical technical specialists within the facility.
 - Staff in clinical areas inside the facility where decontamination may need to occur *after* life threatening injuries are treated, such as operating rooms, may need to be advised on appropriate PPE levels and JIT training for decontamination procedures after patient stabilization.

Space

Emergency Department considerations

- External facility decontamination space that accounts for contingencies based on weather conditions.
- Internal facility decontamination area.
- Separate patient screening area for the uninjured.
- Signage to direct patients and EMS to proper screening/decontamination areas separate from routine ED traffic flow.

Bed Availability/Transfer considerations

- Hospitals will identify the ability to provide care and treatment to patients received.
- Hospitals will work through existing mechanisms to transfer patients needing higher levels of care outside of their facility. This includes transferring to centers with specialty services, such as Pediatrics and Burn.
- Hospitals may contact the DRC network or LERN to assist with identifying available beds for patients needing to be transferred if routine mechanisms are ineffective or they become overwhelmed.

- LERN and the DRCs will use the ESF-8 Portal, Resource Management screen to identify available beds by type and critical services available.
- Hospitals and the DRCs will use the *At-Risk Registry* to track patients.

Specialty Facilities

Radiation Injury Treatment Network (RITN): No hospital in Louisiana participates in the RITN. However, the ESF-8 network may assist clinicians or hospitals with connecting with an RITN facility. Large-scale radiation emergencies may also prompt the activation of the National Disaster Medical System (NDMS) and the movement of decontaminated patients into the RITN through Federal Coordinating Centers (FCCs).

Some Louisiana hospitals do offer therapies that are consistent with the treatments offered by RITN hospitals, such as bone marrow transplants. These hospitals may be activated early in response to provide guidance and utilized for inter-state patient movement and coordination.

Burn Hospitals: Burn beds may be needed for treating patients with severe cases of CRI or who have burn/blast injuries. The *State's ESF-8 Burn Surge Annex* outlines the key response functions and coordination mechanisms between the four Louisiana burn hospitals and the triggers for activating the Southern Region Burn Call Center during a disaster involving a surge of burned patients.

Pediatric Hospitals: Pediatric beds and services may be necessary to assist with treating pediatric patient casualties from a radiologic emergency. The state's *ESF-8 Pediatric Surge Annex* highlights the methods in which the ESF-8 network will support pediatric surge into hospitals with existing pediatric capabilities and capacities.

Supplies

Both pharmaceuticals and PPE are essential supplies that will be in demand during and radiologic emergency. During emergencies presenting a surge of ill/injured patients with ARS or CRI, pharmaceuticals will be of utmost importance. Access to and proper use of PPE to protect responders providing care and assisting with decontamination will also be a priority. Basic decontamination equipment is typically maintained by larger acute care (Tier 1) hospitals. However, supplemental resources may be requested by local HazMat teams, fire departments, or through the DRC network.

Pharmaceuticals

The pharmaceuticals, countermeasures, or therapeutics commonly associated with treating patients from a radiologic emergency may not be routinely stocked in a hospital pharmacy. As soon as the radioisotope is identified, providers should consult with a health physicist to determine treatment protocols. Health physicists may be internal to the hospital, from another hospital within the HCC or state, or external to state by way of REAC/TS or through RITN.

Once obtaining guidance on appropriate pharmaceuticals needed to treat patients, hospitals may take the following steps to source medication that are not routinely carried or become in short supply:

- Contact existing pharmaceutical vendor.
- Make a direct request from another regional hospital or HCC member with known supply.
- Contact the DRC to assist with obtaining from HCC partners internal or external to the region.
- Request assistance to obtain through REAC/TS hotline or other response organization who has stockpiled resources or can make a vendor recommendation.
- Make request to State to request from the Federal SNS.

Local and state stockpiles of *some* countermeasures may be available for distribution, however for larger scale emergencies, national stockpiles will be most suitable. It is important to account for the anticipated delay in both requesting SNS resources and the actual receipt of the resource. Working with parish and state emergency management officials, in collaboration with ESF-8 network DRCs to collect essential elements of information will assist with expediting the request process.

A 2023 World Health Organization (WHO) policy advice document outlines international stockpiled medical countermeasures applicable to four distinct radiation emergency scenarios involving specific isotopes. This document provides context of the

emergency scenarios along with suggested stockpile formularies including dosing/duration, effect, among other factors that will need to be considered by providers when prescribing for use.

- Ca and Zn Diethylenetriamine pentaacetate (DTPA) – used as a therapy for removing a variety of trans uranium elements from the body.
- Prussian blue – used as a therapy to treat inhalation or ingestion exposures of certain radionuclides by absorbing the contaminant for removal from the body.
- Potassium Iodine (KI)* – only used to provide protection against radioactive iodine, caused by a nuclear event.
- Antibiotics and antivirals may be needed to treat or prevent hospitalized ARS patient infections.
- Antiemetics may be needed to treat nausea/vomiting in patients with ARS.

*The LPRRP outlines the suggested dosages, recommendations, and processes for obtaining KI after an event. Only a small amount of KI is stockpiled by LA ESF-8 for distribution, primarily in settings where individuals may not be able to evacuate quickly and safely – i.e. hospitals, nursing homes and prisons.

Decontamination and Protective Equipment

- Detection equipment needed will be determined by the type of radiation involved. Multiple types and sources of detection equipment exist that may be maintained by the hospital or sourced through partners external to the hospital.
- Adequate equipment will be needed for decontamination both inside and outside of the hospital(s).
- Determine appropriate healthcare Personnel Protection Equipment (PPE) – for most radiologic responses this will be basic level PPE.
 - Determined based on role and specific tasks.
 - Internal vs. external contamination of patient(s).

