Radiological Dispersal Device Playbook

Source: http://www.phe.gov/Preparedness/planning/playbooks/rdd/Pages/default.aspx

Introduction

The purpose of this playbook is to provide guidance for executive decision makers within the Department of Health and Human Services (HHS) in the event of an actual radiological terrorist attack in a U.S. city. Specifically, it outlines key measures and options to aid the Secretary in making essential decisions and directing the HHS response to a radiological attack.

The playbook functions as a resource document to the Assistant Secretary for Preparedness and Response (ASPR) to assist in coordinating the Department's Emergency Support Function (ESF #8) with other Federal and local emergency support agencies. It is not intended to serve as an instruction manual for implementing the ESF #8 missions at the operational or tactical level; rather, it illustrates the capabilities required to meet probable mission requirements.

This playbook is a living document that must be updated periodically to reflect evolving processes and policy decisions including changes resulting from interagency plans or policies. ASPR is responsible for managing this process of bringing the playbooks up to date.

Radiological Dispersal Device Playbook Overview

The playbook is based on the chronology of events outlined in the Radiological Attack scenario of the National Planning Scenarios (Scenario #11). The following phases drive the actions outlined in this playbook:

- **Phase 0: – Pre-Incident** (Situational Awareness, Credible Intelligence). Steady state operations and advance preparations are initiated for a large-scale response to a radiological attack, based upon credible intelligence of a plan to detonate a Radiological Dispersal Device (RDD) or a Radiological Explosive Device (RED) in a U.S. City. The primary strategy is to closely monitor events and begin advance preparations for an effective and timely response.
- **Phase I: – Early Phase** (0 – 24 Hours Post Detonation). The primary U.S. strategy is to assess the events and deploy assets to maximize survivors, treat injured victims, and aggressively administer an effective post-exposure prophylaxis program
- **Phase II: – Intermediate Phase** (24 – 72 Hours Post Detonation). The strategy is to provide surge capacity and rapidly deploy ESF #8 assets to provide assistance to State, Territorial, Tribal, or local officials in saving lives, minimizing adverse health effects, stabilizing public health, medical and human services infrastructure.
- **Phase III: – Late Phase** (72 Hours – 2 Weeks Post Detonation). The goal of this phase is to effect a smooth and transparent transition to long-term recovery while continuing to provide technical expertise to regional, state and local authorities as they rebuild their public health and medical infrastructure.

This Radiological Attack Playbook is prepared in accordance with the National Response Framework (NRF) and associated Federal regulating documents. There are six major sections to this Playbook including (A) introduction, (B) scenario; (C) concept of operations (CONOPs); (D) actions/issues; (E) pre-scripted mission assignments, and (F) essential elements of information (EEIs). These sections are briefly discussed below. At the end of the playbook, a list of acronyms used and their definitions is provided

- Introduction: The introduction briefly addresses the purpose of the playbook and how it is structured. This section also provides an overview of radiological dispersal devices and radiological explosive devices providing relevant information for preparedness and response operations. In addition, it covers some technical discussions which may be of interest primarily to subject matter experts.

- Scenario: The Homeland Security Staff Council (HSC) (now National Security Staff-(NSS)) –in concert with the Department of Homeland Security (DHS) the federal interagency, and State and local homeland security agencies– has developed fifteen all-hazards planning scenarios for use in National. Federal, State and local homeland security preparedness activities. These scenarios are designed to be the foundational structure for the development of coordinated national preparedness standards from which homeland security capabilities can be measured or assessed, The Radiological Attack scenario is an account or synopsis of a projected event. This scenario is used in policy planning within the Department of Health and Human Services (HHS) in an effort to set the conditions for conventional thought on how the department would approach, plan for, and possibly test strategies against uncertain future developments. The radiological attack scenario alerts us to different ways that future events could unfold. This scenario should not be used to forecast future events, but rather, it offers a plausible story line to account for possible future events leading toward a radiological attack as depicted in National Planning Scenario #11. The decision to use the HSC scenarios in the development of the playbooks provides a common set of conditions that provide interoperability with Federal, State and local emergency responders. It also allows HHS to work closely with our interagency partners through the National Response Framework (NRF) and the National Incident Management System (NIMS) to ensure efficiency and interoperability in responding to radiological incidents.
- Concept of Operations (CONOPs): This CONOPs evolves from a vision of actions and events and is a description of how a set of capabilities may be employed to achieve desired objectives or a particular end state for the radiological attack scenario. CONOPs take into account the steps and procedures that may be found in State, local, and Federal response plans to a radiological attack. The approaches incorporate the synchronized activities and capabilities under consideration and add the resource management details of whom, and where resources may be applied to achieve desired mitigating outcomes. The CONOPs do not describe how to conduct preparedness activities but merely serve as a discussion point for Federal, State, local, tribal, regional and territorial, planners to use as a baseline for a coordinated preparedness effort.
- Actions/Issues: This section refers to the steps associated with each phase of the event, further segmented by functional activity, including:
    - Planning and Coordination
    - Healthcare, Emergency Response and Human Services
    - Surveillance, Investigation, and Protective Health Measures
    - Pharmaceuticals, Medical Supplies and Equipment
    - Patient Evacuations, and
    - Communications and Outreach

- The actions/issues are the heart of this document and outline the steps necessary to achieve interagency coordination effects for the Radiological Dispersal Device Playbook. They also assign lead and supporting government agency responsibilities.
- Pre-Scripted Mission Assignments (PSMA) for ESF #8: PSMAs are defined as coordinated critical tasks that must be performed with or by other departments and/or agencies in the federal government. Representative departments and agencies are supporting entities within ESF #8. Federal supporting agencies include: the Departments of Agriculture, Energy, Homeland Security, Interior, Justice, Labor, State, Transportation, Veterans Affairs, and other agencies including Environmental Protection Agency, General Services Administration, and U.S. Agency for International Development, U.S. Postal Service, and the American Red Cross.
- Essential Elements of Information (EEIs): EEIs are those critical items of information needed to respond appropriately to circumstances surrounding the event. EEIs provide decision makers at all levels insight into how and where resources should be applied to achieve maximum benefit for the general population in easing suffering or protecting infrastructure. In this playbook, information requirements are derived as they relate to the preparedness and response activities for a radiological dispersal device attack.

Overview of Radiological Attack Devices

This playbook is based on the chronology of events in the National Planning Scenarios (Scenario #11) Radiological Attack - Radiological Dispersal Device. Since the emergency response has generic (triage, beds, medicines, transportation) and specific components (radionuclide specific response) some of the supporting details are useful but not essential for general operations personnel. They are more practical for Subject Matter Experts and other educational purposes.

Information in a **gray box** contains **non-essential** supporting information and **may be bypassed** when using the playbook.

Essential Facts

The widespread availability of radioactive material for industrial and medical use provides a broad range of scenarios for the abuse and subsequent exposure of civilian populations to radioactive material in potential terrorist events. The types of event can be:

- **RDD- Radiological Dispersal Device** can be of two general types. In both, radioactive material is dispersed into the environment.
    - **Dispersal of radioactive material via explosive detonation,** i.e., a combination of an Improvised Explosive Device (IED) and radioactive material
    - **Dispersal of radioactive material via non-explosive means**, e.g., in food, water, soil, or air, etc.
- **RED- Radiological Exposure Device** refers to a sealed radioactive source that is placed in a public place and causes exposure but not contamination to those in proximity. (Note: if an RED were to break open, it would then be similar to an RDD)

Exposure versus Contamination:

Matter that contains radiation-emitting atoms is radioactive material. Radiation is the energy released from radioactive material. It is critical to understand the difference between (a) exposure to radiation and (b) contamination with radiation. The medical effects and countermeasures differ significantly.

- **Radiation exposure** (or irradiation) occurs when radiation penetrates tissue, for example, when a patient undergoes a diagnostic X-ray. A person can be irradiated without physically contacting radioactive material. Exposure results from radiation external to the victim, and the victim is NOT radioactive. This radiation can be in the air or on the ground (groundshine). Internalized radiation can cause exposure.
- **Radioactive contamination** is radioactive material located in unintended places. Note: An exposed person is not necessarily contaminated because exposure does not require contact with radioactive material. However, as long as a person remains contaminated they will continue to be exposed to the radiation being emitted by the radioactive material with which they are contaminated. Contamination can be external (outside of the body) or internal (inside of the body) or both.
    - External contamination is radioactive material on a person's clothes, hair, or skin.
    - Internal contamination is radioactive material that has entered the body by inhalation, ingestion, or absorption through the skin or wounds.

Decontamination

- **External decontamination:** This is often readily accomplished by removing the person's clothing and shoes and washing the skin and hair with soap and water.
- **Internal decontamination:** Normal body-cleansing mechanisms (e.g., digestion and excretion) can often partially remove internal contamination. When medically indicated, decorporation agents, such as laxatives or chelating compounds, are administered to speed up excretion of internal contamination. Similarly, blocking agents can be used to inhibit uptake of some radioactive materials. Knowledge of the chemical nature of the contaminant is essential in making initial treatment decisions.

Matter that contains radiation-emitting atoms is radioactive material. Radiation is the energy released from radioactive material.

Properties of the radiation

Two properties of atoms are considered when determining how radiation affects people:

- **Element itself** (e.g. Cobalt, Cesium, Iridium, Iodine, Strontium) determines the chemical properties and biological distribution in the body.
- **The isotope** of an element determines the amount and type of radiation emitted. (Radionuclide and radioisotope, used interchangeably and refer to an unstable form of an element that decays resulting in the emission of radiation).

The selection of a medical countermeasure (e.g. decorporation, blocking agent, diuresis) is based on the element and its properties (e.g., Iodine vs. Cesium), the type and amount of radiation exposure received by an individual (alpha, beta, gamma, neutron), and the specific isotope (e.g., Iodine-131 vs. Iodine-125) and how much was encountered.

Clinical presentation and injury:

- **Explosive RDD**. Depending of the size of the explosion, an RDD detonation could generate a modest number of patients with physical trauma, thermal burns, contamination, and (in rare cases) radiation injury. These combined injuries (radiation

injury plus trauma) range from mild to severe/fatal. In this instance, the incident will be detected by physical detection devices.

- **Non-explosive RDD**. A non-explosive RDD (e.g. contamination of food or water, aerial dispersal, dispersal in a ventilation system), can potentially expose a modest number of people to moderate doses of radiation and many people to low doses of radiation. The event may be obvious in real time or may be subtle becoming recognized over time. In this instance, the incident can be detected by physical detection devices or by an astute clinician who recognizes the syndromes related to radiation injury. For low exposure (less than ~100 centiGrays (cGy) whole body dose) particularly with protracted exposure, there may be few telltale symptoms to suggest radiation injury.
- **RED**. An RED incident may be realized by direct discovery of an RED or by clinical recognition of an incident due to a number of people presenting at an Emergency Department, (not discovering the device per se), developing symptoms, and signs of radiation injury. As long as the radiation source remains closed and sealed, there will NOT be any contamination.

Psychological consequences:

- For both a non-explosive RDD and an RED, many people may present for medical care out of fear of possible exposure, far greater than those actually affected. Both the psychological impact of these events and the economic factors related to a contaminated environment can be substantial and long lasting. Those who are neither exposed nor contaminated may require reassurance. Responders, too, can have profound psychological effects from participating in the response to an incident and will need assistance.

Radiation Event Medical Management (REMM):

- Radiation Event Medical Management (REMM) is a web portal developed to assist health care providers to respond to mass casualty radiation events. It is collaboration between HHS/ASPR and the National Library of Medicine and contains just-in-time response algorithms, detailed event management information, and large amounts of supporting information explaining radiation and response, training and planning issues. A zip file with almost all the REMM files can be downloaded to a PC or to a PDA. Users are encouraged to join the REMM ListServ to be notified when updates are released. It can be used either online of offline. A ZIP file with almost all the REMM files can be downloaded to a personal computer or to a PDA device. Users are encouraged to join the REMM ListServ to be notified when new versions of REMM are released

Table A1. Overview of Radiation Events		
RDD - Explosive IED, etc.	**RDD Non-Explosive: Air, Food, Water, Soil**	**RED - Exposure**
• Immediately recognizable as "an explosive event". • Radiation might not be detected immediately. • Health physicists must map radiation levels in contaminated area to assess safety and determine allowable response time in various zones due to radiation. • Casualties from explosion are immediate. • No immediate deaths expected from radiation, but victim decontamination is essential.	• Time for initial release may not be known. • Can produce mass casualties by inhalation of contamination in ventilation or ingestion of food/water or products from soil. • Radiation dose can cause death in some scenarios. • Health physics measurements are critical in environment and probably in people. • May require broad interdiction of food, water until details sorted out.	• Time of initial exposure may not be known. • There can be exposure but no contamination (unless the source is broken). • Risk of mass casualty low. • Likely only partial body dose, so radiation-related death would be low. • Maybe difficult or impossible to sort out who was exposed to low doses.
Long term monitoring maybe required for victims and responders		

Assessing an RDD Attack

As a weapon, an RDD or RED (AKA “Dirty Bomb”) is considered as follows:

- Not a nuclear weapon
- Not a weapon of mass destruction

- A weapon of mass disruption, economic weapon, psychological weapon
- Impact depends on type of explosive, amount and type of radioactive material, and weather conditions
  Source: The Armed Forces Radiobiology Research Institute

Initial Steps: Determining the Type of Incident

- **Is this a radiological event?** It takes health physicists (includes other radiation protection specialists) to detect radionuclide, interpret data from radiation monitors, determine exposure rate, initially and over time, and help manage safety issues of the response to the event on site.
- **Is there exposure?** Is there radioactive contamination? Is radioactive material free in the environment from the explosion or dispersal?
  - If there is environmental contamination, highly contaminated areas will have to be cordoned. If there has been population contamination, decontamination of victims will be required for their safety and to prevent contamination of transportation, medical facilities, individuals or the environment. Life-threatening injury must be treated before decontamination. Removal of outer garments, showering and superficial decontamination removes about 90% of the external contamination.
- **Is there internal contamination?** If patients have ingested or inhaled radioactive material, or taken that material into their body through a wound or other means, they could be internally contaminated.
  - Special medications (e.g. decorporation and blocking agents) may be needed for those who have internalized radionuclide in sufficient quantity.
  - Subject matter experts will provide recommendations for which medications will be needed based on the identified radionuclides. Some of these medications are available in the Strategic National Stockpile, some are in state/local stockpiles, and others would need to be obtained through commercial sources.
  - Both exposure and contamination will likely happen to those very near the center of an explosive RDD. Further away, victims will likely have less intense contamination and consequently a lower exposure rate.

What Is The Size Of The Event?

- **Number of Casualties**. The number of casualties is very scenario dependent (nature of explosive, amount and type of radioactive material dispersed, location of the event, number of individuals affected, weather, etc.).
    - Serious injuries are likely to be in the hundreds; victims requiring decontamination and medical care may be in the thousands.
    - Victims requiring treatment for acute radiation syndrome (ARS) are likely in the hundreds at most. Most RDD events will have few severe ARS victims.
    - Individuals in need of counseling or consultation may be in tens of thousands, including responders.

Radiation doses

Unlike an IND event, an explosive RDD event produces no nuclear explosion or huge burst of radiation.

- **Radiation dose is cumulative**. The radiation dose from an explosive RDD can accumulate over time and the radiation injury depends on the duration and amount of exposure or contamination. The dose from an RED depends on the radionuclide used and how long any individual was near the radionuclide. “Committed dose” (term used to evaluate effects of the radiation) is a calculation of the dose an individual will receive over their lifetime from internal contamination. It is calculated from the knowledge of the radionuclide and from the amount a person has within them.
- **Acute Radiation Syndrome** (ARS) with nausea and vomiting can occur with doses above 0.75 Gray (Gy). However, clinically significant ARS requiring medical countermeasures for the hematological syndrome is unlikely unless victims absorb a cumulative whole body dose above 2 or 3 Gy (200 – 300 rem or higher). (rem is a radiation unit of measure and stands for "Roentgen Equivalent Man". While not precise, Roengten/hr and rem/hr are often used interchangeably.)
    - Permitted dose for responders is determined by the lifetime potential risk of radiation-induced cancer. Doses above 5 rem (5,000 mrem), but especially above 25 rem (25,000 mrem) would be of concern. At a dose rate of 1,000 mrem/hr, it would take a responder 5 hours to reach 5,000 mrem (or 5 rem).
- **Concentric radiation** “response zones”: will be created at the scene based on the dose rates measured at the scene. The dose rates measured will define the time people can spend in a particular location. Over time the dose rates will diminish and the perimeters of the zones will change. Weather conditions and ground topography also affect the shape and location of the zones.

Radiation Response Zones

Radiation “response zones” Determination

- Radiation “response zones” will be determined based on both data modeling and measured data by health physicists or other radiation protection experts (Military/Civil Support Teams, Interagency Advisory Team for Environment, Food and Health (A-Team) and possibly Radiation Emergency Assistance Center & Training Site (REAC/TS, in Oak Ridge, TN), and the Armed Forces Radiobiology Research Institute (AFRRI, at USUHS in Bethesda, MD)
- The "HOT" zone: perimeter at 5 rem or greater per 5 hrs (or 25 rem cumulative)
- The boundary line for the “no entry zone” will likely be about 100 meters for a small to intermediate sized device and up to 600 meters for a very large device (Harper 2007). Evacuation is recommended around 150 m and 1-15 km from the epicenter of detonation for these devices respectively.
- In the absence of real time measured radiation data, a zone of approximately 500 meters is a reasonable first estimate but this will be rapidly refined as measurements are obtained.
- Zone perimeters will change over time as the plume and footprint evolve. For most RDDs, the plume passage will last 20-30 minutes. Continuing on-scene measurements will be essential.
- The National Council on Radiation Protection (NCRP, Commentary 19) has made recommendations similar to those in Figure A1:
- The Inner Perimeter is 10 R/hr (similar to 10 rem/hr or 10,000 mrem/hr). (Note: “R/hr” means Roetgens/hour.)
- The Outer Perimeter is 10 mR/hr (similar to 10 mrem/hr)
- Boundaries of exclusion and short term activity are determined by local authorities, often with Federal advice. Boundaries will be refined as data are received and conditions evolve.
- Interagency Modeling and Atmospheric Assessment Center (IMAAC) models which account for event type and wind and weather data will be useful in creating response zones, but dose rate cannot be fully predicted because wind current and patterns are very complex, especially with the urban canyon effects. On ground measurements will be more accurate than modeling data.
- Illustration of prototypical “response zones” are in Figure A1 and described in Table A2 below.

Figure A1. Example of “boundary zones"
(Conference of Radiation Control Program Directors)

Figure A1 shows typical radiation zones (outlined in Table A2) and illustrates how boundaries could be established and how the allowed “work time in a zone” can be estimated. Concentric radiation “response zones” will be based on the dose rates measured at the scene. (The shape and location of the zones is a result of weather conditions and ground topography). The dose rates measured will define the time people can spend in a particular location. Permitted dose for responders is 5 rem. Doses above 5 rem (especially above 25 rem) are cause for concern. The Extreme Caution Boundary is the innermost perimeter which measures 10 rem/hr; the 5 rem limit is reached after 0.5 hours (and 25 rems within 2.5 hours) It is considered a “no entry zone”, restricted to very short-term life saving activities only. The figure shows the successive radiation zoning from High Radiation Boundary (the “Inner Zone” at 1 rem to Medium Radiation Boundary (the “Buffer Zone”) measuring 0.1 rem to Low Radiation Boundary (the “Outer Zone”) at 0.01 rem where initial decontamination may take place. The Incident Command Center (marked ê) is located outside the radiation zone. .Note that over time the dose rates measured will diminish and the perimeters will change.

Figure A1. Example of "boundary zones"
(Conference of Radiation Control Program Directors)

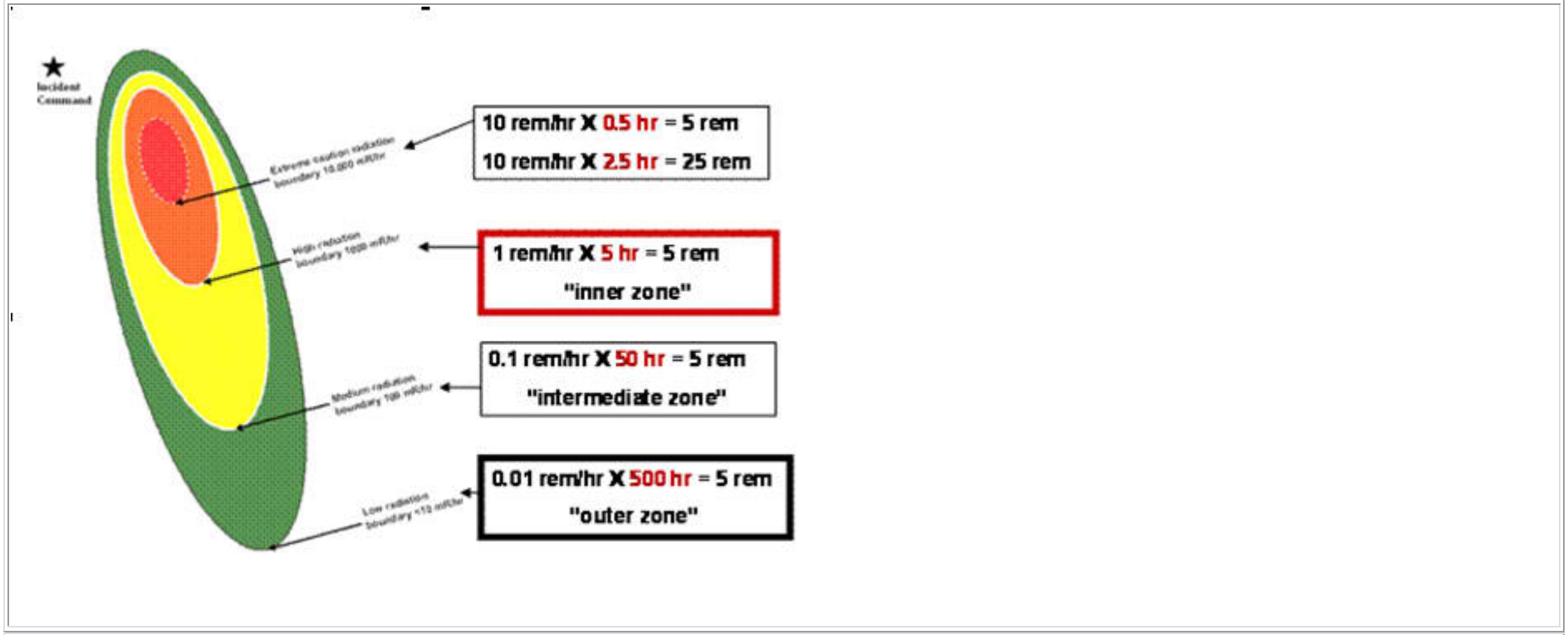

Table A2 How Radiation Zones could be determined - One Example
(Conference of Radiation Control Program Directors)

Extreme Caution Radiation Zone	Extreme Caution Radiation Boundary	≥10,000 mR/hr (10 R/hr)	• Activities restricted to saving lives • Total accumulated stay time for first 12 hours: minutes to hours.