Deactivation and Recovery

- Discussions to determine deactivation procedures after a radiologic emergency will occur when initial responses to screen, triage, decontaminate, and route injured patients needing medical care has concluded.
- The ESF-8 Network will continue to support healthcare coalition members who activate their COOP plans until they return to normal operations.
- The ESF-8 Network will collaborate with regional partners, including individual EMS and hospitals who treated patients to reconcile reports of patient casualties from the event.
- Public health partners may coordinate with local authorities to reconcile reports of citizens screened and decontaminated for future monitoring.
- For communities evacuated, re-entry and returning to homes and businesses will be guided by local authorities; hospitals in these areas will follow instruction of local authorities.
- Public health partners may be consulted to provide support with setting up longer-term screening programs once the re-entry/return phase occurs.
- Ongoing investigations may be anticipated by law enforcement requiring continued cooperation by health and medical response partners.
- Recovery from large scale radiologic or nuclear events may take months to years.
- The health and medical deactivation and recovery may not align with the timeframe for environmental recovery which will involve EPA and LaDEQ, among other agencies and partners.
- Long-term tracking of patients with ARS, CRI, or other injuries because of the event may be expected among Louisiana healthcare systems and public health partners.
- ESF-8 will participate in or host After Action Reviews (AARs) of response activities to assess plan viability, identify opportunities, and address gaps where possible.

Special Considerations

Behavioral Health

The mental health demands caused by fear during a radiologic emergency should be anticipated by planners and responders. Hospitals who treat patients impacted by radiation injuries have case management and behavioral health teams to treat the immediate behavioral health needs of the patients in their care. However, for the long-term behavioral health impacts on patients, citizens, and responders, a multitude of mental health professionals will be essential. Healthcare coalitions may leverage out-patient providers, both primary care and local mental health services to assist with conducting assessments, providing psychological first aid, and treating any long-term effects caused by the event. The state Office of Behavioral Health (OBH) has programs that may also be leveraged to assist with meeting the demands of behavioral health needs, in the short-term and long-term. Additional resources are available for access on the REMM website.

Consequence Management of “Worried Well”

Local officials as well as front-line providers should account for responding to masses of worried well citizens presenting at community reception sites, hospitals, and healthcare facilities. The implications of managing a surge of “worried well” citizens in the healthcare setting have proven not only costly, but also interrupts the operations of a hospital during a critical time (Carter and Kearns - ESF-8 Lunch and Learn Webinar, October 2022). Effective communication will be essential to help manage the influx of anticipated “worried well”. These communication strategies and considerations can be found in the *Crisis Communications* section.

Vulnerable Populations

Planning resources can be found in abundance for two specific populations – pediatrics and pregnant women. The health impacts and perceived effects of radiologic exposure on these sub-groups of citizens and patients is of great concern to planners, responders, and clinicians prompting longer term monitoring. The REMM website provides resources and for consideration when evaluating these unique populations and may be used in conjunction with consulting local specialists to inform care and treatment of these populations.

- Pediatrics - Exposure rates and dosages to various ages of children should be considered.
- Pregnant women – Exposures can cause birth defects in fetuses.

Using planning tools such as the Social Vulnerability Index (SVI), EmPOWER data, and the FEMA toolkit including GIS mapping has allowed planners to identify other groups of citizens that may be considered in this type of event. Some of these population subgroups are outlined in state all-hazards plans, ESF-8 HCC plans, and may be addressed in hospital plans.

- Home bound citizens who may be unable to evacuate without assistance and may have specific medical needs at home, such as oxygen or other electrical dependencies.
- Non-English speaking, hearing and/or visually impaired citizens who may need to receive critical information distributed to communities as well as be able to correspond with responders and clinicians in a hospital.
- Populations without transportation may not seek medical care or will utilize EMS for access to medical care.

Crisis Communication

Due to uncertainty, unfamiliarity, and perceived risk of radiologic exposures resulting in fear, effective crisis communications plans and strategies may be considered one of the most important components of response to a radiologic emergency. The ESF-8 network, including the LDH Bureau of Media and Communications (BMAC) may be essential partners in assisting GOHSEP and local jurisdictions with preparing a unified message for distribution. Events occurring at nuclear facilities will have formalized Joint Information Centers (JICs) and will be set up to coordinate information and publish pre-scripted press releases to help communicate with the public, jurisdictions, and healthcare facilities within impacted areas. For events involving Riverbend Station and Waterford 3, the JIC will be established at GOHSEP in Baton Rouge, LA. However, for an emergency at Grand Gulf Station, the JIC will be located at Mississippi Emergency Management Agency (MEMA) in Pearl, MS.

Many parishes, HCCs, and other emergency management response partners have communications plans that outline staff, such as Public Information Officers (PIOs), responsible for collecting and sharing information on behalf of the organization during emergencies. The inclusion of subject matter experts to help advise on messaging surrounding continued threats and

protective measures will be critical during a radiologic emergency. It may be plausible that messaging will need to be geared towards two audience types – for the public and for responders.

Public Communications: This messaging will be necessary to help provide accurate information to the public in an understandable way.

Responder Communications: This messaging may be necessary to help provide accurate information to the responder community to minimize confusion, dispel misinformation, and provide an overall level of certainty that they are safe to continue responding in their roles. This may include workers at community reception sites, first responders (EMS, Fire, Law Enforcement), and hospital staff – both clinical and non-clinical. The ESF-8 network will assist in directing and sharing current information to their HCC members to assist with messaging to this group.

Appendix E outlines some of the communications principles and considerations of greatest relevance for healthcare facilities during radiation emergencies.

Fatality Management

Hospitals may be expected to notify state or federal authorities that patients have expired due to illnesses resulting from exposures during a radiologic incident. During events where the decedent is known or suspected to be contaminated, the hospital morgue staff may be issued appropriate PPE and dosimeters if necessary. Any deceased patient surveyed and determined to be contaminated, whether internally or externally, should not be cremated as doing so could spread contamination. Events resulting in large numbers of deceased citizens may trigger the activation of the State *ESF-8 Mass Fatality Plan*. This plan provides a framework for how the state will collaborate with local coroners to manage an event in which handling, storage, and ultimate disposition of human remains will need to be coordinated.

Glossary & Acronyms

AAR-After Action Review

ACR-American College of Radiology

ADRCs – Administrative Designated Regional Coordinator

AHLS-Advanced Hazmat Life Support

ARS-Acute Radiation Syndrome

ASPR-Administration for Strategic Preparedness and Response

BEMS-Bureau of Emergency Medical Services

BMAC-Bureau of Media and Communications

CBRN(E)-Chemical, Biological, Radiological, Nuclear, and Explosive

CDC-Center for Disease Control

CERFP-Chemical Enhanced Response Force Package

COOP-Continuity of Operations Plan

CRI-Cutaneous Radiation Injury

CST-Civil Support Team

DCFS-Department of Children and Family Services

DEQ-Department of Environmental Quality

DHS-Department of Homeland Security

DNA-Deoxyribonucleic Acid

DNDO-Domestic Nuclear Detection Office

DRC – Designated Regional Coordinator

DTPA-Diethylenetriaminepentaacetic Acid

ED-Emergency Department

EM-Emergency Management

EMAC-Emergency Management Assistance Compact

EMS – Emergency Medical Services

EMS DRC-Emergency Medical Services Designated Regional Coordinator

EPIC-Epic Systems, Corporation

EOC-Emergency Operations Center

EPA-Environmental Protection Agency

ESF – Emergency Support Function

ESF-2 – Communications function

ESF-6-Mass Care, Emergency Assistance function

ESF-8 – Health and Medical Response function

EWMDS-Emergency Worker Monitoring and Decontamination Station

FBI-Federal Bureau of Investigation

FEMA-Federal Emergency Management Agency

FQHCs-Federally Qualified Health Centers

GIS-Geographic Information System

GOHSEP–Governor’s Office of Homeland Security and Emergency Preparedness

Gy- Gray; absorbed dose, international unit of measure

HazMat-Hazardous Materials

HCC-Healthcare Coalition

HHS-Department of Health and Human Services

HICS-Hospital Incident Command System

HPS-Health Physics Society

IAEA-International Atomic Energy Agency

ICS-Incident Command System

IND-Improvised Nuclear Devices

JCAT-Joint Counterterrorism Assessment Team

JIC-Joint Information Center

JIT-Just in time

KI-Potassium Iodide

LDEQ-Louisiana Department of Environmental Quality

LaDEQ-Louisiana Department of Environmental Quality

LADOTD-Louisiana Department of Transportation and Development

LANG-Louisiana National Guard

LDH – Louisiana Department of Health

LERN – Louisiana Emergency Response Network

LHA-Louisiana Hospital Association	PRND-Preventive Radiological/Nuclear Detection Program
LPRRP-Louisiana Peacetime Radiation Response Plan	Rad – absorbed does; US unit of measure
LSP-Louisiana State Police	RDD-Radiological Dispersal Devices
NCTC-National Counterterrorism Center	REAC/TS-Radiation Emergency Assistance Center/Training Site
NNSA-National Nuclear Security Administration	REC-Regional Emergency Coordinator
NRC-Nuclear Regulatory Commission	RED-Radiological Exposure Devices
NRCU-Nuclear and Radiological Counterterrorism Unit	REMM-Radiation Emergency Medical Management
NRTSI-Nuclear and Radiological Transportation Security Initiative	RERT – Radiological Emergency Response Team
NSTS-National Source Tracking System	RITN-Radiation Injury Treatment Network
OBH-Office of Behavioral Health	RMD-Regional Medical Director
OEP-Office of Emergency Preparedness	ROSS-Radiologic Operations Support Specialist
OHSEP-Office of Homeland Security and Emergency Preparedness	RSO-Radiation Safety Officer
OPH-Office of Public Health	SHO-State Health Officer
ORAU – Oak Ridge Associated University	SME-Subject Matter Expert
ORISE-Oak Ridge Institute for Science and Education	SMRAP-Southern Mutual Radiation Assistance Plan
ORS-Office of Radiological Security	SNS-Strategic National Stockpile
PAGs-Protective Action Guides	SVI-Social Vulnerability Index
PHEMCE-Public Health Emergency Countermeasures Enterprise	TAG-The Adjutant General
PHERC-Public Health Emergency Response Coordinator	TOC-Tactical Operations Center
PIO-Public Information Officer	UCG-Unified Command Group
POD-Point of Dispensing	US-United States
PPE-Personal Protective Equipment	WebEOC-The Web Emergency Operations Center
	WHO-World Health Organization
	WMD-Weapon of Mass Destruction

A more comprehensive glossary can be found on the ORISE/REACTS website

<https://orise.orau.gov/resources/reacts/documents/radiological-terms-quick-reference.pdf>