Table A2 How Radiation Zones could be determined - One Example (Conference of Radiation Control Program Directors)			
High Radiation Zone	High Radiation Boundary	1000 mR/hr	Access restricted to authorized personnel performing critical tasks: • Firefighting • Medical Assistance • Rescue • Extrication • Other time-sensitive activities
Medium Radiation Zone	Medium Radiation Boundary	100 mR/hr	Access restricted to authorized personnel entering the "High Radiation Zone" to perform critical tasks such as saving of lives and property. • Serves as a buffer zone/transition area.
Low Radiation Zone	Low Radiation Boundary	≤10 mR/hr	Access restricted to essential individuals. • Initial decontamination of first responders should occur near the "outer boundary" (i.e., "Low Radiation Boundary") of this area. • Victims with only lower body contamination have a low likelihood of prior radionuclide inhalation and internal contamination, since they were probably exposed walking across the zone and not from the plume.

Shelter-in-Place

- Sheltering during the short-lived plume (about 20-30 min) may be beneficial, but evaluation of the incident and public messaging may not occur in time for this to be effective.
- Protection from radiation is also afforded by the building itself, but this is variable.
- Since air handling in some buildings may concentrate radiation, it is not easy to have simple guidelines for shelter-in-place recommendations during and after the plume passes by. Given the short-lived duration of most airborne radionuclides (about 20-30 min), it is not likely that shutting down a building ventilation system will be effective. After the plume has passed, the inside of some buildings may have higher air concentrations than outside, depending on the air system, filtration, etc.
- Evacuation routes from the affected zones need to be planned, with radiological monitoring of victims at exits to see which victims need decontamination and possible treatment.

Decontamination

- For uninjured people, ambulatory decontamination is primarily removal of outer garments and showering. The size of the event will help determine whether ambulatory decontamination will be done primarily in formal decontamination sites or at home. Contaminated garments and personal property require proper disposal for potential forensic evaluation and safety. Removed personal effects and clothes should be bagged, labeled, and kept away from people and animals.
- Injured victims also need decontamination. Some may be transported through decontamination tents on a litter. Decontamination for others will be improvised, understanding that life-saving measures always take precedence over decontamination.
- Victims with only lower body contamination have a low likelihood of prior radionuclide inhalation and internal contamination, since they were probably exposed walking across the zone and not from the plume.

Determining the Radionuclide

Identification of the radionuclide is essential. This information will help determine the possible physical damage from the event, as isotopes can only be “weaponized” in certain ways, based on their physical properties (Harper 2007). In addition, the appropriate medical countermeasure for those who need treatment is generally radionuclide-specific.

- Health physicists/safety officers will determine the radionuclide(s).
- Multiple radionuclides may be used in one event.
- Sampling of the environment using specialized radiation detectors will ordinarily detect the radionuclide(s) involved. Various governmental agencies will do that.
- Laboratory analysis of human samples (nasal swabs, feces, urine), may be necessary to evaluate which victims need treatment and evaluate the efficacy of that treatment. State labs may be used as well as those from CDC and other resources.
- Most likely radionuclides for an RDD or RED event include Cesium chloride, Cobalt, Americium, Iridium, although others may also be used. Multiple agents may be used in a single event (Harper 2007).

Table A3- Examples of radioactive material that might be used for RDD
(Armed Forces Radiobiology Research Institute)

Radionuclide	**Half-Life**	**Typical Activity**	**Use**
Cobalt-60	5 years	15,000Ci	Cancer Therapy
Cesium-637	30 years	$1.5x10^{6}$Ci 10mCi	Food Irradiation Medical Source
Iridium-192	74 days	150Ci 1mCi	Industrial Radiograph Medical Source
Plutonium-238	80 years	varies	Satellite Power Source
Strontium-90	29 years	40,000Ci	Radio-Thermal Generator (RTG)
Iodine-131	8 days	0.015Ci	Cancer Therapy
Americium-241	432 years	$1.5x10^{-6}$Ci	Smoke Detector

- Amount of radionuclide is determined by disintegrations per second (Curies, Ci)
- 1 Ci (Curie) = 3.7×10^{10} disintegrations per second (dps)
- 1 Ci = 3.7×10^{10} Bq
- 1 Bq (Becquerel)= 2.7×10^{-11} Ci

Table A3- Examples of radioactive material that might be used for RDD
(Armed Forces Radiobiology Research Institute)

- Physical half life describes the length of time it takes for a radioactive substance to lose one-half of its radioactivity.
- Biologic half life describes time required for the radioactivity of material taken in by a living organism to be reduced to half its initial value by a combination of biological elimination processes and radioactive decay.

Table A4: Analysis of likely RDD materials (Harper 2007)
RDD Types and Effects (10kCi Devices)

Nuclide	Primary Radiation Type (Half Life)	Primary Form	Size of Source for calculation in GBq(Ci)	Application that forms the basis for size of source
^{90}Sr	Beta (28.6y)	Ceramic ($SrTiO_3$)	$1.11x10^7$ GBq (300,000 Ci)	Large radioisotopic thermal generator (RTG) (Russian IEhU-1)
^{137}Cs	Beta + Ba -137 m Gamma (30.17y)	Salt (CsCl)	$7.4x10^6$ GBq (200,000 Ci)	Irradiator
^{60}Co	Beta, gamma (5.27y)	Metal	$1.11x10^7$ GBq (300,000 Ci)	Irradiator
^{238}Pu	Alpha (87.75y)	Ceramic (PuO_2)	$4.92x10^6$ GBq (300,000 Ci)	RTG used for the Cassini Saturn space probe
^{241}Am	Alpha (432.2y)	Pressed ceramic powder (AmO^2)	$7.4x10^2$ GBq (20 Ci)	Single well logging source
^{252}Cf	Alpha (2.64y)	Ceramic (Cf_2O_4)	$7.4x10^2$ GBq (20 Ci)	Several neutron radiography or well-logging sources
^{192}Ir	Beta, gamma (74.02d)	Metal	$3.7x10^4$ GBq (1,000 Ci)	Multiple industrial radiography units
^{226}Ra	Alpha (1600y)	Salt ($RaSO_4$)	$3.7x10^3$ GBq (100 Ci)	Old medical therapy sources

Table A5: Types of RDD's and their general impact
(Armed Forces Radiobiology Research Institute)

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(Armed Forces Radiobiology Research Institute)

Type	Isotope	Physical Form	Dispersal Method	Construct Difficulty	Early Deaths	Psychological Effect	Economic Effect
Radiological Exposure Device	Co-60 Cs-137	Metal, Salt	None	L	Maybe	M	L
Food or Water	Cs-137 Pu-238 Sr-90	Salt Solution	Dissolve	L	Food-Yes Water - No	H	M
Fragment RDD	Co-60 Sr-90 Pu-238	Metal Ceramic	HE	M	No	M/H	M
Non-respirable Aerosol RDD	Cs-137 Co-60 Sr-90 Pu-238	Salt, Metal, Ceramic, Solution	HE Sprayer	M	No	H	H
Respirable Aerosol RDD	Sr-90 Cs-137 Co-60	Sat, Metal, Solution	HE Sprayer	M/H	Maybe	H	H

H,M,L- High, Medium, Low, not otherwise defined

Triage System-Organizing the Medical Response

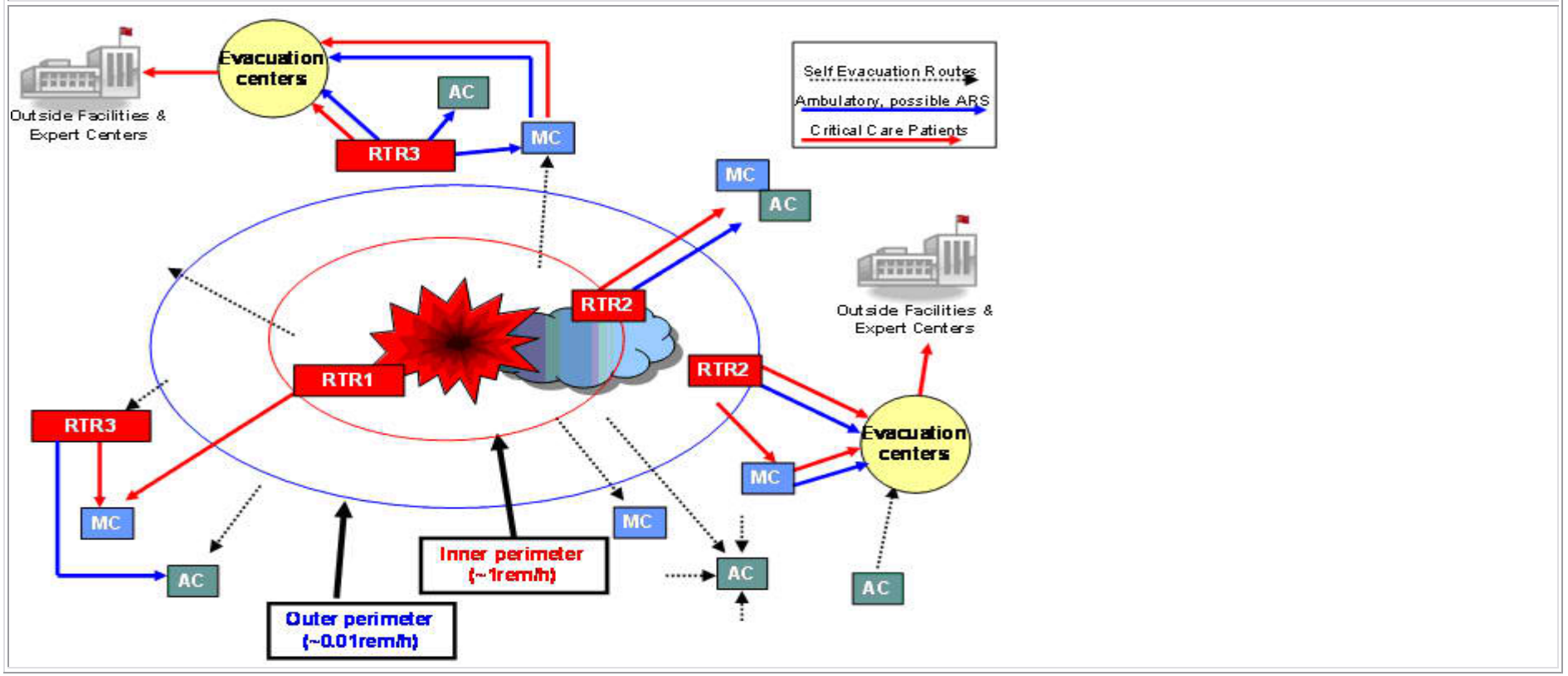
- Conceptual triage approach (see Figure A2-A3) is similar in concept to that of an IND in that the functions at the RTR, MC and AC sites are similar- described below) (Hrdina publication).

- The size of an RDD is such that it is likely the local/regional responders and medical facilities will be able to take care of the most if not all of the victims. However, large events may require substantial support from regional partners and possibly federal resources.
- Multiple simultaneous or closely spaced events may lead to a situation in which regional Emergency Medical Assistance Compacts (EMAC) may not be honored due to concern for additional events. This would accelerate the need for federal resources
- Nonetheless, whatever the size of a radiological event, a national response will likely be initiated immediately, with resources allocated as needed. (they can stand down if not needed)
- Assets of ESF#8 will be alerted and mobilized, including NDMS and other assets
- Radiation Injury Treatment Network (RITN) will be alerted
- HHS SOC will use GIS system (note: MEDMAP project) to identify medical facilities in the area and region

Figure A2 Conceptual Triage System - RTR Sites
(See Figure A3 for definitions)

Figure A2 is a diagram of a conceptual triage system near the affected area. Close to the blast site, around the perimeter of the High Radiation zone or “inner radiation boundary” RTR1 site(s) will be set up for victims from the immediate blast site with major contamination, injuries, and/or trauma. Responders may only dwell for a limited time. RTR2 site(s) will be set up near the “outer radiation zone” where responders’ time will still be carefully monitored. Most ambulatory victims will be assessed, and those with ARS (Acute Radiation Syndrome) may receive immediate care, and others will be directed as appropriate to Evacuation Centers and predetermined Medical care sites (MC) for treatment or Assembly Centers (AC) limited care and transport to nearby facilities and victim tracking. RTR3 sites will be set up outside the outer perimeter and act as collection sites for affected persons leaving the blast area; RTR3 sites will provide paramedic acute care, stabilize victims and direct them as appropriate to MCs, ACs, Evacuation Centers, or transport them to outside facilities.

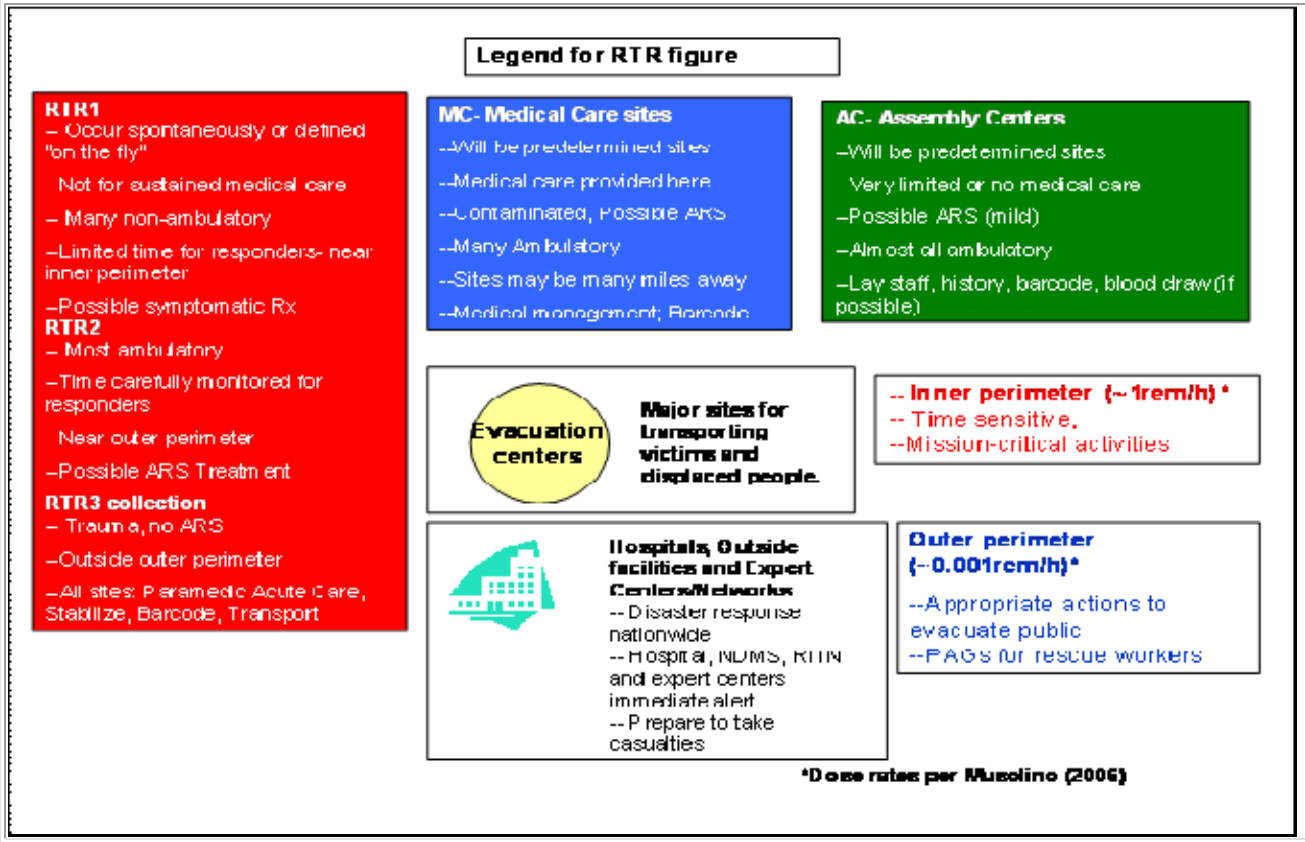
Figure A2 Conceptual Triage System - RTR Sites
(See Figure A3 for definitions)



- The zones will be determined by externally measured dose rates.
- In this Playbook, 1 rem/hour (1000 mrem/hr) is used as the “inner boundary” and 0.01 rem/hr (10 mrem/hr) as the “outer boundary”. This is for illustration purposes and is consistent with NCRP (Commentary 19) guidelines. There will likely be intermediate zones established so that time spent and dose received by responders will be limited.

- Relocation guidelines will also be established by local/regional/state/tribal authorities in consultation with federal experts.
- Due to wind currents and other factors, there may be irregular shaped zones and the zones will change over time.

Figure A3. Definitions of RTR zones



RTR sites are functional sites that define TRiage, TReatment, and TRansport functions. Time in zone may be limited by radiation.

Figure A3. Definitions of RTR zones

RTR sites form spontaneously: Victims immediately in the blast site may have injury from the blast, fairly heavy contamination from radiation or combined injury (physical trauma and burn plus radiation). The radiation dose is likely to be limited as there is no detonation effect as with an IND but rather the radiation is being accumulated over time. RTR sites will be identified “on the fly” by responders and coordinated with the Emergency Operations Center (EOC). Health physicists and other radiation protection specialists will provide subject matter expertise to help interpret the readings obtained by emergency responders.

- **RTR1** will have limited time for emergency workers but the high dose zone will be small and most likely a few hundred meters in diameter.
- **RTR2 sites**. These will be near the plume/footprint zone, recognizing that the plume will be very short-lived. While there may be some re-suspension of radioactive material most of the residual radiation will be a footprint on the ground and not a plume.
- **RTR3 sites**. Collection points with radioactivity screening (using survey meters) to identify those victims requiring decontamination and/or medical management.

MC (Medical Care) sites will be the focus of medical management. It is likely that the local hospital network will have adequate resources although regional facilities may be needed. Some hospitals may be off line due to the location of the RDD and plume. Expert centers for trauma or burn care may be needed beyond the region. Acute Radiation syndrome may occur depending on the size of the device. Management and decorporation treatments will be managed locally or possibly through the National Disaster Medical System, the Radiation Injury Treatment Network and/or other expert centers.

- **AC** (Assembly Centers) will be used for displaced persons and for those with minor injury. This will be coordinate with ESF #6.
- **Population monitoring** (Plans for this are in progress- see Briefing Paper #16)
- **Victim tracking** is important. There are various systems in place with work ongoing to establish national standards or at least to try to establish compatibility among systems. The CDC will be called on for this.

Decontamination

Decontamination is a local responsibility.

ESF#8 will assist local authorities with coordination of decontamination of victims, responders, and persons exposed to contamination by an RDD.