Appendices

Appendix A: Louisiana Licensed Sources, Applications and Categories

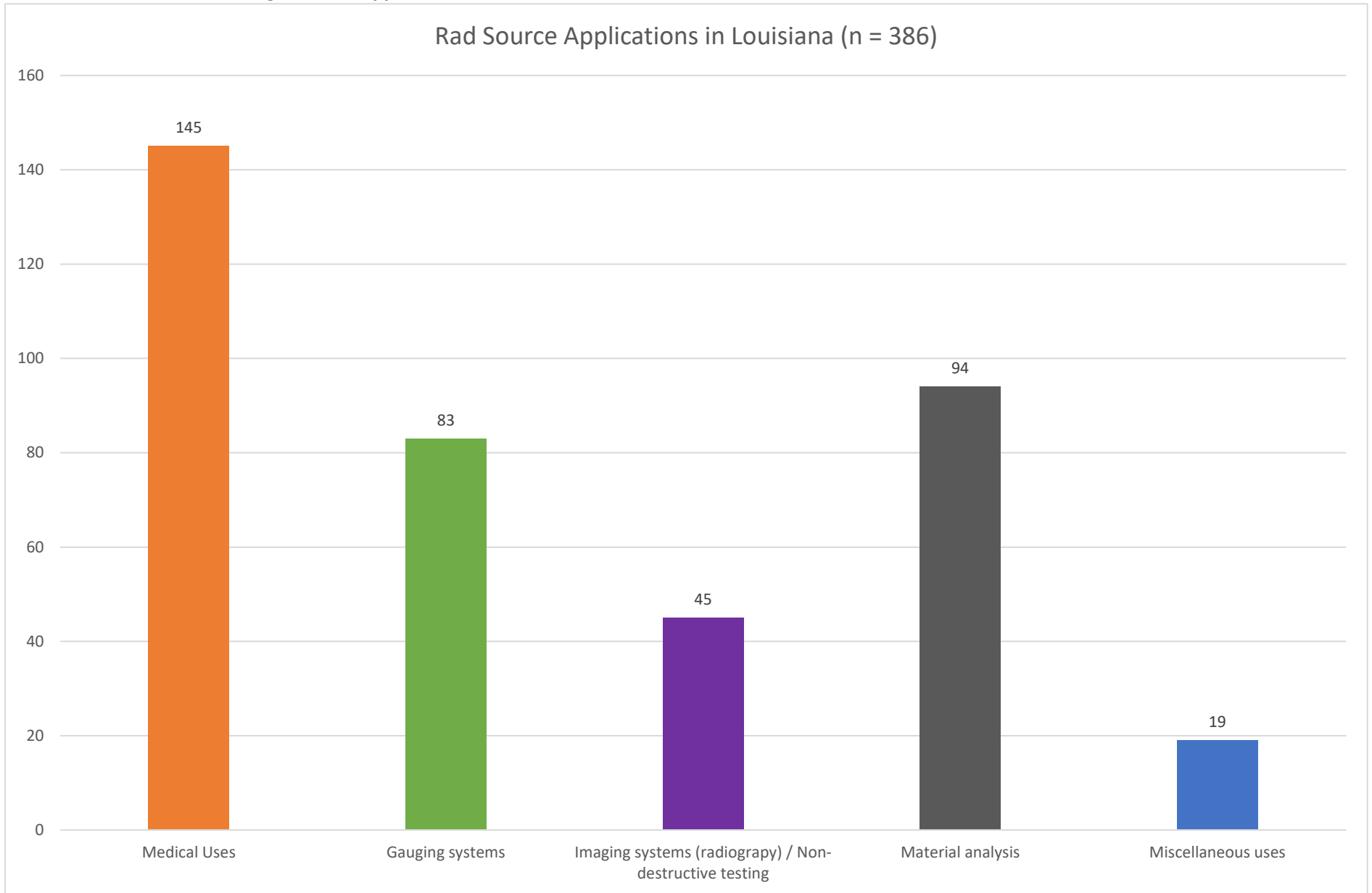
Appendix B: FBI Toolkit/IAEA Source Categories

Appendix C: Louisiana Licensee Sites that Ship; Louisiana Interstates that Ship Cesium-137

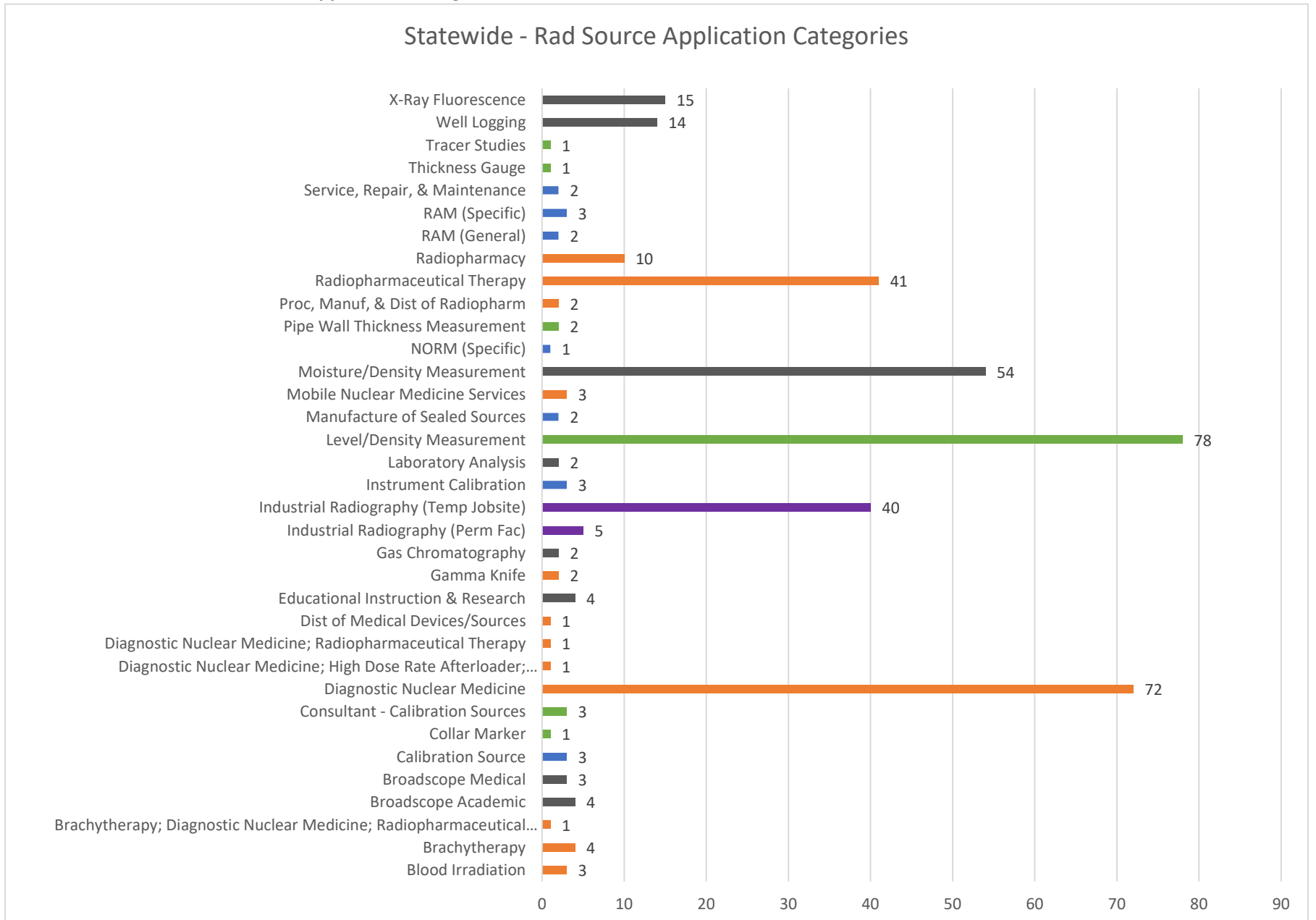
Appendix D: Tier 1 Hospital Capabilities Survey Findings, March 2023

Appendix E: Radiation/Nuclear Crisis Communications for Healthcare Coalition Members

Louisiana Statewide - Radiologic Source Applications



Louisiana Statewide – Rad Source Application Categories



FIRSTRESPONDERSTOOLBOX

NCTC

RADIOLOGICAL THREAT AWARENESS

WARNING: Legitimate products containing radioactive material are clearly labeled. Radiation detection without a clearly labeled product warrants further investigation. Report suspicious activity, as well as the theft or loss of a radiological device or materials to federal, state, and local authorities.

SOURCE CATEGORIES (CATs)

CAT 1
EXTREMELY DANGEROUS
 Fatal if close to this source for minutes to hours

CAT 2
VERY DANGEROUS
 Fatal if close to this source for hours to days

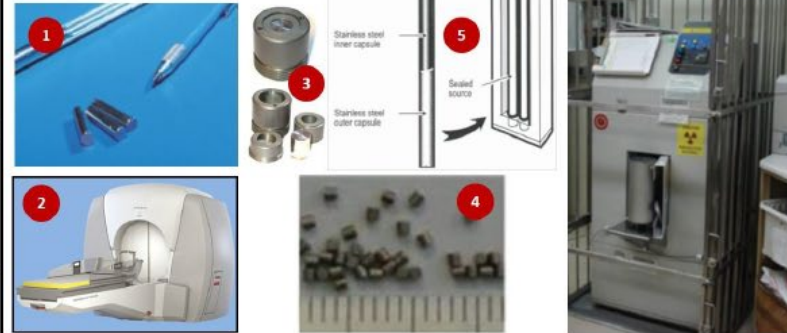
CAT 3
DANGEROUS
 Permanent injury if handle or in close contact with this source for hours

CAT 4
UNLIKELY DANGEROUS
 Temporary injury if handle this source for hours or near to it for weeks

CAT 5
MOST UNLIKELY DANGEROUS
 No permanent injury if in contact or near this source

CAT 1 SOURCES – RESEARCH AND MEDICAL

1. Source "pencil" and slugs
2. Medical Gamma Knife
3. Source holder (CAT 1 or 2)
4. Pellets
5. Source pencils
6. Blood irradiator



CAT 2 SOURCES – INDUSTRIAL AND MEDICAL

1. Gamma disks used in industrial radiography "pigtailed"
2. Brachytherapy "seeds"
3. Remote after-loading cancer treatment brachytherapy machine
4. Sealed source "pigtail"
5. Common Industrial radiography projectors



CAT 3 SOURCES - INDUSTRIAL

1. Well logging
2. Well logging source
3. Fill level measurement gauge
4. Flow/density measurement gauge



CAT 4 SOURCES - INDUSTRIAL

1. Density gauge
2. Thickness measurement gauge



CAT 5 SOURCES - COMMERCIAL

1. X-ray fluorescence analyzer
2. Self-luminous sign
3. Smoke detector



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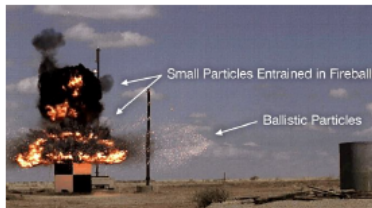
RADIOLOGICAL THREAT AWARENESS (continued)

Terrorists, criminals, and violent extremists have long expressed interest in obtaining radiological materials to conduct attacks, and it is likely that they remain interested. A radiological dispersal device (RDD) or a radiological exposure device (RED), may pose significant consequences for public safety and critical infrastructure. First responders play an instrumental role in quickly detecting and identifying a radiological hazard, triaging and treating victims, securing a scene, and mitigating further exposure. Typically, an initial response to radiation is based on secondary indicators, such as readings from specialized instruments, labels on containers, and signs or placards indicating hazardous material. A basic familiarity with the sources of radioactive materials will improve an emergency response and facilitate outreach to private-sector partners for reporting suspicious activity.

An RDD is an unconventional weapon used to disperse radioactive material. An RDD that uses explosives to disperse the materials may be referred to as a dirty bomb. The terms RDD and dirty bomb are often used interchangeably; however, RDDs include dispersal by fire and spraying.