Procedures used for decontamination are incident specific and may vary considerably. These procedures will be influenced by various factors including the following:

- Size and type of event
- Location of the event
- Weather conditions
- Availability of local decontamination resources and personnel to carry it out
- Whether or not “time zero” is known (as with a non-explosive RDD)
- Extent of civilian chaos
- Numbers of people self-evacuating before safe zones and decontamination areas can be established
- Concerns of the many people who may be far from the blast but who later worry about having been contaminated and who need reassurance
- Special concerns need to be paid to the following groups and issues:
    - Victims injured on the scene potentially requiring life-saving medical intervention prior to decontamination.
    - At-risk individuals.
    - The need to avoid contaminating transportation vehicles of any kind.
    - The need to avoid contaminating Emergency Departments and other receiving areas including Red Cross shelters.
    - Concerned citizens who are not exposed or contaminated but who need assurance.
- Personal external decontamination could take place in a number of places:
    - At entry points to medical facilities, to avoid contaminating the facility. Those needing life-saving care will require careful handling to minimize impact on care-givers and on the facility.
    - At exit points from control zones, for those who are ambulatory.
    - At entry points to collection sites

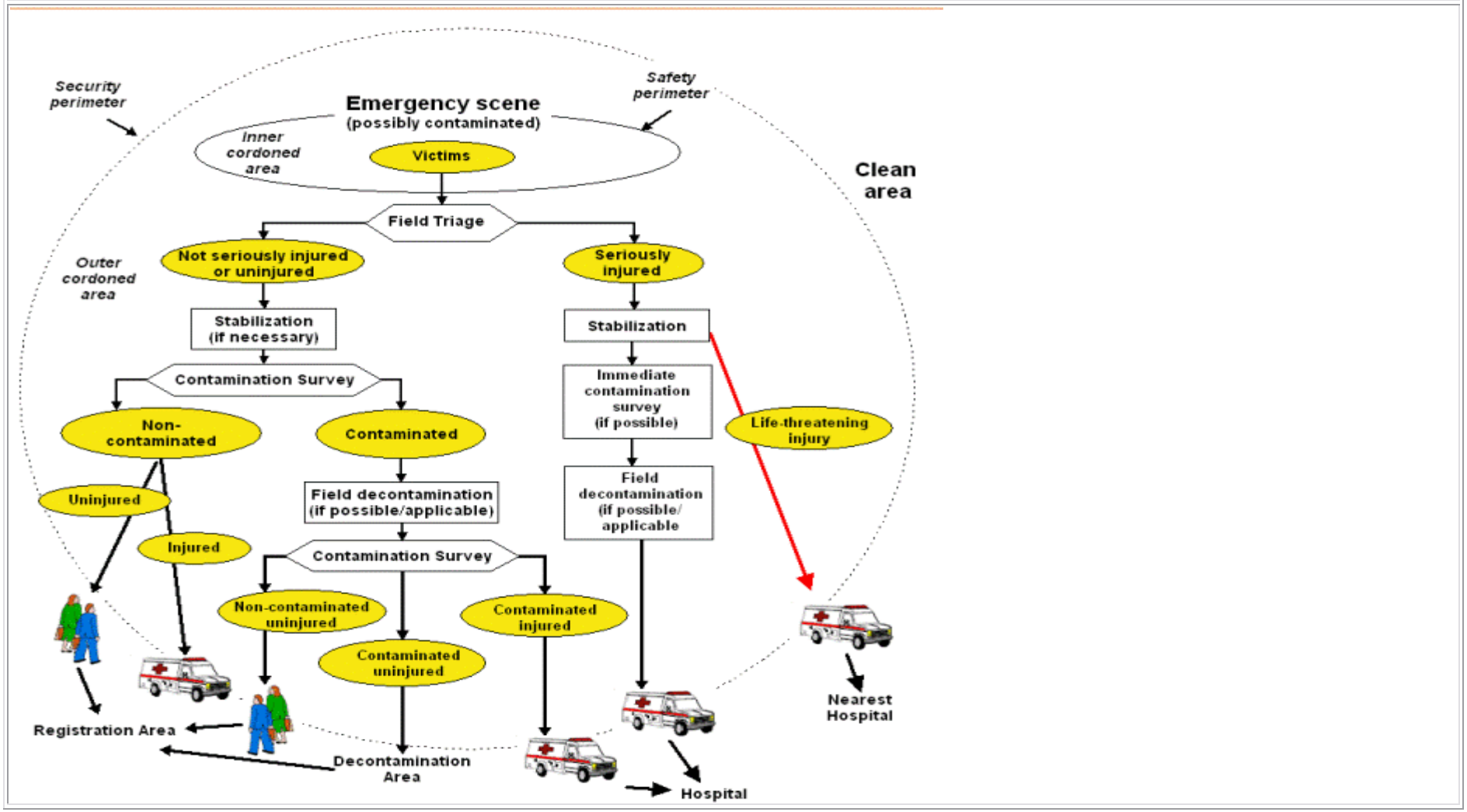
  - At home or remote sites for self-decontamination of those who leave the scene before decontamination sites are established or who flee the scene.
- Monitoring/assessment for victim contamination will occur at:
  - Medical facility entry point.
  - Exit points from control zones, as needed.
  - Entry points to shelters such as American Red Cross and other AC collection sites. This is required for ESF #6 care.
  - Various remote sites for concerned citizens (so-called “worried well”).
  - Transportations sites for DOD transportation (no contamination is allowable) or other transportation hubs.
- Referral for surgical or medical internal decontamination may be needed for any victim with the following conditions:
  - Adequate external decontamination does not result in removal of radiation levels to below about 2 times background, thus indicating possible significant internal contamination.
  - Obvious shrapnel wounds containing radioactive materials. Surgical debridement with radiation precautions will be required.
- By history/location during an event, a victim may be at risk for having inhalation or ingestion. In lieu of a complex flow diagram illustrating these many possibilities, Figure A4 is a schematic as to how victim flow may occur at an RDD event, particularly one in which the event is obvious.

Figure A4 Victim Handling Flow at Emergency Scene

Figure A4 illustrates the victim handling flow at the emergency scene. Life-Field triage will separate out the seriously injured, ensuring that life-threatening injuries are treated first and such patients are transported to the hospital immediately, even if contamination survey has not been done. Other seriously injured victims are also stabilized first before addressing contamination.

While still within the “outer cordoned area” (or “Outer Zone”) contaminated patients are isolated among the non-critically injured victims. Decontamination protocols are administered before treating for minor injuries and before entering the “clean area” to transport them to other facilities. This will reduce the possibility of spreading contamination beyond the initial perimeter of potential contamination.

Figure A4 Victim Handling Flow at Emergency Scene



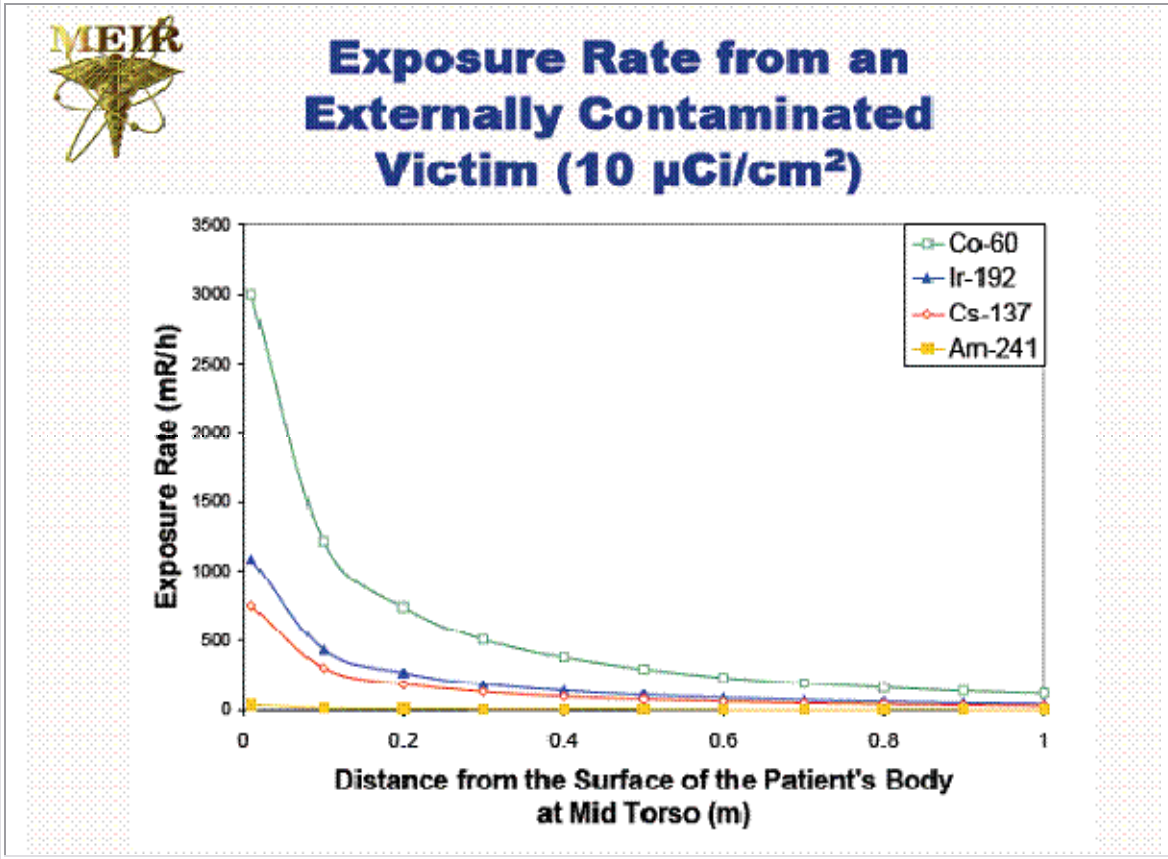
Evacuation / Transportation

- Transportation out of the event and transportation towards the event will be needed.
- Medical resources may need to be imported. While this is event dependent, major medical packs from the SNS will not likely be necessary for modest sized RDD events. However, resources and supplies may be needed to support local hospitals over time, possibly including FMS and decorporation agents.
- Emergency personnel: various HHS medical personnel and materiel assets will likely be deployed, at least on a stand-by basis.
- Evacuation may be needed for displaced persons based on the situation at the site. This could be from the explosive damage to infrastructure or to radiation contamination. In a large scale event, medical evacuation will be needed.
- Keeping transport vehicles free from internal contamination is a high priority so that they can remain “on line.” This may not be entirely possible when transporting the critically injured.
- DOD and ESF #1 assets will not transport contaminated individuals. There are no exceptions to this for the DOD. Local governments may operate in the same way.
- **Medical Responders May Be At Risk for Significant Dose**
    - Life-threatening injuries must be managed before dealing with decontamination (Smith, 2005). Nevertheless, there are settings in which medical personnel might be exposed to a relatively high dose of radiation, as with cobalt radioactive shrapnel embedded in a victim.
    - Removal of outer garments and washing of exposed skin and hair from the victims and showering will usually remove about 90% of the victims’ contamination,.
    - Health physicists/safety officers will provide guidance to medical and other responders. The use of personal dosimeters during work tours will be important. This is a local responsibility. HHS must not give reassurance until data have become available. Information recorded by the dosimeters must be carefully stored during and after the event.
    - First responders should use appropriate Personal Protective Equipment (PPE) to minimize contamination and have appropriate personal radiation dosimeters to guide the time they can be exposed to radiation.

Figure A5 Exposure Rate from an Externally Contaminated Victim
Figure A5 illustrates how medical personnel might be exposed to radiation from shrapnel embedded in a victim. The closer to the source (the victim’s body surface), the more likely doses resulting in ARS could be produced over an hour or so. Exposure rates

Figure A5 Exposure Rate from an Externally Contaminated Victim

depend on the radionuclides. For example, Cobalt produces more dose than Iridium, Cesium and Americium at close proximity: Working directly on the victim's body (i.e., at zero distance), the exposure rate for Cobalt-60 is 3,000 mR/hr, about 1,100 mR/hr for Iridium-192, 750mR/hr for Cesium-137, and under 50mR/hr for Americium. Beyond one meter distance, however, even for Cobalt-60, external contamination produces very little exposure to personnel.



- Exposure rate versus distance for various radionuclides considered likely for an RDD.
- Even for Cobalt-60, external contamination produces very little exposure beyond 1 meter.
- The closer to the source, the more likely doses resulting in ARS could be produced over an hour or so.
- Cobalt produces more dose than Iridium, Cesium and Americium.

Dose limits

- Draft Protective Action Guidelines to guide responses to radiological and nuclear events were published in the Federal Register, January 6, 2006 (Table A6)
- 5 rem total dose is the annual limit for occupational radiation workers doing their normal jobs. This is cumulative dose over time (up to a year). If actual dosimeters are not used, cumulative dose can be estimated based on physical measurements of dose rate by environmental survey meters.
- Higher dose limits are permissible for Emergency Response Workers in certain specific circumstances (Table A6) 25 rem is the guideline limit with only a few exceptions. Above that dose, informed consent is required.
- Local governmental entities and unions may have established different guidelines.
- Pregnant women must avoid exposure. Special counseling will be needed for pregnant victims including efforts to estimate their fetus' exposure.
- In general, the risk of a radiation-induced cancer is 8% for 100 rem (5 rem is less than 1% and 25 rem is about 2%). This is in addition to the background lifetime risk of 30-40%. Radiation-induced cancer has long latency (10-30+ years) so that younger people are at greater risk.

Table A6- Protective Action Guides (PAGs)
(Federal Register, January 2006)

Phase	Protective Action	Protective Action Guide	Reference
Early	Limit Emergency Worker Exposure. Sheltering of Public Evacuation of Public	5 rem (or under exceptional circumstances[1] 1 to 5 rems projected dose[2] to 5 rems projected dose[3] For potassium iodide, FDA Guidance dose values[4] [5]	EPA PAG Manual EPA PAG Manual

Table A6- Protective Action Guides (PAGs) (Federal Register, January 2006)			
	Administration of Prophylactic Drugs.		EPA PAG Manual FDA Guidance[6]
Intermediate	Limit Worker Exposure. Relocation of General Public	5 rem/yr 2rems, projected dose first year Subsequent years: 500 mrem/yr projected dose.	EPA PAG Manual
Late	Food Interdiction Drinking Water Interdiction Final Cleanup Actions	500 mrem/yr projected dose Late-phase PAG based on optimization.	EPA PAG Manual FDA Guidance[7]

[1] In cases when radiation control options are not available or, due to the magnitude of the incident, are not sufficient, doses above 5 rems may be unavoidable.
[2] Should normally begin at 1 rem; however, shelter may begin at lower level if advantageous.
[3] Should normally begin at 1 rem.
[4] Provides protection from radioactive iodine only.
[5] For other information on medical prophylactics and treatment please refer to http://www.fda.gov/Radiation-EmittingProducts/default.htm, http://www.bt.cdc.gov/radiation/ or http://www.orau.gov/reacts.
[6] Potassium Iodide As A Thyroid Blocking Agency in Radiation Emergencies, http://www.fda.gov/ForIndustry/FDAeSubmitter/ucm107871.htm, December 2001, Center for Drug Evaluation and Research, FDA, HHS.
[7] "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, "August 13, 1998, Office of Health and Industry Programs, Center For Devices and Radiological Health, FDA, HHS.

Table A7 - Protective Action Guides (PAGs) Response Worker Guidelines

Table A7 - Protective Action Guides (PAGs) Response Worker Guidelines		
Total Effective Date Equivalent (TEDE) guideline	**Activity**	**Condition**
5 rems	All occupational exposures	All reasonably achievable actions have been taken to minimize dose.
10 rems*	Protecting valuable property necessary for public welfare (e.g. a power plant)	Exceeding 5 rems unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose.
25 rems**	Lifesaving or protection of large populations....	Exceeding 5 rems unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose

Personal Protective Equipment

Avoiding inhalation of radionuclides is critical.

- Appropriate **Personal Protective Equipment**, including respiratory protection, is necessary for responders who may be exposed to any radionuclides. Improvisation may be necessary for people in the affected zones who do not have appropriate PPE. Even victims in the area should use improvised respiratory protection.

Fatality Management

Fatality management and management of radioactive remains will be coordinated through HHS using established guidelines (CDC).

Medical Countermeasures

- Detailed medical management guidelines are included on the web portal Radiation Event Medical Management
- Local responders should be encouraged to use REMM for medical guidelines.
- Diagnostic assessment of victims potentially exposed to and internally contaminated by radiation is essential. This includes but is not limited to:
    - History, physical examination, hematology (blood counts) and blood chemistry evaluation.
    - The CDC Laboratory Response Network may be needed to supplement local/state/regional/tribal resources.
    - Special analysis may be required (e.g. nasal swabs, skin or hair swabs urine or feces) to determine presence of radiation and possibly the identification of the specific radionuclide. Internal contamination requires accurate analysis and usually repeated sampling for appropriate clinical management. The size of the event and potential number of victims will be used to determine how to utilize the limited laboratory assay capabilities. For example, nasal swabs, skin or hair swabs might be done for a small-sized event, but not a large one.
    - These analyses will be coordinated through the Centers for Disease Control (CDC) Radio-bioassay laboratory.
    - Low levels of contamination will not need treatment. Therefore, bioassay (to measure the type of radionuclide) and dose calculation (with biodosimetry) are important in knowing which patients need therapy. If empirical treatment is started before measurements are available, as might be done with DTPA (plutonium, americium) or Prussian Blue (Cesium), the treatment course may be discontinued if unnecessary.
    - Currently, CDC has limited capacity to provide bioassay results. If the number of casualties is large, the laboratory capacity may be insufficient, and patients will be managed clinically.
    - Annual limit on intake (ALI) - is the derived limit for the amount of radioactive material taken into the body by inhalation or ingestion in a year. ALI is the value of intake of a given radionuclide in a year that would result in a committed effective dose equivalent of 5 rem (0.05 Sievert) or a committed dose equivalent of 50 rem (0.5 Sievert) to any individual organ or tissue (adapted from Nuclear Regulatory Commission). In general, treatment for internal contamination is given is 10 times the ALI is calculated.
    - Most authorities do not recommend treatment of internal contamination when the body burden is less than one annual limit of intake (ALI). Treatment is strongly recommended when the body burden exceeds 10 ALI. For internal contamination levels greater than 1 ALI and less than 10 ALI, clinical judgment dictates treatment of internal contamination.

- If there is concern about a possible diagnosis and need for treatment of Acute Radiation Syndrome, monitoring of blood counts and possibly special biodosimetry analysis (if available) may be needed.
- Specific treatments are available for particular radionuclides as listed below. The identification of the radionuclide is important so that unnecessary toxicity is avoided.

Table A8. Examples of radionuclides and medical countermeasures
(See REMM.nlm.gov for details, also in Briefing papers)

Radionuclide	Medical countermeasure	Procured through
Cesium	Prussian Blue	Local institutions and commercial vendors SNS
Plutonium, Americium	DTPA	Local institutions for Ca-DTPA and some Zn-DTPA SNS can provide Zn-DTPA and restocking
Strontium	Calcium, ammonium chloride, other	Commercial vendors
Iodine	Potassium iodide	Commercial vendors

- **Not all victims with internal contamination require treatment.** Many countermeasures have an unfavorable risk-to-benefit ratio when used to treat persons having low levels of internal contamination.
- An event with radioactive iodine would require appropriate identification (by determination through, survey or interview of likely proximity or ingestion or inhalation) of exposed children and young adults so KI could be provided to prevent later development of thyroid cancer. Administration must be started promptly, ideally by 4-5 hours. Most of the efficacy is lost if more than 12 hours have transpired. KI is not indicated for other radionuclides.
- The development of Acute Radiation Syndrome severe enough to require countermeasures for treatment is unlikely for those receiving whole body doses below 2 Gy. Individuals who receive a cumulative whole body dose of >2 Gy and < 3Gy need to be monitored very closely, as they may need treatment for ARS. Those suspected of having received a dose above 3 Gy probably need prompt medical intervention with “mitigating agents” such as hematological growth factors for granulocytes. Other ARS agents are in development. Management details are in REMM.

Managing Potential Long-Term Medical Consequences: Fear of Cancer

- The disruptive aspect of an RDD will quickly become the major aspect of this event including health fears, economic loss, and infrastructure disruption. The major health fear is likely to be the "perceived risk" of the inevitability of developing a radiation-induced cancer.
- Fear of damage to fetuses and concerns about genetic mutations that could be passed along to future generations will likely arise as well. These fears are best addressed by education including public media presentations and also by regional face-to-face meetings with medical and epidemiological experts.
- It is possible that there will be suspicion of any comments from government officials who are not medical experts, so HHS will try to use academic and medical radiation experts. These include staff from the National Cancer Institute, CDC, NIH, epidemiologists involved in the Japanese atomic bomb studies including the Japanese Radiation Effects Research Foundation (REFR) and from the Chernobyl studies. Other international experts may be called upon.
- For those victims who had potential for low dose exposure, cytogenetic biodosimetry studies may be conducted. Radiation produces characteristic chromosome changes in white blood cells (called dicentrics) that are stable for many years so that the Radiation Laboratory Response Network (Rad-LRN which is still being established) could study potential victims and correlate the number of dicentrics with estimated dose (see REMM).
- Given the time and expense of these tests, only those who were clearly within a zone in which exposure may have been relatively high and those who had suspected contamination determined by a health physicist will be subject to study. While the exact cut-off would be determined at the time of the event, a suspected dose of less than 50 - 75 cGy (rem) would not require study as this would raise the lifetime risk by about 4% at most. Age would also be a factor in deciding whom to study. Emphasis on studying young people is important because the latency for radiation-induced cancer is usually at least one decade, often 3 or more. Other medical factors would be considered regarding biodosimetry study and the need and type of long-term screening.
- As has been learned with genetic testing for cancer risk, many people do not want to know if they are at increased risk for developing a disease or illness. It may be that lifestyle changes (no smoking) and routine recommended medical screening test (colonoscopy, mammograms) may be the mainstay of medical follow up. There may be insurance coverage issues should a victim be determined to be at higher risk so that legal protection and privacy must be considered.
- **Recovery:** Decisions about reoccupation of the involved area, clean-up and even transient entry to remove valuables and personal items will be made by the local/regional government, expert consultants and citizens. The relative risks, expense,

time, and possibility for site clean up should be determined as clearly and as quickly as possible to expedite the community's recovery. Agencies involved in these discussions would be EPA, DHS, HHS and others.
- ESF #14 will assume a lead role as the recovery phase ramps up. Interagency PAGs should be consulted as in Table A6 (Draft PAGs from Federal Register).

Population Monitoring

What is the Role Specified in the National Response Framework for HHS?

- The text directly addressing this topic is found in the Nuclear/Radiological Incident Annex (June '08), page NUC-22, under "Population Monitoring" and "Population Decontamination" (emphasis added):
- "The Department of Health and Human Services (HHS), through ESF #8 - Public Health and Medical Services and in consultation with the coordinating agency, coordinates Federal support for external monitoring of people.
- HHS, through ESF #8 and in consultation with the coordinating agency, coordinates Federal support for population decontamination.
- HHS assists and supports State, tribal, and local governments in performing monitoring for internal contamination and administering available pharmaceuticals for internal decontamination, as deemed necessary by State health officials.
- HHS assists local and State health departments in establishing a registry of potentially exposed individuals, performing dose reconstruction, and conducting long-term monitoring of this population for potential long-term health effects."