- The main impact of an RDD is to cause panic, fear, and economic damage rather than casualties.
- The spread of the radiological material in an RDD depends on the method used. An RDD is an area denial weapon, a weapon of mass disruption, where the affected area is evacuated until contaminated zones are cleaned up.
- The main danger from a dirty bomb comes from the explosion, not the radiation. People who are very close to the blast site are more likely to be injured or killed because of the immediate trauma from the blast.
- RDDs would be unlikely to cause immediate, radiation-related fatalities. People close to the blast from an explosive RDD could receive a radiation dose from dispersed radioactive material that lands nearby or that might become lodged in their bodies.
- The radioactive dust and smoke caused by the explosion can spread farther by atmospheric flow and may be dangerous to health if inhaled, or if an individual consumes contaminated food or water in high enough concentrations.

RADIOLOGICAL MATERIALS OF CONCERN: Hundreds of different radionuclides are used in a variety of industrial, medical, scientific research, and commercial applications, but only a small number are of serious concern for use in terrorism given their portability, relatively high levels of radioactivity, and availability. Four radiological materials of primary concern with respect to terrorism are cobalt-60, cesium-137, iridium-192, and americium-241. Radionuclides of less concern are those with minute levels of radioactivity and that are available in small quantities, including sources in smoke detectors and camping lanterns. The materials in these products would not constitute a significant dispersal or exposure hazard even if thousands were collected to recover their radioactive material.



RDDs have many potential methods of dispersal, including explosive, fire, and aerial or ground spraying.



SCOPE: This reference aid provides an awareness of radiological materials of concern that may be attractive targets for theft or sabotage by terrorists or criminals. It highlights considerations for response and additional resources.

INCIDENT-RELATED CONSIDERATIONS: First responders should always follow specific departmental policies, standard operating procedures, and established protocols in the event of a radiological incident. The following may assist first responders in their considerations:

RECOGNITION:

- Take multiple readings with different radiation detection equipment to confirm elevated radiation levels at the scene.
- Determine any localized hot spots of radiation at the scene based from the patterns of fragmentation.

NOTIFICATION:

- Notify appropriate first responders, medical facilities, neighboring jurisdictions, and federal, state, and local officials.
- Issue protective actions to the public through a unified command structure.
- Determine personal protective equipment (PPE) levels, and do not touch radioactive fragments with bare hands or store them in clothing.
- Request assistance from hazardous materials, radiological, health, Department of Energy, and FBI personnel and secure, stage, and allocate resources.

MULTIAGENCY RESPONSE:

- Conduct lifesaving rescue operations.
- Remove response personnel who may be pregnant.
- Locate, isolate, triage, and decontaminate possible exposure(s).
- Secure the area, control any remaining sources, establish a security zone and crime scene.
- Establish HOT, WARM, and COLD zones on the basis of the radiation hazard and any remaining explosive, fire, or chemical hazards.
- During the shift from lifesaving to investigation phase; preserve evidence, including placards, UN numbers, and shipping papers.

EVACUATION AND MONITORING:

- Establish evacuation routes that avoid heavily contaminated areas.
- Control utilities or other conventional water, food, and transport infrastructure.
- Observe, assess, and determine HOT zone. Limit entry to it, ensure accountability, follow PPE guidelines, assume those removed from area will need decontamination, and treat it as a crime scene.
- Perform environmental monitoring.
- Determine and secure triage and transport areas.

RESOURCES:

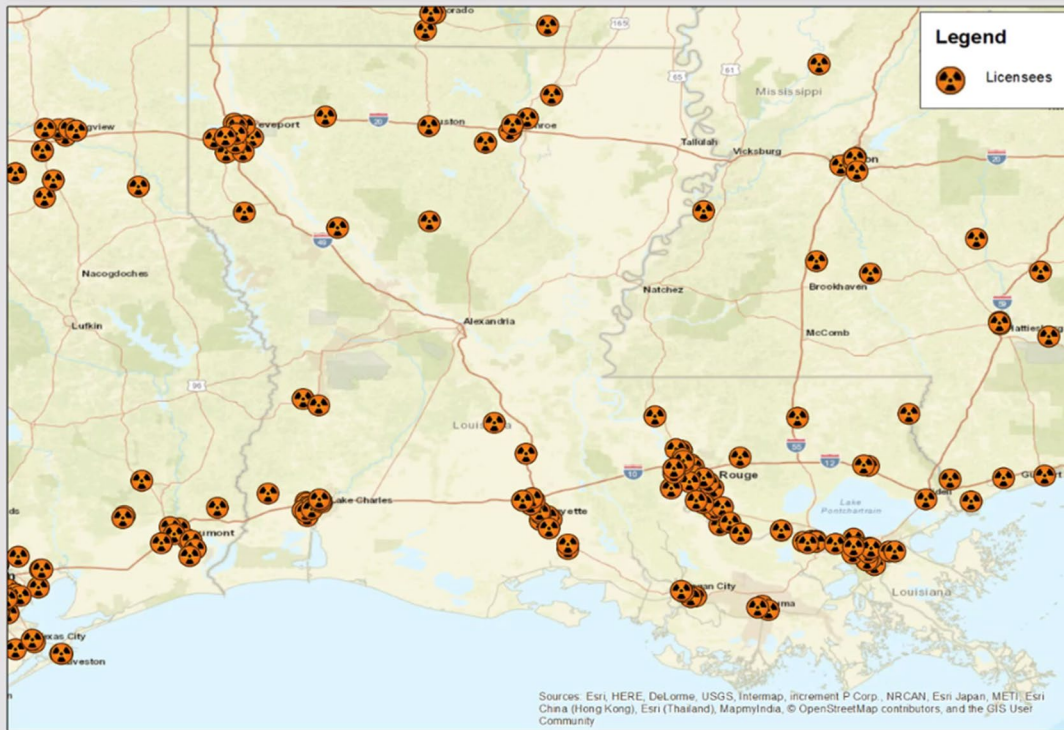
- **INTERNATIONAL ATOMIC ENERGY AGENCY - IDENTIFICATION OF RADIOACTIVE SOURCES AND DEVICES (SEPTEMBER 2007):** <https://www.iaea.org/publications/7567/identification-of-radioactive-sources-and-devices>
- **SANDIA NATIONAL LABORATORIES - DIRTY BOMB RISK AND IMPACT:** https://prod.sandia.gov/sand_doc/2017/179121r.pdf
- **ARGONNE NATIONAL LABORATORY HUMAN HEALTH FACT SHEET - RADIOLOGICAL DISPERSAL DEVICE:** http://www2.ergweb.com/bdrtool/rnls/anal_hhfs_rdd.pdf
- **US DEPARTMENT OF HEALTH AND HUMAN SERVICES - FIELD GUIDE FOR HEALTH AND SAFETY OFFICERS: RADIOLOGICAL INCIDENTS:** <https://www.remm.nlm.gov/fieldguide.htm>
- **FBI eGUARDIAN:** <https://www.fbi.gov/resources/law-enforcement/eguardian>