What the Centers for Disease Control and Prevention (CDC) have done to date.

- CDC hosted a roundtable in Atlanta on population monitoring with participants from Federal agencies, state and local health departments, academia and many professional organizations.
- CDC chairs a small interagency working group of technical experts to discuss practical aspects of population monitoring. The working group has provided CDC with significant input on the topic.
- CDC has prepared a planning guide for state and local public health planners highlighting the many challenges in a mass casualty radiation incident and suggesting ways to address those challenges.
- CDC is preparing a public health toolkit with a video segment on population monitoring.

- CDC is planning on developing a planning decision tool (software) for optimizing the design and operation of community reception centers used to screen population in mass casualty radiation emergencies. This is based on the concept of PODs (points of dispensing) and will use field data on radiation screening.

What needs to be done next?

- Identify, and solidify Interagency Agreements with, Federal resources that can be made available to assist with population monitoring, i.e., clarify what constitutes the "Federal support" that HHS is responsible to coordinate.
- Remain proactive in coordinating with all identified resources. This includes the Commissioned Corps, Medical Reserve Corps, or other assets that can be used to assist with population monitoring. Coordination with all these resourced needs to be done proactively in the specific context of population monitoring.
- Conduct a national radiation exercise with an ESF #8 focus on Population Monitoring issues. To date, many radiation exercises conducted locally or nationally lack such emphasis. Population monitoring issues are especially overlooked and challenges underestimated.

Common response phase terminology

- **Phases of Response** (from Federal Register PAGs, January 2006). These are verbatim definitions. Note: our response plans are tied to hours/days after the event so that these terms are useful but not used specifically in our CONOPS.
    - **The early phase** (or emergency phase) is the period at the beginning of the incident when immediate decisions for effective use of protective actions are required and actual field measurement data is generally not available.
    - **The intermediate phase** of the response may follow the early phase response within as little as a few hours. The intermediate phase of the response is usually assumed to begin after the source and releases have been brought under control and protective action decisions can be made based on measurement of exposure and radioactive materials that have been deposited as a result of the incident.
    - **The late phase** is the period when recovery and cleanup actions designed to reduce radiation levels in the environment to acceptable level area commenced, and it ends when all the recovery actions have been completed.

National Planning Scenario #11

Casualties	180 fatalities 270 injuries 20,000 detectible contaminations (at each site)
Infrastructure Damage	Near the explosion
Evacuations/Displaced Persons	• 10,000 evacuated to shelters in safe areas (decontamination required prior to entering shelters) • 25,000 in each city are given shelter-in-place instructions • Hundreds of thousands self-evacuate from major urban areas in anticipation of future attacks
Contamination	36 city blocks (at each site)
Economic Impact	Up to billions of dollars
Potential for Multiple Events	Yes
Recovery Timeline	Months to years

Scenario Overview

General Description

In this scenario, the Universal Adversary (UA) purchases stolen cesium chloride (CsCl) to make a radiological dispersal device (RDD), or "dirty bomb." The explosive and the shielded cesium-137 (^{137}Cs) sources are smuggled into the Country. Detonator cord is stolen from a mining operation, and all other materials are obtained legally in the United States. Devices are detonated in three separate, but regionally close, moderate-to-large cities.

^{137}Cs is mostly used in the form of CsCl because it is easy to precipitate. CsCl is a fairly fine, light powder with typical particle size median at about 300 microns. Fractions below 10 microns are typically less than 1%. In an RDD, most will fall out within approximately 1,000 to 2,000 feet (although many variables exist), but a small amount may be carried great distances, even hundreds of miles.

Detailed Attack Scenario

The UA, having learned from press and scientific reports how to make an RDD, activates a U.S.-based cell to carry out attacks on U.S. cities. The UA chooses ^{137}Cs because of its availability, high radioactivity, high dispersability, and the difficult nature of cleanup and remediation. The UA's goal is to conduct a highly visible attack creating fatalities, fear, and social and economic disruption.

The U.S. cell spends several years slowly acquiring a large quantity of prilled ammonium nitrate (NH_4NO_3). UA members plan attacks on three significant cities in regional proximity. Via black-market contacts, the foreign cell purchases three stolen seed irradiators that each contains approximately 2,300 curies of CsCl and several kilograms of highly explosive Pentaerythritol Tetranitrate (PETN). The CsCl powder is removed from its containment, transferred to plastic zip-lock bags, and placed in heavy lead-shielding containers. The explosive and the shielded ^{137}Cs sources are smuggled into the country in sea-land containers shipped separately to a U.S. port under assumed business names. Detonator cord is stolen from a mining operation without raising concern, and all other materials are obtained legally in the United States.

The sea-land containers are picked up and transferred to safe houses near the target cities, where rented vans await containing the ammonium nitrate and containers of fuel oil. The vans have been painted to appear as commercial delivery vehicles. At the safe houses, terrorists assemble the devices by carefully mixing the Ammonium Nitrate with Fuel Oil (ANFO; 95:5 by weight) inside the truck and fixing the detonator with a 0.5-kilogram highly explosive core as a booster. The total explosive yield in each device will be approximately 3,000 pounds. Because each radiation source gives off 760 rad per hour (at 1 meter), the sources are left in their lead containers until the final minutes—at that time, they are transferred to the van and inserted down into the explosive mixture. The vans arrive at the target downtown locations in the U.S. cities. Three to five individuals are involved in executing each attack.

At 11:15 a.m. during the school year, UA members detonate the 3,000-pound truck bomb containing the 2,300 curies of ^{137}Cs in the downtown business district of City One. The explosion collapses the front of one building and causes severe damage to three others. Windows are blown out of five other buildings. The area is contaminated with ^{137}Cs, and the contaminated detonation aerosol is lifted more than 100 feet into the air.

A similar scene plays out in two other moderate-to-large cities. The second and third explosions are timed to go off simultaneously in City Two and City Three, at approximately 12:30 p.m. on the same day. The time lag is intended to maximize press coverage and spread fear and uncertainty. Local first-response capacity, however, is depleted in City Two and City Three, because many responder assets have been dispatched to assist nearby City One with the response.

Planning Considerations:

Geographical Considerations/Description

The three cities are regionally close. They are physically similar (for the sake of this assessment), with similar building environments and geographic topography that is essentially flat. The results in each city are essentially the same. The contaminated region covers approximately 36 blocks in each city and includes the business district (high-rise street canyons), residential row houses, crowded shopping areas, and a high school. Buildings in the affected areas are principally made of concrete and brick; some are stone faced. Building heights in the entire affected area range from 2 to 20 stories, and buildings in the immediate vicinity of the blast are 8 to 16 stories. The area within a radius of five blocks of the blast is a narrow urban canyon of medium-to-tall buildings abutting sidewalks, and streets are approximately 40 feet wide.

The entire scene is contaminated with ^{137}Cs, though not at levels causing immediate concern to first responders. Due to the size of the explosion, the radioactive contamination is blown widely such that the ground zero area is not as radioactive as might have been expected. The detonation aerosol contains 90% of the original ^{137}Cs source with radioactive particles whose sizes range from 1 to 150 microns—the size of most of the particles is approximately 100 microns. Larger particles either penetrate building materials in the blast zone or drop quickly to the ground as fallout within about 500 feet.

Variable winds of 3 to 8 miles per hour carry the radioactively contaminated aerosol throughout an area of approximately 36 blocks (the primary deposition zone). Complex urban wind patterns carry the contamination in unpredictable directions, leaving highly variable contamination deposition with numerous hot spots created by wind eddies and vortices. Radioactivity concentrations in this zone are on the order of 5 to 50 microcuries/m2, with hot spots measuring 100 to 500 microcuries/m2; however, traces of the ^{137}Cs plume carry more than 3.5 kilometers (~ 2.2 miles) on prevailing winds. Negative indoor building pressure draws radioactive aerosols into buildings via cracks around windows and doors. Exterior air intakes increase the contamination in the interior of larger buildings. In City One, the subway system is contaminated by radioactive aerosols entering through subway ventilation system air intakes.

In all cities, foot and vehicular traffic after deposition re-suspend and transfer contamination for hours afterward until the entire scene has been effectively controlled and cordoned, contributing to contamination spread beyond the 36-block primary deposition zone. People who were in the deposition zone also take contamination home with them in hair and clothing.

Timeline/Event Dynamics

The attacks have no advance notice or intelligence that indicates their possibility. The explosions are instantaneous, but plume dispersion continues for 20 minutes while breezes navigate the complex environments before particles have fully settled. First responders do not recognize radioactive contamination for 15 minutes in City One. The explosions in City Two and City Three are promptly identified as "dirty bombs"—this provides some advantage to first responders and government officials in managing contamination on-scene, and in communicating with the public concerning topical contamination and spread of contamination.

Assumptions

- As a result of the explosions, 90% of the 2,300-curies ^{137}Cs source is aerosolized and carried by winds, with radioactive particles ranging in size from 1 to 150 microns. The remaining fallout creates debris and contaminates surrounding structures.
- There is no precipitation. There are light, variable winds of 3 to 8 mph. The temperature is 65º F.
- The port of entry through which the smuggled materials enter is not equipped with radiation detection equipment that can detect the shielded ^{137}Cs source. The target and surrounding access routes are not equipped with radiation sensors that can detect the shielded source. The acquisition of bomb-making materials does not draw the attention of law enforcement.
- First responders from City Two and City Three assist City One.
- A disposal facility is available for cleaning up waste.

Mission Areas Activated

Prevention/Deterrence:

Prevention efforts should include such law enforcement goals as prevention of trafficking and importation of CsCl and weapon components, reconnaissance of the site, protection, and deterrence measures taken at the site before and during the attack. Target and surrounding access routes are not equipped with radiation sensors that can detect the shielded source. DHS would be involved in detection of the shielded ^{137}Cs radiation sources.

Emergency Assessment/Diagnosis:

The explosion in City One is not recognized as a "dirty bomb" until responding units arrive with gamma detection equipment. This leads to contamination of first responders and inadvertent contamination spread that might have otherwise been avoidable. The downwind aerosol dispersion will be a significant component of the hazard and will cause extended local and regional disruption. Actions of incident-site and EOC/Joint Field Office (JFO) personnel tested during and after the attack include providing personnel dispatch; assessing the extent of physical damage, including engineering assessments of buildings; assessing medical response needs; detecting and identifying the radiation source; establishing and preserving the site for crime scene analysis; collecting site data and information; making hazard assessments and predictions for responders and the public; and coordinating preliminary radiation monitoring, surveying, and sampling operations.

Emergency Management/Response:

Incidents result in 180 fatalities, 270 injuries, extensive environmental contamination, evacuation of thousands of individuals, and thousands of potentially exposed individuals in the downwind zone. Actions of EOC/JFO personnel required after the attack include mobilizing and operating incident command; overseeing victim triage; stabilizing the site; cordoning the site and managing and controlling the perimeter; providing notification and activation of special teams; providing traffic and access control; providing protection of at-risk and special populations; providing resource support and requests for assistance; providing public works coordination; providing direction and control of critical infrastructure mitigation; and providing public information, outreach, and communication activities.

Because first-responder assets (e.g., medical evacuation, fire, rescue, and EMS personnel) were promptly dispatched from nearby City Two and City Three to assist City One, City Two and City Three are low on response capacity, and officials find themselves unprepared when attacks strike their cities.

Hazard Mitigation:

Required actions of incident-site personnel include isolating the incident scene and defining the hazard areas, building stabilization, providing fire suppression, conducting debris management, conducting radioactive and hazardous contamination mitigation, decontaminating responders and equipment, conducting local-site contamination control, and decontaminating local citizens.

Evacuation/Shelter:

Evacuation and/or sheltering of downwind populations will be required. This must occur promptly and in an orderly fashion, but will likely not occur before the plume has passed and settled, given the lack of warning. Actions taken by Federal, State, and local EOC/JFO personnel performed after the attack include developing protective action recommendations and communicating them to the public (e.g., to evacuate the affected area and/or shelter-in-place, as appropriate, and self-decontamination); providing management of evacuation, whether ordered or spontaneous; protecting special populations, schools, and day care centers; establishing temporary sheltering alternatives and provision of food for evacuees; and offering veterinary services for pets.

Victim Care:

Injured people will require some decontamination in the course of medical treatment and, if possible, prior to hospital admission. Thousands more will likely need superficial decontamination and both short-term and long-term medical follow-ups. Actions of incident-site, local-area, hospital, and EOC/JFO personnel tested after the attack include conducting search and rescue; providing triage, emergency aid, treatment, and stabilization; decontaminating victims (ambulatory and non-ambulatory); establishing relief stations, impromptu decontamination centers, and site access portals; screening, monitoring, and decontaminating evacuees (numbers are expected to be up to 100,000 at each site); conducting victim/evacuee data and information collection and management; making radio-protective pharmaceutical decisions and efficiently providing protective and/or therapeutic drug administration; conducting patient status tracking and reporting; providing patient transport; treating ER walk-in radiation victims; providing hospital care; providing collection, decontamination, and cataloging of human remains and personal effects; and providing next-of-kin notification.

Investigation/Apprehension:

Actions of law enforcement personnel tested after the attacks include dispatching personnel, conducting site cordoning and control, collecting field data, conducting witness interviews, and performing tactical deployment and apprehension of suspects. Reconstruction of the attack will occur and will include information about the occurrence of importation of illicit materials, acquisition of materials within the United States, planning, movements, financial backing, communications, suppliers/accomplices tracking, and suspect apprehension.

Recovery/Remediation:

Decontamination/Cleanup: The extent of contamination will be a major challenge, because ^{137}Cs is highly water soluble and is chemically reactive with a wide variety of materials, including common building materials such as concrete and stone. Approximately 36 city blocks will be contaminated to varying degrees. Contamination will settle on streets, sidewalks, and building surfaces, and will be found in several kilometers of the subway system (City One). Building interiors will become contaminated due to ventilation systems, doors, windows (because negative building pressure can draw aerosols in through very small openings), and foot traffic. Personal property—including vehicles and items inside buildings—will also become contaminated, but many items can be adequately decontaminated for free release.

A summary of decontamination and cleanup activities is as follows:

- Some demolition will likely be required, but most surfaces may be systematically decontaminated to low levels (a lengthy, costly process).
- Officials may focus decontamination work first on critical infrastructure—such as major thoroughfares, the subway, and the water treatment plant—in order to restore basic functions as quickly as possible.
- Streets with cracks are cut, refilled, and resurfaced; some must be completely removed and repaved.
- Most sidewalks must be surface cleaned.
- Roofing materials are mostly removed, and roofs are resurfaced.
- Surface soil and vegetation are removed for disposal and replaced with fresh material.
- Exterior surfaces are decontaminated with an assortment of chemical treatments (e.g., stripping, vacuum blasting, scabbling), and collected wastes are hauled off for disposal.
- Contaminated building interiors are mostly stripped of surface coatings, carpet, drapery, furniture, etc., and are refurbished.

- Workers try to capture decontamination wastes for disposal, but much will escape into storm drains with each spring rain. Sewers become contaminated. Some are cleaned of hot spots, but others may be left fairly contained if cleaning them is not justified.
- Though concentrations are low, river sediment remediation will likely become a big issue with the public.

Site Restoration: Several buildings (those most damaged) will be torn down and eventually rebuilt. Decontamination activities are undertaken for building exteriors and interiors, streets, sidewalks, and other areas. Federal, State, and local officials and stakeholders hold numerous public meetings to evaluate current and future land use goals, dose/risk goals for the site, and the possible use of institutional controls if decontamination is unsatisfactory. Economic and tax incentives may need to be instituted, and Federal, State, and local governments might start a "save our city" campaign to build community support to reclaim and revitalize the area. (A heated debate is likely to ensue in public meetings and the press over the adequacy of site restoration goals and the resultant risks to the public, presenting major communication and negotiation challenges to local, State, and Federal officials.)

Implications

Secondary Hazards/Events

Small fires from ruptured gas lines occur in the vicinity of the blasts. Unstable building facades, rubble, and broken glass create physical hazards for rescue workers. Small amounts of lead, asbestos, and Polychlorinated Biphenyls (PCBs) are present in the air and on surfaces. Human remains present a biohazard, and some of these may be radioactive.

Fatalities/Injuries

At each site, the blast results in 180 fatalities and about 270 injured requiring medical care. In addition, up to 20,000 individuals in each primary deposition zone potentially have detectable superficial radioactive contamination. Most of them also have internal contamination via inhalation and secondary ingestion. Most cases are seen in City One. In each city, tens of thousands of people located downwind have minor external and internal contamination and will require monitoring and medical surveillance.

Property Damage

In each blast, one building and 20 vehicles are destroyed (i.e., not salvageable), and eight other buildings suffer varying degrees of damage, such as minor structural damage and broken windows. Radioactive contamination is found inside buildings as well as on building exteriors, streets, sidewalks, people, and personal property over an area of approximately 36 blocks in each city. Minor contamination may be an issue further downwind as investigators perform more thorough surveys. Most of the subway system in City One is contaminated.

Over the long term, decontamination efforts are expected to be effective, but some property owners choose demolition and rebuilding. Many square blocks will be unavailable to businesses and residents for several years until remediation is completed.

Service Disruption

Transportation is severely hampered in each city. Bus, rail, and air transportation routes are altered, and officials build highway checkpoints to monitor incoming traffic for contamination. The subway system in City One, which carries 500,000 passengers a day, is completely or partially closed for an extended period. In each city, the entire contaminated zone is closed to all traffic for an extended period (though peripheral areas and some thoroughfares are opened within several weeks for limited use). Hospitals in each region, already at maximum capacity with injuries from the blasts, are inundated with up to 50,000 “worried well,” most of whom were not in the blast or plume zone but are concerned about health issues (despite special relief stations established by the incident command for contamination monitoring and public outreach).

The sewage treatment plant is quickly contaminated as a result of people showering and decontaminating personal effects. In each city, 75 businesses are closed for an extended duration while radioactive contamination is remediated. Local tax revenues plummet, and people discover that insurance claims are rejected. The schools in the contamination zones are closed, and students meet in alternate locations. Nearby towns and cities close their doors to residents of the impacted cities for fear of contamination spread. Bus, rail, and air transportation routes are altered, and officials build highway checkpoints to monitor incoming traffic for contamination.

If one of the events occurred near a border, there would be a need for intense communication and cooperation between the two border governments that would engage their respective foreign affairs organizations and the full range of other Federal, State, and local agencies. In addition, the RDD attacks may warrant limiting access to or closing U.S. borders, which would have an immediate effect on Mexico and Canada.

Economic Impact

Although technologies exist to decontaminate areas, these technologies were designed for smaller, isolated areas, and the process may take several years. Decontamination, destruction, disposal, and replacement of lost infrastructure will be costly (i.e., hundreds of millions of dollars per site). Economic losses in the area due to lost business productivity, tax revenue, and property will be significant. The entire contaminated area may be economically depressed for years.

Additionally, an overall national economic downturn may occur in the wake of the attack due to a loss of consumer confidence. Virtually all commercial insurance policies exclude radioactive contamination, so the Federal Government will be left with a massive bailout. Total economic impacts would almost certainly be in the billions of dollars. Some residents will show no signs of willingness to resettle their former domiciles. Schools may permanently relocate. Some businesses may relocate to an unaffected zone or another city altogether. However, depending on the city; its size; and its historical, economic, and political significance, the will to recover and repopulate would vary widely from long-term decline to complete revitalization.

Long-Term Health Issues

The following is a summary of human health issues likely to occur over the long term:

- No one will suffer acute radiation syndrome.
- Approximately 20,000 individuals are likely to become externally contaminated at each site. A high percentage of these (perhaps 40% to 60%) will have measurable internal contamination via inhalation and primary and secondary ingestions that require treatment. Low-level contamination may enter food and water supplies and may be consumed at projected doses below EPA Protective Action Recommendations. The sum of the cumulative exposures results in an increased lifetime cancer risk proportionate to the dose.
- All exposed individuals will need to be monitored for health outcomes over their lifetimes, especially those that suffer internal contamination.
- Many individuals, including those close to but not within the affected area, will require mental health counseling for an extended period of time. First responders make up a unique group often in need of mental health services. The total number in need of mental health services may be on the order of 5,000 to 20,000 per site.

National Planning Scenario #11

Casualties	180 fatalities 270 injuries 20,000 detectible contaminations (at each site)
Infrastructure Damage	Near the explosion
Evacuations/Displaced Persons	• 10,000 evacuated to shelters in safe areas (decontamination required prior to entering shelters) • 25,000 in each city are given shelter-in-place instructions • Hundreds of thousands self-evacuate from major urban areas in anticipation of future attacks
Contamination	36 city blocks (at each site)
Economic Impact	Up to billions of dollars
Potential for Multiple Events	Yes
Recovery Timeline	Months to years

Scenario Overview

General Description

In this scenario, the Universal Adversary (UA) purchases stolen cesium chloride (CsCl) to make a radiological dispersal device (RDD), or “dirty bomb.” The explosive and the shielded cesium-137 (^{137}Cs) sources are smuggled into the Country. Detonator cord is stolen from a mining operation, and all other materials are obtained legally in the United States. Devices are detonated in three separate, but regionally close, moderate-to-large cities.

^{137}Cs is mostly used in the form of CsCl because it is easy to precipitate. CsCl is a fairly fine, light powder with typical particle size median at about 300 microns. Fractions below 10 microns are typically less than 1%. In an RDD, most will fall out within approximately 1,000 to 2,000 feet (although many variables exist), but a small amount may be carried great distances, even hundreds of miles.