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Licensee Facilities



Source: NRC RAMQC Database
Flow Analysis by Oak Ridge National Laboratory 4/2021

0 30 60 120 Miles

Official Use Only

Cs-137 Average Shipments and Flows 2018-2020



Source: NRC RAMQC Database
Flow Analysis by Oak Ridge National Laboratory 4/2021

0 160 320 640 Miles

Official Use Only

Appendix D

The Hospital Preparedness Program (HPP) in conjunction with the hospital DRC network conducted a *Hospital Radiologic Readiness Survey* in March of 2023. With a 73% response rate of Tier 1 hospitals (80/109), this survey validated that just under 90% of respondents have RSOs within their facilities. Only 41% of hospitals reported having a health/radiation physicists at the hospital, however some hospitals do maintain access to these experts through contracts or an on-call schedule. Over half of the respondents (53/80) report they have hand-held detection devices readily available.

Hospitals with Radiation/Health Physicists	Hospital Decontamination teams trained on radiation
<p>Region 1 (2) East Jefferson General Hospital Touro</p> <p>Region 2 (4) BR General Our Lady of the Lake West Feliciana Parish Hospital Woman’s Hospital</p> <p>Region 3 (5) Assumption Community Hospital Franklin Foundation Hospital Ochsner St. Mary Hospital St. James Parish Hospital Thibodaux Regional Health System</p> <p>Region 4 (3) Mercy Regional Medical Center Ochsner St. Martin Ochsner University Hospital</p> <p>Region 5 (4) Lake Charles Memorial Health System Ochsner American Legion Hospital St. Patrick Hospital West Calcasieu Cameron Hospital</p> <p>Region 7 (8) Christus Highland Christus Bossier Ochsner LSU Shreveport Springhill Medical Center Willis-Knighton Bossier Willis-Knighton Health System Willis-Knighton Pierremont Willis-Knighton South</p> <p>Region 9 (8) Hood Memorial Lakeview Regional Medical Center Mandeville ED – St. Tammany Health Our Lady of the Angels OLOL Livingston Riverside Medical Center Slidell Memorial St. Tammany Health System</p>	<p>Region 1 (5) Children’s Hospital East Jefferson General Hospital New Orleans East Ochsner Medical Center West Jefferson Medical Center</p> <p>Region 2 (5) BR General Ochsner Baton Rouge Our Lady of the Lake West Feliciana Parish Hospital Woman’s Hospital</p> <p>Region 3 (1) St. James Parish Hospital</p> <p>Region 4 (4) Acadian Medical Center* Mercy Regional Medical Center Ochsner Acadia General Ochsner St. Martin</p> <p>Region 5 (4) Lake Charles Memorial Ochsner American Legion St. Patrick Hospital* West Calcasieu Cameron Hospital</p> <p>Region 6 (5) Bayne-Jones Army Community Hospital* Byrd Regional Hospital LaSalle General Hospital Rapides Regional Medical Center Trinity Medical Center</p> <p>Region 7 (4) Willis-Knighton Bossier Willis-Knighton Health System Willis-Knighton Pierremont Willis-Knighton South</p> <p>Region 8 (2) Franklin Medical Center* Union General Hospital*</p> <p>Region 9 (4) Mandeville ED – St. Tammany North Oaks Medical Center OLOL – Livingston* St. Tammany Health System</p> <p>*Hospital reports not having detection equipment on hand</p>
<p>Key Findings & Planning Assumptions</p> <ul style="list-style-type: none"> Hospitals without Radiation Safety Officers who also do not have a Radiation/Health Physicist may reach out immediately for assistance, expertise and/or equipment. Hospitals with Radiation/Health physicists are medical technical specialists who may advise during response and assist with sourcing supplies and clinical guidance. Of the hospitals surveyed, Regions 6 and 8 lack hospitals with Decontamination teams who have Radiation training. *Few of the decontamination teams with radiation training lack detection equipment – however they may maintain plans to obtain. ESF-8 DRC Network may be used to source detection equipment, using the survey results. DRCs along with LERN and EMS partners may need to coordinate transferring patients from facilities with radiation decontamination capabilities but little/limited clinical expertise. 	

Radiation/Nuclear Crisis Communications for Healthcare Coalition Members

Facility Messaging Audiences

- Public Information for citizens of communities in/near impacted areas.
- Patient/Visitor information for those already in the facility, un-affected.
- Staff and employee communication of the incident.

Facility Messaging Platforms & Information Sources

- Website, social media, and other media releases – press conferences, statements for publication shared by press.
- Internal notification systems – email, text, in-person briefings
- Utilize credible information sources to help craft message, such as local officials, industry representatives, HICS medical technical specialists, other state response agencies identified as credible sources through ESF-8 network partners as members of the Joint Information Center (JIC) team.