Detailed Attack Scenario

The UA, having learned from press and scientific reports how to make an RDD, activates a U.S.-based cell to carry out attacks on U.S. cities. The UA chooses ^{137}Cs because of its availability, high radioactivity, high dispersability, and the difficult nature of cleanup and remediation. The UA's goal is to conduct a highly visible attack creating fatalities, fear, and social and economic disruption.

The U.S. cell spends several years slowly acquiring a large quantity of prilled ammonium nitrate (NH_4NO_3). UA members plan attacks on three significant cities in regional proximity. Via black-market contacts, the foreign cell purchases three stolen seed irradiators that each contains approximately 2,300 curies of CsCl and several kilograms of highly explosive Pentaerythritol Tetranitrate (PETN). The CsCl powder is removed from its containment, transferred to plastic zip-lock bags, and placed in heavy lead-shielding containers. The explosive and the shielded ^{137}Cs sources are smuggled into the country in sea-land containers shipped separately to a U.S. port under assumed business names. Detonator cord is stolen from a mining operation without raising concern, and all other materials are obtained legally in the United States.

The sea-land containers are picked up and transferred to safe houses near the target cities, where rented vans await containing the ammonium nitrate and containers of fuel oil. The vans have been painted to appear as commercial delivery vehicles. At the safe houses, terrorists assemble the devices by carefully mixing the Ammonium Nitrate with Fuel Oil (ANFO; 95:5 by weight) inside the truck and fixing the detonator with a 0.5-kilogram highly explosive core as a booster. The total explosive yield in each device will be approximately 3,000 pounds. Because each radiation source gives off 760 rad per hour (at 1 meter), the sources are left in their lead containers until the final minutes—at that time, they are transferred to the van and inserted down into the explosive mixture. The vans arrive at the target downtown locations in the U.S. cities. Three to five individuals are involved in executing each attack.

At 11:15 a.m. during the school year, UA members detonate the 3,000-pound truck bomb containing the 2,300 curies of ^{137}Cs in the downtown business district of City One. The explosion collapses the front of one building and causes severe damage to three others. Windows are blown out of five other buildings. The area is contaminated with ^{137}Cs, and the contaminated detonation aerosol is lifted more than 100 feet into the air.

A similar scene plays out in two other moderate-to-large cities. The second and third explosions are timed to go off simultaneously in City Two and City Three, at approximately 12:30 p.m. on the same day. The time lag is intended to maximize press coverage and spread fear and uncertainty. Local first-response capacity, however, is depleted in City Two and City Three, because many responder assets have been dispatched to assist nearby City One with the response.

Planning Considerations:

Geographical Considerations/Description

The three cities are regionally close. They are physically similar (for the sake of this assessment), with similar building environments and geographic topography that is essentially flat. The results in each city are essentially the same. The contaminated region covers approximately 36 blocks in each city and includes the business district (high-rise street canyons), residential row houses, crowded shopping areas, and a high school. Buildings in the affected areas are principally made of concrete and brick; some are stone faced. Building heights in the entire affected area range from 2 to 20 stories, and buildings in the immediate vicinity of the blast are 8 to 16 stories. The area within a radius of five blocks of the blast is a narrow urban canyon of medium-to-tall buildings abutting sidewalks, and streets are approximately 40 feet wide.

The entire scene is contaminated with ^{137}Cs, though not at levels causing immediate concern to first responders. Due to the size of the explosion, the radioactive contamination is blown widely such that the ground zero area is not as radioactive as might have been expected. The detonation aerosol contains 90% of the original ^{137}Cs source with radioactive particles whose sizes range from 1 to 150 microns—the size of most of the particles is approximately 100 microns. Larger particles either penetrate building materials in the blast zone or drop quickly to the ground as fallout within about 500 feet.

Variable winds of 3 to 8 miles per hour carry the radioactively contaminated aerosol throughout an area of approximately 36 blocks (the primary deposition zone). Complex urban wind patterns carry the contamination in unpredictable directions, leaving highly variable contamination deposition with numerous hot spots created by wind eddies and vortices. Radioactivity concentrations in this zone are on the order of 5 to 50 microcuries/m2, with hot spots measuring 100 to 500 microcuries/m2; however, traces of the ^{137}Cs plume carry more than 3.5 kilometers (~ 2.2 miles) on prevailing winds. Negative indoor building pressure draws radioactive aerosols into buildings via cracks around windows and doors. Exterior air intakes increase the contamination in the interior of larger buildings. In City One, the subway system is contaminated by radioactive aerosols entering through subway ventilation system air intakes.

In all cities, foot and vehicular traffic after deposition re-suspend and transfer contamination for hours afterward until the entire scene has been effectively controlled and cordoned, contributing to contamination spread beyond the 36-block primary deposition zone. People who were in the deposition zone also take contamination home with them in hair and clothing.

Timeline/Event Dynamics

The attacks have no advance notice or intelligence that indicates their possibility. The explosions are instantaneous, but plume dispersion continues for 20 minutes while breezes navigate the complex environments before particles have fully settled. First responders do not recognize radioactive contamination for 15 minutes in City One. The explosions in City Two and City Three are promptly identified as "dirty bombs"—this provides some advantage to first responders and government officials in managing contamination on-scene, and in communicating with the public concerning topical contamination and spread of contamination.

Assumptions

- As a result of the explosions, 90% of the 2,300-curies ^{137}Cs source is aerosolized and carried by winds, with radioactive particles ranging in size from 1 to 150 microns. The remaining fallout creates debris and contaminates surrounding structures.
- There is no precipitation. There are light, variable winds of 3 to 8 mph. The temperature is 65º F.
- The port of entry through which the smuggled materials enter is not equipped with radiation detection equipment that can detect the shielded ^{137}Cs source. The target and surrounding access routes are not equipped with radiation sensors that can detect the shielded source. The acquisition of bomb-making materials does not draw the attention of law enforcement.
- First responders from City Two and City Three assist City One.
- A disposal facility is available for cleaning up waste.

Mission Areas Activated

Prevention/Deterrence:

Prevention efforts should include such law enforcement goals as prevention of trafficking and importation of CsCl and weapon components, reconnaissance of the site, protection, and deterrence measures taken at the site before and during the attack. Target and surrounding access

routes are not equipped with radiation sensors that can detect the shielded source. DHS would be involved in detection of the shielded ^{137}Cs radiation sources.

Emergency Assessment/Diagnosis:

The explosion in City One is not recognized as a “dirty bomb” until responding units arrive with gamma detection equipment. This leads to contamination of first responders and inadvertent contamination spread that might have otherwise been avoidable. The downwind aerosol dispersion will be a significant component of the hazard and will cause extended local and regional disruption. Actions of incident-site and EOC/Joint Field Office (JFO) personnel tested during and after the attack include providing personnel dispatch; assessing the extent of physical damage, including engineering assessments of buildings; assessing medical response needs; detecting and identifying the radiation source; establishing and preserving the site for crime scene analysis; collecting site data and information; making hazard assessments and predictions for responders and the public; and coordinating preliminary radiation monitoring, surveying, and sampling operations.

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Required actions of incident-site personnel include isolating the incident scene and defining the hazard areas, building stabilization, providing fire suppression, conducting debris management, conducting radioactive and hazardous contamination mitigation, decontaminating responders and equipment, conducting local-site contamination control, and decontaminating local citizens.

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If one of the events occurred near a border, there would be a need for intense communication and cooperation between the two border governments that would engage their respective foreign affairs organizations and the full range of other Federal, State, and local agencies. In addition, the RDD attacks may warrant limiting access to or closing U.S. borders, which would have an immediate effect on Mexico and Canada.

Economic Impact

Although technologies exist to decontaminate areas, these technologies were designed for smaller, isolated areas, and the process may take several years. Decontamination, destruction, disposal, and replacement of lost infrastructure will be costly (i.e., hundreds of millions of dollars per site). Economic losses in the area due to lost business productivity, tax revenue, and property will be significant. The entire contaminated area may be economically depressed for years.

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The following is a summary of human health issues likely to occur over the long term:

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- All exposed individuals will need to be monitored for health outcomes over their lifetimes, especially those that suffer internal contamination.
- Many individuals, including those close to but not within the affected area, will require mental health counseling for an extended period of time. First responders make up a unique group often in need of mental health services. The total number in need of mental health services may be on the order of 5,000 to 20,000 per site.

Concept of Operations

The CONOPS of an Explosive RDD, non-Explosive RDD and RED have much in common. To avoid excess duplication and to emphasize the commonality, the CONOPS uses the following organization:

*Tasks are organized as in the ESF#8 Section of the National Response Framework.

*Non-boxed text is common to all scenarios.

CONOPS for Explosive RDDs is in the red framed box

CONOPS for non-explosive RDDs (NERDD) and Radiological Exposure Devices (RED) is in the blue framed box

As in the introduction, non-essential points are in the gray box

ESF #8 Missions: Initial Actions and Continuing Actions

Assessment of Public Health / Medical Needs

HHS, in collaboration with DHS, mobilizes and deploys ESF #8 personnel to support the ERT-A to assess public health and medical needs. This function includes the assessment of the public health care system/facility infrastructure.

Once the severity and scope of the Explosive RDD has been determined, HHS will deploy personnel including as appropriate from USPHS and, NDMS. In addition, civilian assets from the Medical Reserve Corps (MRC) may be requested to support the immediate and continuing staffing needs of providing health care to victims of the incident.

An RDD/IED will cause a surge in victims of blast injuries, burns and radiological exposure and/or contamination. HHS with the assistance of DOD, DOE (FRMAC), IMAAC, and local government will evaluate the size of blast, radiological dispersal, type of radionuclide(s), number of injuries and categories of injuries. HHS will evaluate the numbers and types of victims and along with the local/state/regional/tribal officials determine the effect on local and regional healthcare. HHS (Interagency A-Team) along with DOE (IMAAC and FRMAC),working with the Advisory Team (A-Team) will make recommendations to local and regional responders regarding radiation zones and advise on specific medical countermeasures. HHS will work with local/regional responders and healthcare systems to provide assets to help with surge capacity. The number of victims needing immediate medical intervention could be in the hundreds to a few thousand while the number needing some evaluation, appropriate assurance, and possible long-term epidemiological follow-up may be in the tens of thousands. Subsequently, HHS will determine the most appropriate public health and medical assets and their timing of deployment from among the USPHS Rapid Deployment Force, Commissioned Corps, NDMS assets and more. If appropriate, HHS will deliver countermeasures from the SNS.

A non-explosive RDD/Radiation Exposure Device NERDD/RED unlike an RDD/IED, which is identified by an explosion, may not be identified until epidemiological evidence is recognized as a covert radiological attack. Thus, a time Zero might never be known with certainty. As a result, the potential number of concerned persons could be exceedingly large and there may be a large requirement for triage and, in the long-term, epidemiological follow-up. Much of the triage will be done by medical history but some medical (blood, urine or tissue) analysis may be needed, likely requiring very specialized laboratories. The number of people requiring immediate medical intervention will likely be in the hundreds to few thousand. Public messaging and effective triage will mitigate potential surge of concerned citizens and allow for identification of injured persons at highest risk from radiological contamination or exposure. The potential build-up of victims from radiological exposure over time (as a result of non-detection) means that large numbers of actual victims requiring care, most likely for non-lethal exposures or contamination, will have to be addressed. In the same way as with an RDD, HHS will assist in the evaluation of potential victims, assess the magnitude of the ongoing incident and then send in appropriate federal resources to reduce surge and help deliver and/or resupply countermeasures.

Health Surveillance

HHS, in coordination with State health agencies, enhances existing surveillance systems to monitor the health of the general population and special high-risk (sic [at-risk]) population, field studies and investigations, monitor injury and disease patterns and potential disease outbreaks, provide technical assistance and consultations on disease and injury prevention and precautions.

HHS will develop and institute a Population Monitoring Plan with CDC, NCI, USPHS or other designated experts. Identification and evaluation of victims of radiological exposure or contamination who may have long term risk of developing radiation-induced cancer, may require a long term monitoring program as an [recovery phase] extension of a victim registry, either through local and/or HHS experts. This is in addition to personnel to support the treatment of patients with obvious radiological injury. A key determinate for the volume of people needing assessment and possible long-term monitoring will be the dose cut off, likely above 50 or even 100 rem, but that remains to be determined at the incident.

The covert nature of an NERDD or RED means that surveillance of victims will require effective triage as to who needs medical intervention and who needs only follow-on monitoring. This might occur at multiple locations for a covert contamination (e.g. water supply). Those who are exposed to radiation or radiological contamination may require long term monitoring as with explosive RDD.

Medical Care Personnel

Immediate medical response capabilities are provided by assets internal to HHS (e.g., U.S. Public Health Service Commissioned Corps) and from ESF #8 supporting organizations (e.g., National Disaster Medical System (NDMS) [part of HHS], and Veteran Administration healthcare professionals). The Department of Defense (DOD) may be requested to provide support in casualty clearing/staging and other missions as needed. HHS may seek individual clinical health and medical care specialists from the Department of Veterans Affairs (VA) to assist State, local and tribal personnel.

Once HHS has evaluated the situation of an RDD/IED, the USPHS, NDMS, DMAT and FMS may be utilized accordingly for immediate, mid-term, and long term response/recovery. The nature of an RDD/IED requires immediate response capabilities that will be mostly provided by local response, aided by local federal assets. HHS will deploy Federal capabilities as appropriate to support the response. Potential uses, even for small events, would be to help with medical care for displaced individuals, assist in triage for potential exposure, assist with medical countermeasure administration and help establish a program for long-term follow-up. DOD has an even longer response time and may only be needed if the RDD incident is large enough that DOD response assets are still required on-scene after day five. Local DOD and VA medical centers will be requested to support surge of victims from an RDD/IED.

The NERDD/RED may not have an immediate indicator of radiological attack, although some scenarios (e.g. radiation in a ventilation system of a public building) may be obvious and have numerous seriously ill victims. HHS assets will be needed once the radiological incident is realized. Because of the potential for large numbers of concerned citizens following a covert attack, the requirement for immediate response assets may be much larger than for an RDD/IED. HHS will employ USPHS, NDMS, DMAT and FMS accordingly to best address the needs of the community during the response. Although HHS may not be able to support the early phase of the response, HHS can support the intermediate phase by providing surge capacity and potentially reducing surge numbers by strong public messaging regarding self-assessment for radiological injury or contamination. Key personnel might be those needed for epidemiological studies and local/regional education of concerned citizens, as opposed to those directly involved in medical care.

Health/Medical Equipment and Supplies

In addition to deploying assets from the Strategic National Stockpile (SNS), HHS may request DHS, DOD, or the VA to provide medical equipment and supplies, including medical, diagnostic, and radiation-emitting devices, pharmaceuticals, and biologic products in support of immediate medical response operations and for restocking health care facilities in an area affected by a major disaster or emergency.

A blast such as an RDD/IED will require medical supplies to treat burn, physical trauma, and radiation exposure and radiological contamination. These supplies are available through the Strategic National Stockpile via Supplier Managed Inventory (SMI), Vendor Managed Inventory (VMI) pre-positioned assets such as 12-hour push packs (including antibiotics and burn and trauma care supplies) and materiel stored at central SNS locations. The equipment and supplies will be for the blast as well as medical countermeasures for the radionuclide, if needed. Special diagnostic equipment may be needed for bioassay and biodosimetry and special transport of specimens to CDC or biodosimetry labs may be needed (likely by commercial shipper). Since many of the radionuclide specific treatments are FDA approved, they may already be forward deployed in the local/regional hospitals or storage places so that the SNS will assist in surge capacity and restocking. If needed, HHS may request support from the VA National Acquisition Center (via SNS), DOD and DOT for transport. As necessary, FMS and NDMS assets will be deployed to support healthcare in the region, and potentially displaced population. Additionally, the developing concept of a Virtual SNS would support surge requirements.

The Virtual SNS or User-Managed Inventory (UMI)
UMI is a theoretical system under consideration where hospitals, distributors, manufacturers, etc., move equipment, supplies, and pharmaceuticals accordingly, to support the surge requirements of the response to any event or incident. The primary component of the Virtual SNS comprises hospitals and local, regional entities that stockpile additional amounts of equipment, supplies, and pharmaceuticals as a "bubble in their pipeline" above and beyond the daily requirements of the facility. Essentially, they create a miniature SNS within the facility and along with that of their partners in the region create a Virtual SNS.

The population affected by a NERDD or RED will likely require medical countermeasures to block radionuclides or, mitigate or treat the effects of radiation exposure/contamination. Like the RDD/IED, the SNS can support these requirements aided by VA, DOD, and DOT as needed. Additionally, the Virtual SNS can be used as needed. A NERDD incident may require both countermeasures for exposure to radiation and internal radiological contamination. Special diagnostic equipment may be needed for bio-assay and biodosimetry and special transport of specimens to CDC or biodosimetry labs may be needed (likely by commercial shipper). A RED incident will likely only require countermeasure for radiation exposure, because internal contamination would not occur.

Patient Evacuation [Medical]

In accordance with the NDMS four partner agreement, at the request of HHS, DOD coordinates with FEMA and DOT (ESF #1) – Transportation to provide support for the evacuation of seriously ill or injured patients to locations where hospital care or outpatient services are available. DOD is responsible for regulating and tracking patients transported on DOD assets to appropriate treatment facilities (e.g., NDMS non-Federal hospitals).

A modest sized RDD/IED will likely be accommodated largely by local/regional facilities. If surge exceeds capacity for the local and regional response whether for patients generally or for specific types of patients, such as radiation victims or burn victims, HHS will support the patient transport to definitive care centers including the RITN (Radiation Injury Treatment Network). Additionally, transport of primary care patients, or low acuity patients to offload surge in the locale will be facilitated with the support of HHS, DOD, and DOT as needed. DOD will require victim decontamination prior to transportation.

A NERDD/RED will not likely be of sufficient size to require evacuation. Although the concerned population may cause an unmanageable surge, the local and regional governments can support evacuation as needed. HHS will support patient transport to definitive care as needed, as might be the case for radiation injury and/or radiation decorporation. The transport of primary care populations or low acuity or chronic populations will support reducing surge in the locale and region by releasing more assets and personnel to respond to the incident.

Patient Care

HHS may task its components and the Medical Reserve Corps [activated by SEC HHS], and request the Medical Reserve Corps [activated by SEC HHS], VA, DOD, and DHS to provide available personnel to support inpatient hospital care and outpatient services to victims who become seriously ill or injured regardless of location (which may include mass care shelters).

The RDFs and DMATs are HHS primary capabilities for timely response to an RDD/IED incident. These teams deliver strike medical care and triage capability. As the response to an RDD/IED progresses, additional HHS capabilities such as USPHS may be deployed as needed to support the response. FMS may be needed for large events to either offload lower acuity patients from local hospitals or to care for moderately ill victims. The Radiation Injury Treatment Network (RITN) will provide a surge capability for expert treatment of victims of radiation exposure or contamination. Special diagnostics may be needed for radiobioassay and biodosimetry as noted in Supplies Section.

Like an RDD/IED, RDF teams and DMATs provide a strike capability to manage the potential surge from concerned persons. As the magnitude of an NERDD/RED is determined, HHS will utilize the USPHS and NDMS assets accordingly to support patient surge and definitive care. FMS may be used to support care for low-acuity patients. Special diagnostics may be needed for radiobioassay and biodosimetry as noted in Supplies. The RITN will also be useful in the management and treatment of radiation victims.

Safety and Security of Human Drugs, Biologics, Medical Devices, and Veterinary Drugs, etc.

HHS may task its components to ensure the safety, efficacy, and advise industry on security measures of regulated human and veterinary drugs, biologics (including blood and vaccines), medical devices (including radiation emitting and screening devices), and other HHS regulated products.

As of July 2007, the decorporation and blocking agents are FDA approved. Drugs for acute radiation syndrome would require an Emergency Use Authorization (EUA).

This is the same as RDD/IED

Blood and Blood Products

HHS monitors blood availability and maintains contact with the American Association of Blood Banks Interorganizational Task Force on Domestic Disasters and Acts of Terrorism and, as necessary, its individual members, to determine:

- The need for blood, blood products, and the supplies used for their preparation, testing, and storage;
- The ability of existing supply chain resources to meet these needs; and
- Any emergency measures needed to augment or replenish existing supplies.

An RDD/IED will have blood requirements for trauma from the blast of an IED. These requirements will be met, if possible, by organizations in the Blood Bank community locally and regionally. Over time, other national entities may support blood requirements in the locale of the incident or as patients are transported to definitive care. In the dose range of an RDD, any marrow failure would likely take weeks to develop. The amount of blood and blood products (primarily platelets) required is dependent on the magnitude of the blast. For victims with potential ARS, it is critical that blood products be irradiated.

A NERDD/RED event has no requirements for blood or blood products except in the case of severe marrow injury. While radiation marrow injury takes weeks to fully develop, the time zero of a NERDD/RED may not be known so that victims may present with marrow failure. These requirements will be supported by the RITN (Radiation Injury Treatment Network) which will need HHS supported transport for the victims.

Food Safety and Security

HHS, in cooperation with ESF #11, may task its components to ensure the safety and security of federally regulated foods. (Note: HHS, through the Food and Drug Administration (FDA), has statutory authority for all domestic and imported food except meat, poultry, and egg products, which are under the authority of the USDA/Food Safety and Inspection Service.)

Radioactive contamination of food would be highly unlikely. Good public messaging will address the fact that the amount of radioactive materials in an RDD are unlikely to be a threat to a large water source such as a reservoir. However, the FDA, USDA and EPA should be aware of potential contamination and any regulatory messages that are necessary to protect the local/regional population.

NERDDs/REDs are of great concern for ensuring food and water safety even in the case of general (non-targeted) release of radioactive materials. NERDD incidents that specifically target food, milk or water sources could potentially paralyze a community or industry. Therefore, it is essential that upon determination of an NERDD, that HHS (FDA) aggressively seek identification of potential food, milk, or water source contamination with the assistance of EPA, USDA and the A-Team.

Agriculture Safety and Security

HHS, in coordination with ESF #11, may task its components to ensure the safety and security of food-producing animals, animal feed, and therapeutics. (Note: HHS, through the FDA, has statutory authority for animal feed and for the approval of animal drugs intended for both therapeutic and non-therapeutic use in food animals as well as companion animals.)

(See Food Safety and Security, above): It is unlikely any stock animal or animal food and water supply with be contaminated with an RDD/IED because the plume from an explosion is limited in size and strength, however, FDA, USDA, and EPA should assess suspected contamination. Coordination of recommendations and messaging is essential.

(See Food Safety and Security, above): Additionally, assessing the food and water supply for stock animals is important to prevent contamination of the food, milk, and water supply. FDA should work with USDA, and EPA to determine all aspects of food and water supplies are contamination free.

Worker Health/Safety

HHS may request the Department of Labor/Occupational Safety and Health Administration (DOL/OSHA) to implement the processes in the Worker Safety and Health Support Annex to provide technical assistance for worker safety and health. HHS may task its components and request support from DOL and other cooperating agencies, as needed, to assist in monitoring the health and well-being of emergency workers; performing field investigations and studies addressing worker health and safety issues; and providing technical assistance and consultation on worker health and safety measures and precautions.

DHS has released to the Federal Register, Interagency Protective Action Guidelines (PAGs). HHS/National Institute for Occupational Safety and Health (NIOSH) should work with EPA, OSHA, NRC, and DHS (which disseminates the information) to help the local community determine the PAGs they will use for workers with potential exposure to radiological contamination. If possible, these should be determined in advance and in the absence of such determination the PAGs in this Playbook should probably be used initially. Worker safety is a critical component of this event and the fear of radiation is what makes RDD a weapon of mass disruption. Additionally, HHS should work with the local/regional/state authorities to develop a process for monitoring radiation exposure and managing workers with exposure which may be a long-term program. State and local authorities may have different PAGs.

Once the NERDD/RED incident has been characterized NIOSH (HHS) should work with EPA, NRC, OSHA, FDA to determine potential exposure and PAGs for exposure to radioactive contamination. These determinations should be provided to DHS for dissemination. As needed, HHS will work with local/regional/state and tribal authorities to establish a monitoring system to assess potential radiation injuries in workers.

All-Hazard Public Health and Medical Consultation, Technical Assistance, and Support:

HHS may task its components to assist in assessing public health and medical effects resulting from all hazards. Such tasks may include assessing exposures on the general population and on high-risk (sic [at-risk]) population groups; conducting field investigations, including collection and analysis of relevant samples; providing advice on protective actions related to direct human and animal exposures, and on indirect exposure through contaminated food, drugs, water supply, and other media; and providing technical assistance and consultation on medical treatment, screening, and decontamination of injured or contaminated individuals. While State and local [Tribal] governments retain primary responsibility for victim screening and decontamination, ESF #8 can, at the request of a State or another Federal agency, deploy teams with

limited capabilities for victim decontamination (e.g., NDMS, or DOE assistance for nuclear/radiological incidents). These teams typically arrive on scene within 24- 48 hours.

HHS will coordinate and provide guidance for decontamination of radiological contamination and decorporation. HHS has experts at NIH, NIOSH, CDC and ASPR and extensive, up-to-date information is on REMM. Diagnostic assessment of potential exposures to populations are supported by CDC (bioassay) AFRRI (DOD) and REAC/TS (DOE). At present, capacity for radiobioassay and biodosimetry is very limited.

- External monitoring and decontamination of possibly affected victims are accomplished locally and are the responsibility of State, local, and tribal governments. Federal resources are provided at the request of, and in support of, the affected State(s). HHS, through ESF #8 and in consultation with the coordinating agency, coordinates Federal support for external monitoring of people and decontamination.
- HHS assists and supports State, local, and tribal governments in performing monitoring for internal contamination and administering available pharmaceuticals for internal decontamination, as deemed necessary by State health officials.
- HHS assists local and State health departments in establishing a registry of potentially exposed individuals, perform dose reconstruction, and conduct long-term monitoring of this population for potential long-term health effects.

See RDD/IED. RED incidents will rarely have any contamination requirements.

Behavioral Health Care

HHS may task its components to assist in assessing mental health and substance abuse needs; providing disaster mental health training materials for workers; providing liaison with assessment, training, and program development activities undertaken by Federal, State, local, and tribal mental health and substance abuse officials; and providing additional consultation as needed.

RDD/IED incidents will likely generate a great deal of fear surrounding concerns of radiological injury or contamination. Additionally, the behavioral response to such a terrorist incident is unpredictable and will require mental health professionals to assist the population in coping with such an event. Substance Abuse and Mental Health Services Administration (SAMHSA) and the Administration for Children & Families (ACF) provide human services such as crisis counseling that support the behavioral response. The provision of accurate, understandable information to the affected populations is the most important behavioral health intervention. Providing consultation to primary care providers on strategies for managing fear in those who perceive themselves as being at risk is another valuable contribution. ACF provides crisis counseling only.

NERDD/RED incidents are similar to RDD/IED, however, NERDD/RED incidents can potentially generate huge large populations of concerned persons due to the covert nature of NERDD/RDD. As a result the demands for behavioral management may be much greater than for an RDD/IED. These are likely to be long-lasting needs that may be lessened by having excellent epidemiology studies.

Public Health and Medical Information

HHS may task its components to provide public health, disease, and injury prevention information that can be transmitted to members of the general public who are located in or near areas affected.

In all events, public health and medical information should be transmitted via DHS. This enables the Federal government to align all public messages and ensures no confusion is generated from external communication sources. PAGs, backgrounds, technical documents and instructional messages are currently available from ASPR, CDC for many incidents and on the internet and through REMM. While the public media will likely have its own expert opinions, referring them to REMM may help minimize conflicting messages

See RDD/IED above.

Vector Control

HHS may task its components and request assistance from other ESF #8 organizations, as appropriate, to assist in assessing the threat of vector-borne diseases; conducting field investigations, including the collection and laboratory analysis of relevant samples; providing vector control

equipment and supplies; providing technical assistance and consultation on protective actions regarding vector-borne diseases; and providing technical assistance and consultation on medical treatment of victims of vector-borne diseases.

There are no vector concerns with an improvised explosive radiological dispersal device; however, radiological contamination is a concern and like vectors, requires certain actions to prevent the spread of radiological contamination. This is achieved by strong public messages that inform potential victims (including those with pets and service animals) about an RDD and how to avoid contamination, decontaminate themselves or seek decontamination. They can be informed about the symptoms and how to seek clinical assessment of potential contamination. HHS via CDC will seek assistance from DOE, DOD, the National Guard Bureau to aide in the detection, evaluation, and monitoring of victims of contamination. Although a National capability does not exist for extensive laboratory capabilities for determining internal radiological contamination, AFFRI, REAC/TS, and the CDC will be asked to support clinical laboratory diagnostics. International colleagues will likely be needed through mutual assistance and/or collegial agreements. The ASPR, CDC, AFFRI and others will provide subject matter advice on diagnosis, mitigation and treatment for internal radiological contamination.

NERDDs require assessments for potential radiological contamination. Persons requiring screening depends on where the radiological material is found and what it is. REDs do not involve a radiological contamination, however, this does not preclude an RED from accidentally releasing radiological material. The radiological contamination issues, assessment, and mitigation will be handled in the same way as an RDD/IED.

Potable Water/Wastewater and Solid Waste Disposal

HHS, in coordination with ESF #3 (Public Works and Engineering) and ESF #10 (Oil and Hazardous Materials Response) may task its components, and request assistance from other ESF #8 organizations as appropriate, to assist in assessing potable water, wastewater, solid waste disposal and other environmental health issues; conducting field investigations, including collection and laboratory analysis of relevant samples; providing water purification and wastewater/solid waste disposal equipment and supplies; and providing technical assistance and consultation on potable water and wastewater/solid waste disposal issues.

(See Food Security and Safety above). Potable water should be handled by the local/regional authorities. Additionally, waste management support will be provided by the EPA under ESF #10 for workers, health care facilities, and clean-up crews, etc.

(See Food Security and Safety above). If a major water source is contaminated, HHS may have to assist the local/regional/state/tribal authorities with potable water until the water supply can be deemed safe. Additionally, waste management will be directed by the EPA for workers, health care facilities, and clean-up crews, etc.

Victim Identification/Mortuary Services

HHS may request DHS and DOD to assist in providing victim identification and mortuary services; establishing temporary morgue facilities; performing victim identification by fingerprint, forensic dental, and/or forensic pathology/ anthropology methods; and processing, preparation, and disposition of remains.

HHS will deploy DMORTs and DPMUs as needed to identify and manage the dead. These HHS assets can be supported by DOD, and will be deployed in support of the jurisdictional Medical Examiner/Coroner. Forensic examination will likely be necessary. CDC has published guidance for handling contaminated remains.

It is unlikely that a NERDD or RED event will generate enough fatalities to require HHS assets for response; however, this will be determined by the scale of the event. HHS will provide guidance for handling contaminated remains. Victim identification and tracking are as for RDD/IED.

Protection of Animal Health

HHS, in coordination with ESF #11, protects the health of livestock and companion animals by ensuring the safety of the manufacture and distribution of foods and drugs given to animals used for human food production, as well as companion animals.

(See Agriculture Safety and Security above.) Pets and service animals within the contamination zone may require veterinary care per local/regional services.

(See Agriculture Safety and Security above.) Pets and service animals, as above.

Activation of Health/Medical Response Teams

Assets internal to HHS are deployed directly as part of the ESF #8 response. Public health and medical personnel and teams provided by ESF #8 organizations are requested by HHS and deployed by the respective organizations to provide appropriate public health and medical assistance.

The response to an RDD/IED will be supported as appropriate by the USPHS RDFs, and NDMS teams such as DMATs and DMORTs. In addition, HHS will request support from the VA MERRTs and National Guard CBRNE/WMD teams. Very specialized teams will be needed for educating victims about radiation injury and for conducting epidemiological studies. The latter will be coordinated by/with the NCI and CDC epidemiologists.

See RDD/IED

Communications

ESF #8 establishes communications necessary to coordinate Federal public health and medical assistance effectively.

The communications infrastructure will be intact. Messages as in Public Health and Medical Information.

Same as RDD.

Information Requests

Requests for information may be received at ESF #8 from various sources, such as the media and the general public, and are referred to ESF #15 for action and response.

Information Cell (ASPR) and ASPA will coordinate with CDC on information requests.

See RDD/IED.

RADIOLOGICAL DISPERSAL DEVICE (RDD) USING EXPLOSIVE DEVICE (IED).

AND

NON-EXPLOSIVE RDD (NERDD) AND RADIOLOGICAL EXPOSURE DEVICE (RED) .

RDD Detonation: 0-24 hours

A. Planning and Coordination

Emergency Declaration:

- An RDD detonation in any U.S. urban setting will likely trigger activation of the Catastrophic Incident Supplement to the National Response Framework by the Secretary of the Department of Homeland Security.
- Immediately following detonation of a Radiological Dispersal Device, the Secretary of HHS will initiate the Federal public health and medical response by:

1. Activating the Secretary's Operation Center to accommodate a full Emergency Management Group (EMG) and Inter-agency Liaison Officers;
2. Appointing EMG staff to fulfill all critical functions and organize EMG authorities and reporting relationships into a NIMS-compliant Incident Command Structure;
3. Esuring that the EMG is adequately staffed and appropriately organized to manage all aspects of the massive, complex, and sustained Federal public health and medical response;
4. Deploying an Incident Response Coordination Team (IRCT) to coordinate the Federal response with the State and local responses;

5. Consider declaring a Public Health Emergency under §319 of the Public Health Service Act (42 U.S.C. §247d); and
6. Requesting and deploy U.S. Public Health Service, DHS, VA, DOT, DoD and other support agency assets to support the operations.

- If the Catastrophic Incident Supplement is activated, HHS as the primary agency for public health and medical response (ESF #8) would have the ability to immediately stage at Federal mobilization centers DMATs, Federal Medical Stations and other public health and medical assets that the Emergency Management Group expects the state to request. The EMG will work with FEMA and the support agencies of ESF #8 to assure a coordinated response.
- The initial medical response will be done hand-in-hand with forensic response by the Department of Justice, in that attribution is a key component of the USG response. Medical response would be done in coordination with the Department of Defense and other ESF #8 support agencies, recognizing that the uncertainty of a terrorist situation will require DOD to fulfill its defense mission as its top priority.

Physical Situation:

- There is not a radiation pulse as seen with an improvised nuclear device (IND). Radiation toxicity can result from contamination, groundshine, material contamination or internal contamination. Dust and debris from the blast will make initial actions difficult and will add to the confusion. The uncertainty of whether the blast is accompanied by other contaminants - radiation, chemical or biological - will likely slow the initial response. Detection of radiation by first responders does require appropriate guidance and precaution from the on-scene officials and reach-back experts. The major radioactive cloud from an RDD detonation dissipates within about 30 minutes resulting in surface contamination of the surrounding environment. Some small particles may be carried downwind, however the significant radiation exposure is only local.

NERDD/RED 0 - 72 hours

Once an attack is suspected, this collective information will be communicated by the CDC through the HAN and EpiX to its surveillance network to assess if there has been more than one incident.

- There is no electromagnetic pulse and the damage to the infrastructure will be due to the explosion. Radiation contamination and the uncertainty of where responders can go and how much time they can spend in an area will slow and also limit the response.
- While training and education are essential for responders, healthcare workers and the general public, it is highly likely that the response to a radiological device detonation will be hindered by fears of radiation.

B. Healthcare, Emergency Response, and Human Services:

- A Radiological Dispersal Device (RDD) detonation will generate physical trauma, burn, radiation exposure and possible contamination from spread of radioactive material, and combined injuries ranging from fatal/severe to mild. Almost all of the initial injury will be from the explosion but some individuals will have superficial radiation contamination and others may have radioactive shrapnel or inhalation that requires decontamination, surgical removal and/or medical decorporation/blocking agent treatment. In addition, people may be injured by secondary sources such as car accidents and building collapse.
- The goal of federal public health and medical support will be to integrate with the state and local response to swiftly and effectively augment their capabilities. Accomplishment of this will require close communications with state and local jurisdictions as well as with their field assets. In the initial hours, the response will be somewhat chaotic and communications may be unreliable. First responders, fire fighters, police and other groups in the local / regional response have expertly trained individuals who can provide radiation detection services, and identify perimeters for the hot, warm, cold zones. Local health and medical physicists will provide subject matter expertise and will be advised to consult the Radiation Event Medical Management system (or other sources such as EPA, CDC, FEMA, FRMAC) for recommendations on radiation dose and safety. The information from the measured dose will guide the amount of time responders will be able to stay in a certain area. Federal assessment teams will be sent to assist state and local response operations as well as to enhance situational awareness for the U.S. government (USG).
- Except for an extraordinary event or multiple simultaneous events, the local/regional resources will likely be adequate to address the immediate medical needs. However, the surge in injured may require unusual efforts to obtain the maximal benefit from the available resources. Triage will be performed by local-regional providers based on pre-existing local triage guidance. There will be fatalities and “expectant” individuals who have a low likelihood of survival. This means that hospital, ICU and specialty care beds will be used for the injured patients whose odds of survival are best. It must be understood that prognosticating under these circumstances is imprecise at best, and only general protocols to fairly and justifiably distribute specialty care will be possible. To an extent much less than for an IND, triage will require difficult decisions regarding who will receive aggressive medical management and who will receive comfort measures only. Patients with minor injuries will receive care after more seriously affected patients are treated. If needed, patients will be cared for

in alternative facilities such as mobile hospitals or lower acuity medical shelters, and some may need transportation to distant hospitals to either vacate acute care beds or for specialty care.

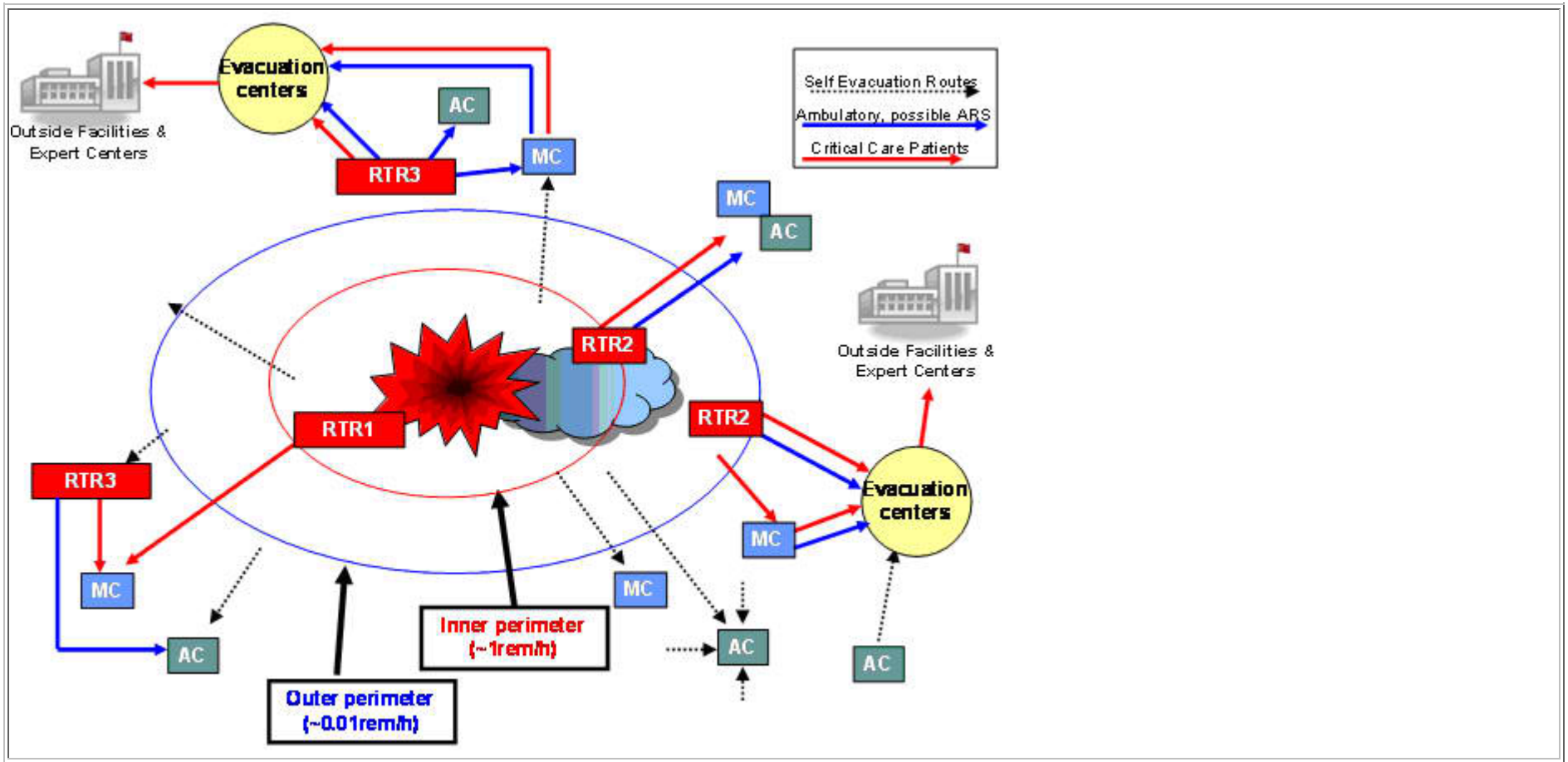
- Response teams will be activated including DMATs, DMORT and NDMS hospitals. The Radiation Injury Treatment Network (RITN) will be alerted once radiation is detected; the ASPR will activate the SNS or provide other sources of countermeasures should they be needed. Timing would be critical for an event requiring DTPA (Americium, Plutonium, Curium), Prussian Blue (Cesium) or Potassium Iodide (radioactive iodine).

NERDD/RED 0 - 72 hours

Once the type of attack is recognized, efforts will be made to identify potential exposed individuals. Many of those exposed to inhalation or ingestion may have little detectable radiation and those subject to an RED will have none. They may have alterations in blood count, but that is not very likely. It may be possible for health physicists to reconstruct the potential exposure and contamination dose. Medical management will depend on the symptoms and in particular, physical signs and laboratory data including skin burns, altered blood cell counts and as needed, appropriate analysis of urine, stool, blood or swabs from skin, nose, hair and clothing for RDD.