Hospital Communication Plan Checklist

(Reference: HICS *Incident Planning Guide – Radiation Incident*)

- Identify how the facility receives timely and pertinent information from field command – specifically radiologic source information, decontamination provided, and any relevant recommendations for decontamination and worker safety measures needed.
- Designate hospital liaison for communicating status changes and facility resource needs.
- Procedures to provide pertinent incident information to the following areas of the response operations:
 - Decontamination team
 - All treatment areas
 - Security
 - Hospital Command Center
- Procedure to notify field command of hospital screening areas and decontamination location(s), including ingress and egress routes for both EMS and self-presenting public – “worried well”.
- Procedure to notify local parish emergency officials or Emergency Operations Centers (EOCs), ESF-8 Designated Regional Coordinators (DRCs), Louisiana Emergency response Network (LERN), and local EMS agencies of hospital’s emergency operational status.
 - ESF-8 DRC partners will assist with sharing operational statuses of other hospitals and healthcare facilities in the impacted area.
- Identification of media briefing area and notification of scheduled briefings.
 - Media briefings provided in conjunction with other local briefings occurring through coordination with the JIC and local EOC.
 - Internal briefings supplied to staff and in-house patients/visitors throughout the event.
- Procedures to track patients associated with the radiation incident.

Other useful Crisis Communications resources can be found linked in the table at the end of this document.

Resources & References

State/Regional

The following references are cited within the Annex and provide fundamental response guidance.

- Louisiana Emergency Operations Plan
- Louisiana ESF-8 Network Coalition Response Plan
- Louisiana Peacetime Radiologic Response Plan (LPRRP)
- Louisiana Department of Environmental Quality (LaDEQ) Radiation Regulations
- Louisiana Framework for Mitigating Crisis Environments: Crisis Standards of Care Guidance and Resources for Hospitals (CSOC)
- Louisiana ESF-8 Burn Surge Annex
- Louisiana ESF-8 Pediatric Surge Annex
- Louisiana ESF-8 Fatality Management Plan
- Louisiana ESF-8 sponsored Radiological and Chemical Response Lunch and Learn Webinar Series presentations – Fall 2022

National

The following resources were referenced in the development of this plan.

- Advanced HazMat Life Support (AHLS) Course materials - <https://www.ahls.org>
- American College of Radiology (ACR), [*Disaster Preparedness for Radiology Professionals: Response to Radiological Terrorism*](#) (Government Version 3.0, 2006)
 - Risk Assessment
- Center for Disease Control (CDC), *Radiation Response Briefing Manual: A Guide for Key Leaders and Public Health Decision Makers* (July 2020).
- International Atomic Energy Agency (IAEA), *Categorization of Radioactive Sources – Safety Guide* (No. RS-G-1.9, 2005)
 - Risk Assessment
- NCTC-DHS-FBI, *Radiologic Threat Awareness - First Responder Toolbox brochure*; September 2020
- National Nuclear Security Administration (NNSA) Webinar Series: Crisis Communication for Radiation Emergencies; offered February – March 2023.
- Oak Ridge Institute for Science and Education (ORISE), [*Medical Aspects of Radiation Incidents, 4th Edition*](#)
 - Radiation Emergency Assistance Center/Training Site - <https://orise.orau.gov/reacts/>
- Radiation Injury Treatment Network (RITN) - <https://ritn.net/>
- Radiation Emergency Medical Management (REMM)
 - *Personal PPE in Radiation Emergencies*
 - *Radiation Exposure + Contamination: Diagnose and Manage ARS – Algorithm* <https://remm.hhs.gov/exposurecontam.htm>
 - *Radiation Exposure: Diagnose and Manage ARS – Algorithm* <https://remm.hhs.gov/exposureonly.htm>
- World Health Organization (WHO), [*National Stockpiles for radiological and nuclear emergencies*](#) (Policy advice publication, January 2023)

Additional Hospital and Clinical Focused Resources

<p>Planning & Training Resources</p>	<p>Training/Hospital Planning/Clinical Guidance</p> <ul style="list-style-type: none"> • ACR – Disaster Preparedness for Radiology Professionals • ORISE – Radiation Emergency Resources <ul style="list-style-type: none"> ○ Checklists and fast fact sheets for hospitals, clinicians and EMS ○ Triage resources for clinicians ○ Ground and Air Med Transport or Contaminated Patient – VIDEO (8 mins) • ORAU/CDC – Internal Contamination Clinical Reference Mobile APP • REMM Algorithm: Evaluate for Radiation Contamination and/or Exposure https://remm.hhs.gov/newptinteract.htm • EMSA - HICS Incident Planning Guide (IPG): Radiation Incident - https://emsa.ca.gov/ • Radiation Injury Treatment Network (RITN) Web-based Training - https://ritn.net/training/web-based-training <p>Decontamination</p> <ul style="list-style-type: none"> • Dry Decontamination Techniques and Best Practices, Del Valle Institute Learning Center - Dry Decontamination Techniques and Best Practices (bphc.org) <p>Detection/First Responder/Response Guidance</p> <ul style="list-style-type: none"> • DHS PRND – Aid book describes procedures for the use of the first responder PRND equipment • A Decision Makers Guide: Medical Planning and Response for a Nuclear Detonation https://remm.hhs.gov/decisionmakersguide.htm • Radiological Terrorism: Emergency Management Pocket Guide for Clinicians
<p>Communication Resources</p>	<p>Public Monitoring and Messaging</p> <ul style="list-style-type: none"> • CDC’s Population Monitoring in Radiation Emergencies: A Guide for State and Local Health Planners, April 2014 https://emergency.cdc.gov/radiation/pdf/population-monitoring-guide.pdf • FEMA’s Improvised Nuclear Device Response and Recovery: Communicating in the Immediate Aftermath, June 2013 (pre-scripted templates; questions to plan for) https://www.fema.gov/sites/default/files/documents/fema_improvised-nuclear-device_communicating-aftermath_june-2013.pdf • RITN: Radiation Safety Communication. Web-based training - https://ritn.net/training/web-based-training