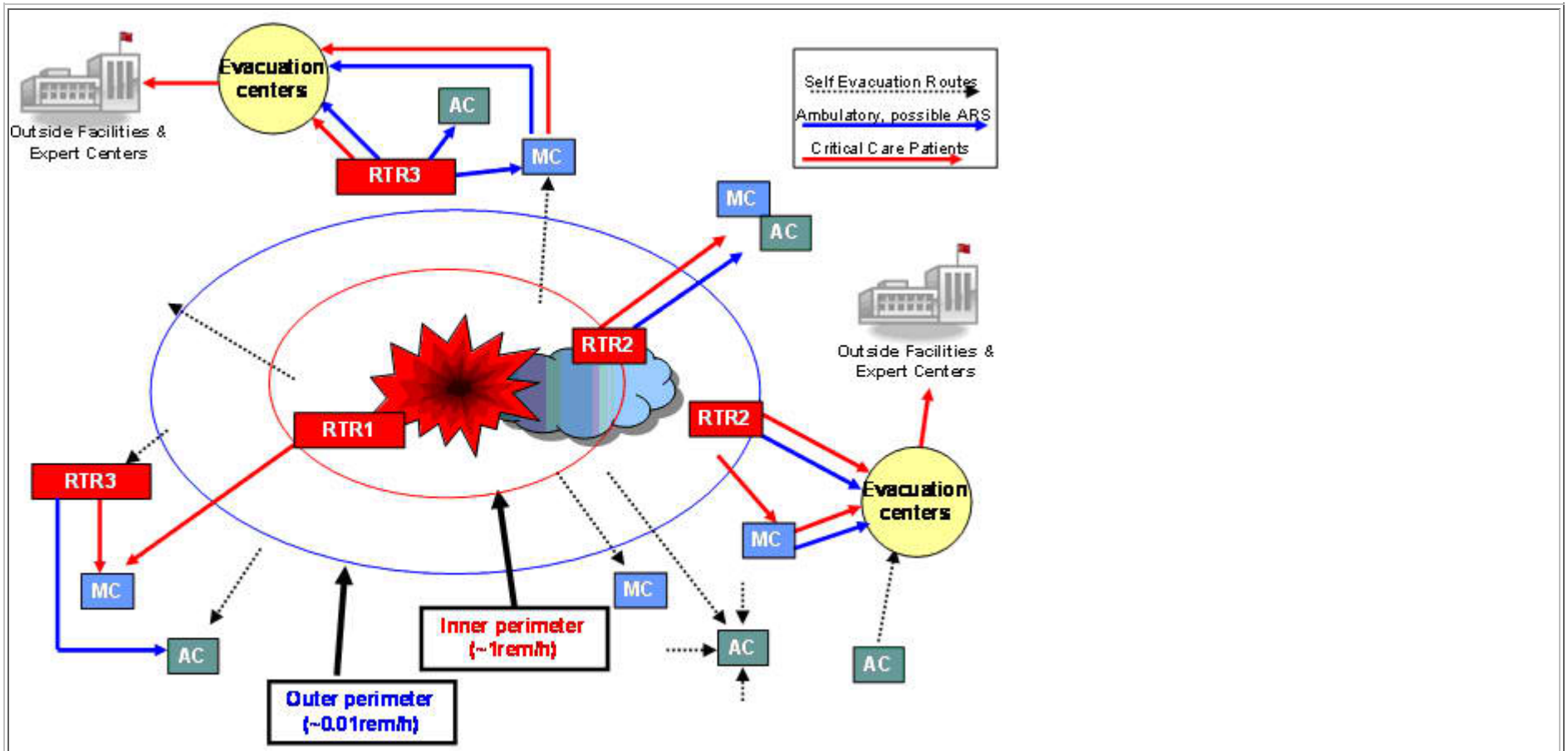
Currently there is limited capacity to conduct cytogenetic analysis (CDC) and biodosimetry (AFRRI, REAC/TS, and international partners) to assist with determining whether individuals have actually been exposed to radiation. Management will likely involve symptomatic care, burn care and, although unlikely, treatment of ARS. Decorporation will be needed if there is sufficiently high level of internal contamination. The ASPR EMG will coordinate with CDC the deployment of appropriate countermeasures.

- The tiered triage, treatment and transport approach (RTR 1, 2 and 3, MC and AC sites are similar to that of an IND) is based on determining where medical interventions will occur. The radiation dose will change rapidly over time as the initial explosion settles, radiation dissipates and any plume is dissipated by air currents. For RDD, most of the major radioactive material will settle within 15 – 30 min. Guidance as to sheltering in place will relate to exposure from the fallout on the ground and on surfaces and not to airborne radiation which has already settled by the time the situation is assessed and announcements can be made.



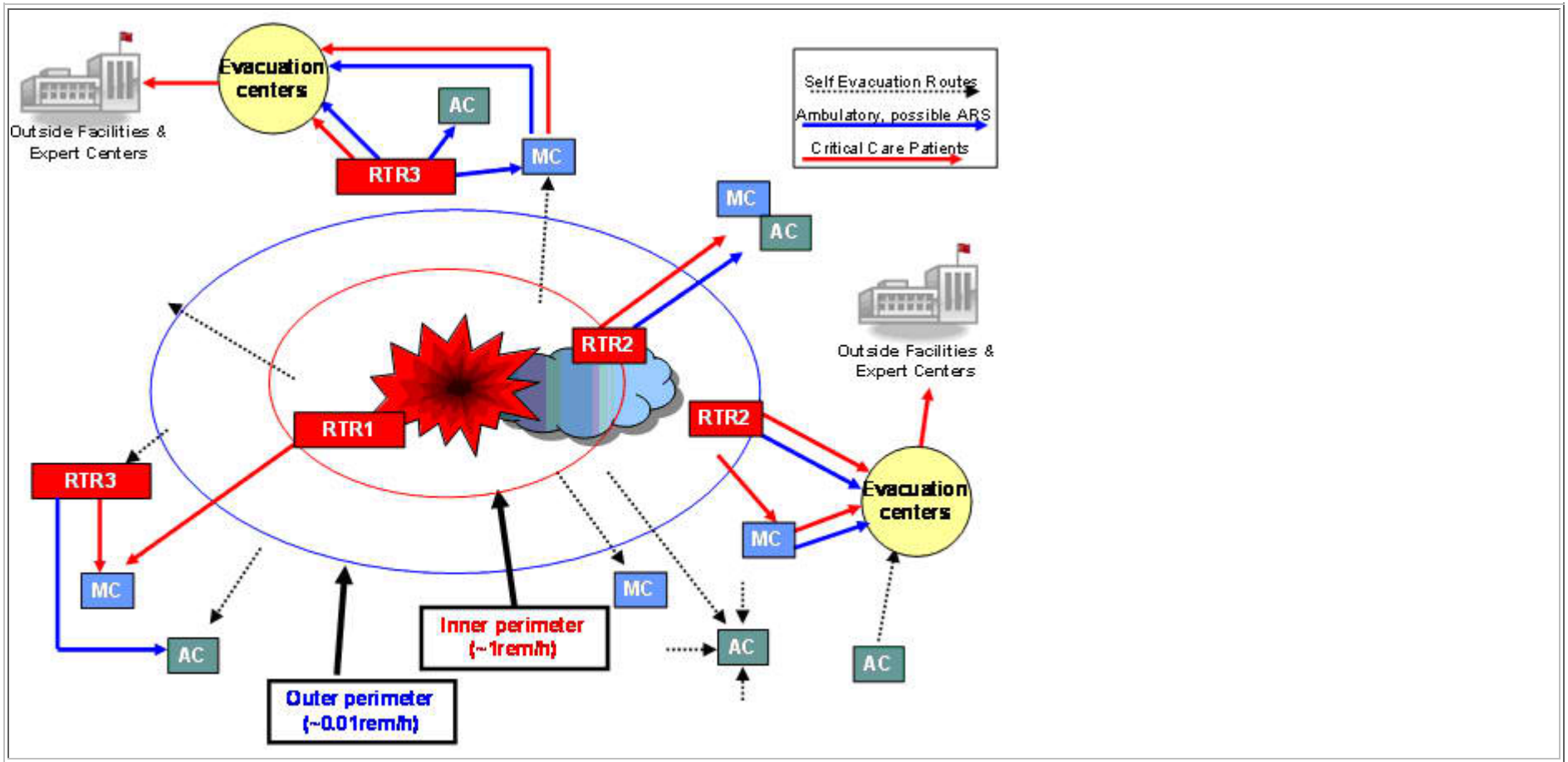
RTR 1-3:

RTR 1 locations will be determined by where the victims happen to be. The initial dose estimates and time-permitted for responders will be determined with guidance from health physicists based on blast size and knowledge of the radionuclide if any. Rapidly, the dose and time-

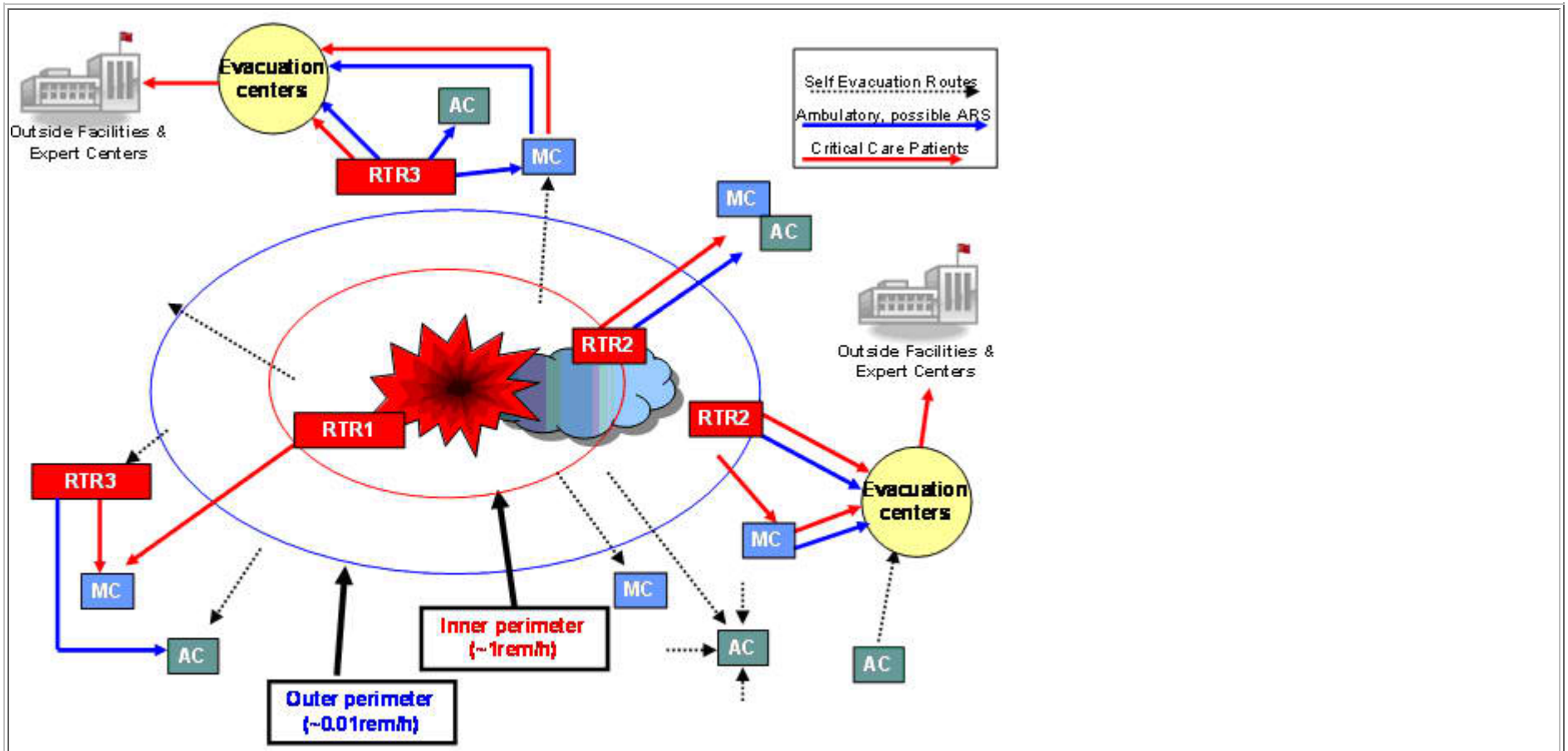


permitted will be based on actual data obtained from the first responders.

RTR 2 and RTR 3: Based on the size of the damage and dosimetry, additional RTR sites will be determined. In the absence of dose information, an initial radius of approximately 500 meters will be recommended but this will be altered as soon as information is known. In that

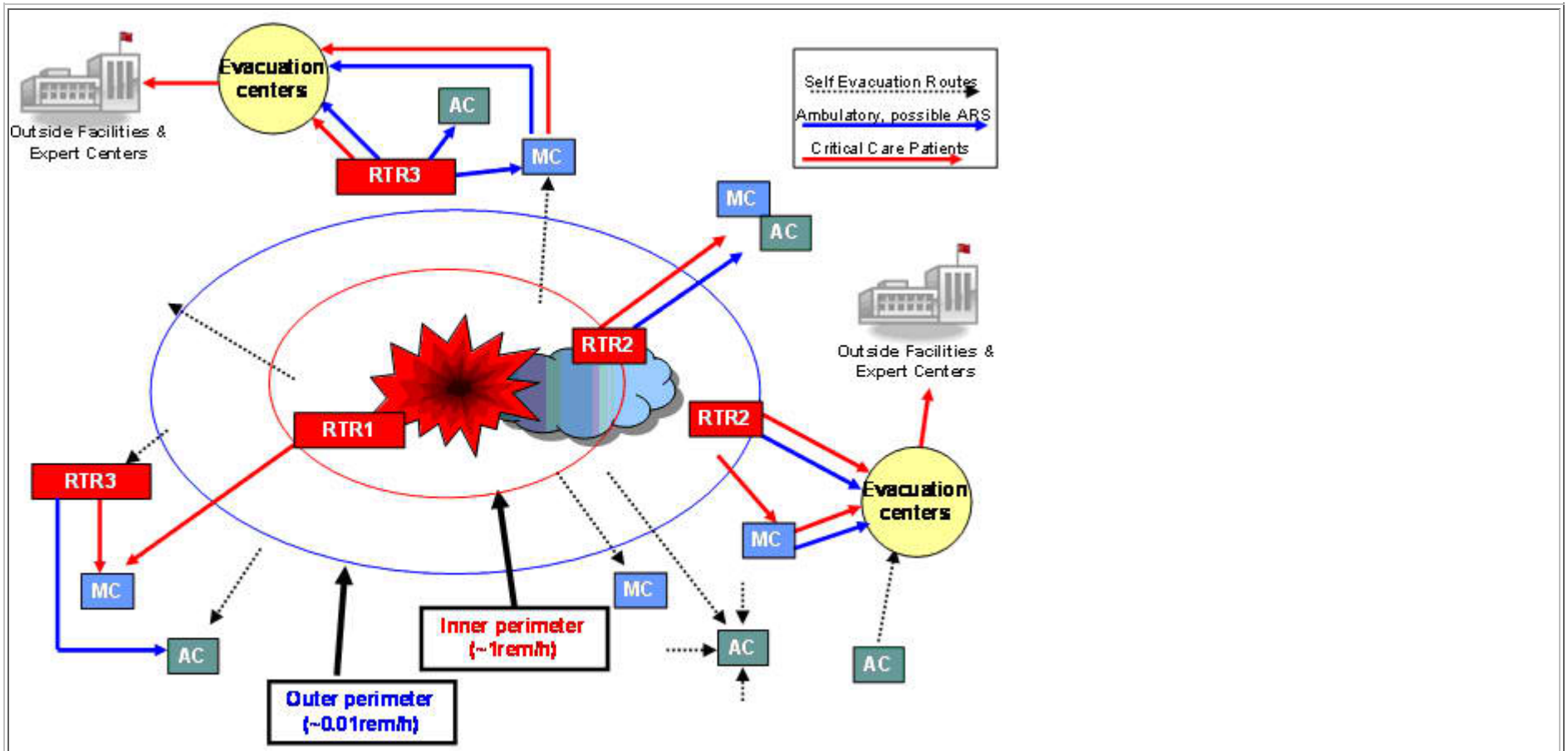


the plume settles rapidly, the radiation is due to the footprint left by the settled plume.
The area is cordoned so that those leaving it can be held at these RTR2 and 3 collection points for screening for radioactive contamination. A secondary perimeter farther out will be established to allow individuals leaving the zone to be screened for contamination. Individuals and groups within the fallout/footprint zone are given orders to evacuate once the major dust settles and to cover their nose and mouth with multiple

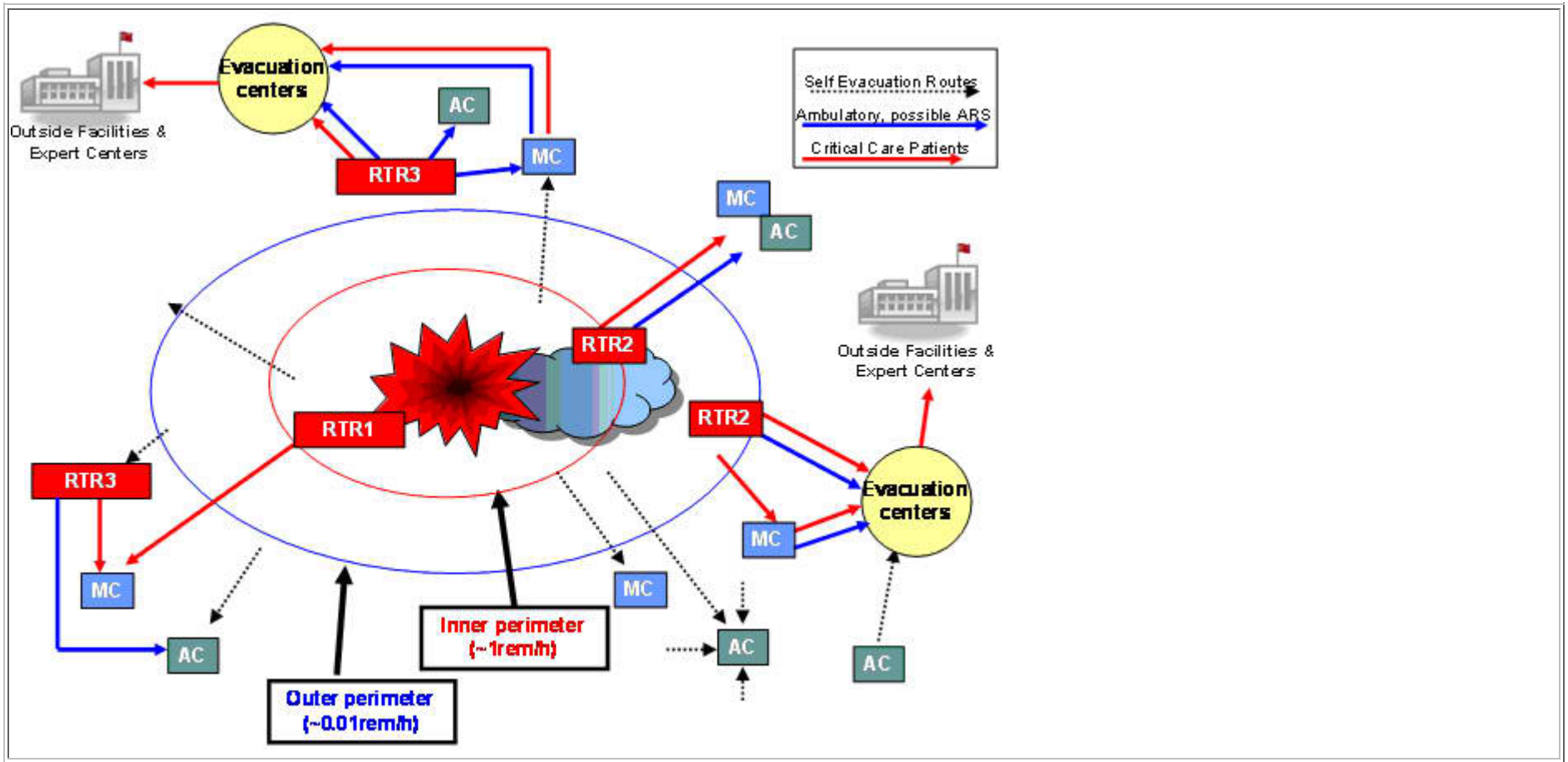


layers of tissue, toilet paper or material. We can anticipate that some will panic and some individuals will evacuate through the fall-out and footprint zones thus increasing their radiation exposure.

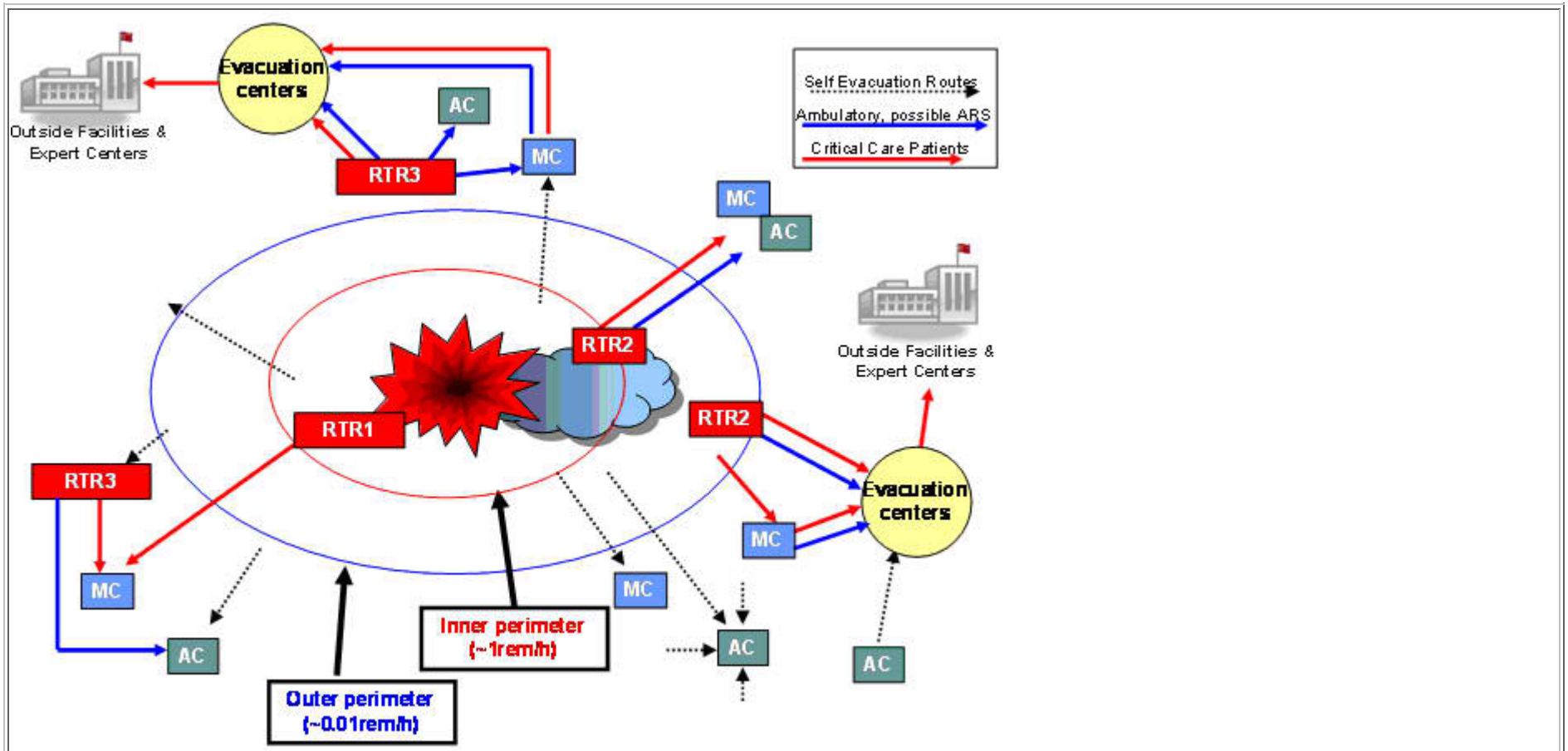
MC (Medical Care) Sites:



Ambulances and self-evacuation would deliver and gather people at local hospitals. Some will have severe combined injury and may be triaged to expectant treatment and palliative care.
RDF team (s) are placed on alert or activated in the event medical care is needed for evacuees. DMAT is mobilized to be set up near a major hospital for overflow, if needed.



AC (Assembly Center) - Multiple Sites:
These have will be set up next to hospitals for those not needing medical care and in facilities including convention centers, professional sports stadiums, school gymnasiums and churches. None of these people were in a zone with radiation and after initial calming down of their fears and



concerns, most will return to their homes. The people who live in or near the zone that requires additional radiation dosimetry data to assess if it is safe to return will need food and shelter until the guidance is available. The American Red Cross will assist the local/state and regional authorities to provide food and shelter. An FMS may be used to support the medical needs of evacuees who have exacerbations of their chronic conditions.

C. Surveillance, Investigation, and Protective Health Measures:

- The EMG in cooperation with the IRCT will closely monitor information regarding the size of the event, extent of damage, presence of radiation and possibly identification of the radionuclide.
- Medical physicists with access to a gamma spectrophotometer (which is a common laboratory instrument in any facility performing radiological assays) may be able to analyze the radionuclide involved. If not, samples will be taken to environmental assay laboratories.

NERDD/RED 0 - 72 hours

Covert radiological attacks include exposure devices and non-explosive RDDs may be difficult to detect initially. They may be detected by routine environmental surveillance and area monitors or they may be virtually undetected until injured victims present with illness. Astute clinicians may recognize presentation patterns that result from exposure to radiological materials. National surveillance reports may detect a pattern of symptoms. Due to the covert nature of these types of attacks, the concept of operations for response to an incident of this nature is different from the tiered triage response to an explosive or apparent point source device. The number of involved individuals can vary from a 100 or so from an RED, to 1000's for an aerosolized RDD in an enclosed space, to 10,000's in a food or water supply contamination. The likelihood of ARS is low and the major risk will be the concern for long-term radiation-related cancer and environmental contamination.

- **Decontamination** is a responsibility of the state and local responders with advice from ESF #8. Those severely injured should be transported even without decontamination, although it may be possible to remove superficial clothing and wrap victims in double sheets/blankets to try to avoid contaminating the ambulance or other conveyance vehicle.
- Those with limited contamination may undergo decontamination at collection points or exit points from control zones. Others who have left the area or are instructed to do so may undergo self-decontamination at home. Exposed personal items should not be taken inside the house, if at all possible. For self-decontamination people are instructed to go home, remove clothing outside of the house, place it in plastic bags, then shower and wash hair (no conditioner). Bags of contaminated items will be collected later.
- The CDC radionuclide assay laboratory will be activated in preparation for both environmental and clinical samples. The latter may be needed to identify internally contaminated individuals and to assist in guiding their treatment with decorporating agents. Depending on the number of casualties the laboratory capacity may be overwhelmed and precedence will be give to analyzing clinical samples. Transportation of equipment to the site may be necessary, as requested by CDC.

- Health physicists can help monitor dose to responding medical personnel. The plan is to limit personnel to 1 rem/shift and maximum 5 rem. Passive personal dosimeters (e.g., film, TLD, OSL badges, etc) are distributed widely to hospital personnel working with the contaminated victims and electronic real-time monitors are used for those in contact with the victims, until a patient and an area can be declared as “clear”.
- Health physicists will screen additional ambulatory patients. Depending on the number and type of casualties, some may require blood and urine sampling to calculate radiation contamination. Samples will be collected, per CDC instructions. The REMM website may be used to guide drug administration and FDA, CDC and other HHS experts are available for consultation.
- Deciding who needs screening will be done by medical personnel in conjunction with health physicists. Individuals who were likely within a radiation zone, those who were contaminated as assessed by survey meters and others whom physicians feel need screening will undergo the additional laboratory tests.
- Although it is still an early time point, it is essential to track both exposed victims and other concerned citizens. The opportunity to gather information should not be lost although detailed testing can be delayed as medically indicated. Victims who had significant exposure to fallout or those with internal contamination may be considered for biodosimetry risk assessment using radiation-induced chromosome changes. Epidemiologists and health physicists would help select those victims at risk, likely those who had a dose of 75-100 rem (possibly 50 rem or so for younger people). In that the chromosome changes are stable, there is no urgency in doing this test, which could be done months or years later.
- Cytogenetic analysis might be necessary for some individuals early on if there is concern that they had a dose above 2 Gy, although this would be very few people. The planned Radiation- Laboratory Response Network could meet this need once it is developed. (AFRRI, REAC/TS and others).

D. Pharmaceuticals, Medical Supplies and Equipment:

- Information from the local/state/regional area as to number and type of casualties will be received at the SOC. Determination will be made as to the extent of shortfalls and the need for special treatments such as burns and radiation management.
- NDMS, VA, RITN and Burn Centers will be notified and potentially activated, as necessary.
- When the radionuclide is identified, treatment will be initiated for those who might be at risk as determined by medical history and laboratory analysis. For those at risk for ARS, empiric therapy may be initiated.
- Appropriate medical countermeasures will be initiated. This will likely require coordination of local/state/regional personnel for deployment of locally owned and SNS stockpiles. Most of the decorporating/blocking agents are FDA approved. For those that are not, an Emergency Use Authorization will be provided from FDA.

E. Patient Evacuation:

- Experience with prior disasters suggests that victims will spontaneously gravitate toward familiar institutions for assistance, and these will become casualty collection points. This is especially of concern as the general populous in an affected metropolitan area becomes aware of radiological contamination without an understanding of the scope of dispersal. Efforts will be made to staff these ad hoc casualty collection points to support triage, initial treatment, and, when appropriate, contamination and palliative care at these locations. These would be RTR3 & AC sites and housed in buildings of opportunity, especially along near evacuation routes. While the number of casualties requiring medical intervention may be only a few hundred or thousand, the surge of concerned citizens and displaced persons will likely require federal medical response personnel to be deployed.

F. Communications and Outreach

- Education of the risk from radiation is important and this must be done immediately to minimize fear and panic.

While it is a carcinogen, radiation is relatively weak and radiation-induced cancers may not appear for decades. Thus, many individuals may not be particularly interested in undergoing this cytogenetic analysis. They might simply opt for good preventative care such as smoking avoidance, exercise and use of routine screening tests such as mammography and colonoscopy. An event with radioactive iodine would be different and require appropriate monitoring for children and young adults.

- Preplanning, and training to optimize coordination among local, regional and Federal response assets is essential. It is expected that there will be significant numbers of unaffiliated volunteers who will self deploy to assist. Local and state authorities will credential healthcare professionals.
- Recovery of human remains and mortuary care will be initiated as soon as it is safe to do so, but this will be a secondary priority if the same resources are needed for rescue and acute care of victims. Despite the conditions, recovery and mortuary operations will be

conducted with respect and dignity. Messages which clearly explain what can be expected, how treatment can be obtained and what the public can do to support the response will be jointly scripted with the state and local authorities.

RDD detonation: 24-72 hours

A. Planning and coordination:

- Review damage assessments with FEMA in order to:
  - Coordinate rapid needs assessment
  - Discuss need for activating ESF #14 (Long-term community recovery and mitigation)
- Adjust HHS-EMG staffing level
  - Expand Operations, Planning, Logistics, Admin & Finance and SMEs as needed
  - Request Liaison Officers from ESF#8 partners
- Update situational awareness of hospital and healthcare infrastructure
- Make adjustments to pre-scripted Sub-Tasks
- Develop common operating picture for long-term recovery and establish a transition to recovery plan

B. Healthcare, Emergency Response, and Human Services

Extension of medical care at MC sites:

- At this point almost all of the injured will have been brought for medical care. The need for surge capacity and special medical care will be determined. As needed, victims can be brought to expert care within NDMS, VA, RITN or other regional medical centers. Less acute patients may require transport from the local hospitals to distant sites.
- The radionuclide has been identified and appropriate medical countermeasures initiated.
- CDC bioassay laboratory will be operating to perform diagnostic tests. This will be necessary to screen people for internal contamination, who have been deemed at risk by medical and health physics personnel.

C. Surveillance, Investigation, and Protective Health Measures

Long-term monitoring for risk of cancer and victim tracking:

- Large numbers of people will likely seek care due to concern about having been exposed to radiation. Federal experts including CDC and epidemiologists from NCI and other agencies, can assist states and localities in long-term tracking of both exposed victims and other concerned citizens.

The opportunity to gather information should not be lost although detailed testing can be delayed as medically indicated. Victims who had significant exposure to fallout or those with internal contamination may be considered for biodosimetry risk assessment using radiation-induced chromosome changes. Epidemiologists and health physicists would help select those victims at risk and most likely those who had a dose of 75-100 rem (possibly 50 rem or so for younger people).In that the chromosome changes are stable, there is no urgency to run this test, which could be done months or years later.

- Currently there is limited capacity to conduct cytogenetic analysis to assist with determining whether individuals have actually been exposed to radiation. The proposed Radiation Laboratory Response Network would greatly enhance our capability to separate those who have actually been exposed from those who are concerned that they may have been exposed.

D. Pharmaceuticals, Medical Supplies and Equipment:

- Potential shortages of medical supplies will be identified and restocking may be needed from regional hospitals via local/regional agreement, the SNS or vendor managed inventory.

E. Patient Evacuation:

- Transfer of less acutely ill patients to accommodate local surge capacity may be necessary. Surge capacity for decorporation may be necessary to RITN centers.

F. Communications and Outreach:

- Education for the general population and medical practitioners of the risk from radiation is important and this must be done immediately to minimize the fear and panic. While it is a carcinogen, radiation is a relatively weak one and radiation-induced cancers may not appear for decades.

Many individuals may not be particularly interested in undergoing this cytogenetic analysis or even long-term follow up. They might simply opt for good preventative care such as smoking avoidance, exercise and use of routine screening tests such as mammography and colonoscopy. An event with radioactive iodine would be different and require appropriate monitoring for children and young adults.

Preparation for Long-Term Psychological Stress:

- By distinguishing those with significant contamination/exposure from those without them, and by providing information regarding radiation-induced cancers, the number of individuals who have a sustained long-term psychological stress should be reduced considerably. Nevertheless, as seen with other radiological disasters, this long term fear will need to be monitored and addressed with education, counseling and other medical interventions for stress-related illness as required.
- Messaging is critical. It must be correct, credible, prompt and understandable.
  Existing psychological counseling services may be overwhelmed requiring additional experts from PHS and/or other HHS components

RDD Detonation: Beyond 72 hours

A. Planning and Coordination

Demobilization of Federal medical response:

- The likely modest size of an RDD event will mean that there is a limited need for federal medical resources. It is likely that most displaced persons will be accommodated within a few weeks and most victims will be out of the hospital.

NERDD/RDD Should multiple sites be involved, there may be the need to deploy SMEs for a sustained period of time to conduct the activities listed above

B. Healthcare, Emergency Response, and Human Services:

- Ongoing support may be needed

C. Surveillance, Investigation, and Protective Health Measures:

- The experts on epidemiology will likely have a sustained role. Other agencies involved in site remediation will be guided by HHS experts including CDC and NIH.

NERDD/RDD

- The time line may be uncertain so that these activities will be initiated early on. However, they will be sustained.
- Screening and identification of victims, using Rad-LRN.
- Risk assessment, using cytogenetic biodosimetry, as available.
- Education regarding the risk from radiation. This may require long-term education, and HHS experts participating in local discussions and presentations.
- Epidemiological assessment, using experts from HHS (CDC, NCI).
- Working with other agencies regarding safety of the food and water supply.
- Advising local/regional authorities on restoration and reoccupation of radiation zones.

D. Pharmaceuticals, Medical Supplies and Equipment:

- Those requiring a full course of decorporation will be under treatment. Some ongoing support from CDC radio-bioassay lab may be needed.

E. Patient Evacuation

- Continue as necessary

F. Communications and Outreach:

SMEs may be involved long-term with counseling and public education. Consultation may be needed from HHS along with other agencies (e.g., EPA, CDC, FEMA) regarding restoration and reoccupation of disaster site.

Action Steps/Issues

Phase 0: Credible Intelligence	
Trigger Point	**Credible Intelligence of a Plan to detonate a Radiological Dispersal Device (RDD) or a Radiological Explosive Device (RED) in a U.S. City**
HHS Strategy	**Begin preparation for public health and human service response in case of an RDD or RED** **NOTE: Appropriate security classification will be maintained for all discussions related to Phase 0**

Phase 0 Actions/Issues	**Lead/Support Agency**
A. PLANNING AND COORDINATION	
1. HHS transition from “normal” to “Coordinated Departmental Emergency Response Operations”	

Phase 0 Actions/Issues	Lead/Support Agency
2. Begin structured planning process. Brief the Secretary/Deputy Secretary • Situation update. • Required tasks • Available assets • Determine constraints • Identify critical facts and assumptions • Determine critical information requirements	
3. Activate the EMG • Initiate notification roster • Determine additional EMG staffing requirements and OPDIV EOC activation requirements • Prepare daily or more frequent situation reports for the Secretary on preparedness efforts • Designate Incident Manager (IM) • Begins response planning in coordination with relevant support agencies • Begin development of possible ESF #8 mission assignments in coordination with ESF #8 partners, State/local officials and DHS • Establish and maintain contact with OPDIVS and ESF#8 Federal partners • Establish and maintain contact with appropriate RECs • Develop initial Incident Action Plan (IAP)	
4. Coordinate/Conduct meeting to determine possible missions, deployments • Consider the requirement to establish PODs • Epidemiology Support • Medical Treatment Support	

Phase 0 Actions/Issues	Lead/Support Agency
• Subject Matter Expert Support	
5. Begin coordination with the Interagency, including DHS and DOS, and the White House • Prepare/Detail required liaison officers to DHS and other agencies as requested • Alert ESF #8 partners • Begin coordination with appropriate DHS/FEMA contacts (RRCC, RECs, etc) • Alert/Deploy the Incident Response Coordination Team	SEC HHS/ASPR/ESF #8 Supporting Agencies ASPR/IM
6. Formalize and distribute ESF-8 response structure, decisional authorities, and trigger points for public health & medical interventions.	ASPR/ESF #8 Supporting Agencies
7. Review risk status (i.e., health screening and countermeasure status) of all federal and contractor employees who could potentially deploy in support of ESF-8 response activities.	ASPR/ESF #8 Supporting Agencies
8. Establish contact with key public health, healthcare, and community partners (i.e., State Health Department, State OEM, State Hospital Association, etc.)	ASPR/RECs
9. Establish and publish schedule for recurring activities (Conference Calls, VTCs, etc.)	ASPR/IM
B. HEALTHCARE, EMERGENCY RESPONSE AND HUMAN SERVICES	
10. Request/Review appropriate State, Tribal and local emergency management plans, focusing on: • Point of Dispensing (POD) operations\ • City Readiness Initiative • Patient regulating and movement processes • High acuity care expansion capability	SEC HHS/ASPR/CDC/ESF #8 Supporting Agencies
11. Consider increasing the capacity of medical and emergency response systems to meet expected needs by	ASPR

Phase 0 Actions/Issues	Lead/Support Agency
identifying/alerting/pre-staging/deploying/distributing: • Federal healthcare assets, including NDMS, FMS and ESF #8 partner assets • Epidemiological support • Veterinary surveillance • Laboratory activities • Critical care capability • POD capabilities (augmentation/establishment) • Commissioned Officer Corps Teams • Pharmacy activities • NDMS Teams • Medical/Surgical/Burn Nurse teams • SNS counter measures and other appropriate supplies and material • Additional reagents and consumables for surge testing at appropriate LRN laboratories	OPDIVs/Agencies/ ESF-8 Supporting Agencies
C. SURVEILLANCE, INVESTIGATION, AND PROTECTIVE HEALTH MEASURES	
12. Provide updated information to medical providers and healthcare organizations seeking treatment and management guidance and algorithms for RDD/RED exposure.	SEC HHS/ASPR/CDC/IGA
13. Coordinate lab surge capabilities with CDC and State/Tribal/local authorities.	SEC HHS/ASPR/CDC
14. Begin collecting and collating applicable information for the area. • GIS • Meteorological\ • Transportation • Intelligence • Law Enforcement	ASPR/IGA/ESF #8 Supporting Agencies

Phase 0 Actions/Issues	Lead/Support Agency
D. PHARMACEUTICALS, MEDICAL SUPPLIES AND EQUIPMENT:	
15. Decisions to pre stage or deploy medical countermeasures need to be made based on the credibility of the intelligence and the threat	
E. PATIENT EVACUATION	
16. Decisions on hospitalized patient evacuation need to be made based on the credibility of the intelligence and the threat	
F. COMMUNICATIONS AND OUTREACH	
17. Review Communications Plan. • Mitigation • Preparedness • Response • Recovery	ASPA/ASPR
18. Review Media Campaign Plan. • Contacts • Information requirements • Timelines	ASPA/ASPR
19. Identify SMEs on medical and public health aspects of RDD/RED exposure	ASPA/ASPR/CDC
20. Identify HHS spokesperson(s).	ASPA/ASPR

Phase 0 Actions/Issues	Lead/Support Agency
21. Identify public affairs liaison officer assignments and responsibilities.	ASPA/ASPR

Phase I: Early (0-12 Hours Post Detonation RDD)	
Trigger Point	**Detonation of an Improvised Explosive Device, Radiological Material Realized Actions Steps start at this point on the absence of credible intelligence)**
ESF #8 Strategy	**Closely monitor events and Begin review of advance preparations required to facilitate an effective and timely response**

Phase 1 Actions/Issues	Lead/Support Agency
A. PLANNING AND COORDINATION	
1. Activate Emergency Support Functions (ESF)s in support of the even	FEMA/DHS
2. Consider declaring a public health emergency	HHS Secretary
3. Activate all components of the EMG to include selected liaisons and specialties • Expand Ops, Planning, Log, and SME cells as required • Request LNO from ESF #8 partners as required (e.g. DOT, DoD, VA, DHS/FEMA, ARC, DOE, EPA, OSHA, FEMA Recovery LNO) • Request LNO from operating/staff divisions • Working with State & Local Authorities and DHS determine the event as an RDD/RED and the type of radiological agent to determine the appropriate countermeasures	ASPR
4. Provide representative to ERT-A and Deploy IRCT –A, IRCT (including SHO) a. Operations Section	EMG EMG-OPS

Phase 1 Actions/Issues	Lead/Support Agency
o Initiate regular HHS-EMG Coordination Call o Alert rostered teams (RDF, APHT, MHT, NDMS IRCT, HHS Human Services technical assistance team and subject matter expert assessment team) b. Planning Section o Prepare Incident Action Plan and assure plans are coordinated with ESF #8 support agencies, IRTC, OpDivs/Staff Divs and DHS/FEMA. o Analyze vulnerability of critical health care infrastructure in the expected impact zone. c. Logistics Section o Coordinate medical support within HHS o Coordinate non-medical support with FEMA d. Administration and Finance o Ensure that funds are available to support operations o Process Mission Assignments and Sub Tasks o Track mission assignments o Institute tracking of deployed personnel	EMG/OFRD EMG/HSC liaison EMG Plans/OPEO CIKR and FEMA recovery liaison EMG LOG/DHS/FEMA EMG LOG/DoD EMG A&F
5. Upon receipt of the NOC/NRCC Activation Order a. Update situational awareness and ensure visibility of the common operating picture is maintained. b. Staff the ESF #8 desks at the NRCC, IMPT, NOC, as requested c. Ensure that all essential functions can be performed and all related services can be provided. d. Initiate incident-specific information and data collection, analysis, and assessment e. Perform effects and consequences modeling and simulation analysis on the geography, demographics, and population, including the at-risk population and critical infrastructures. Coordinate with IMAAC.	EMG ALL, IMAAC

Phase 1 Actions/Issues	Lead/Support Agency
f. Confirm essential communication and coordination links with Other Federal Agencies (OFA) to ensure optimal information sharing, and a common understanding of the expected mission and objectives. g. Establish initial Battle Rhythm video teleconferences and other conference calls within ESF #8 emergency management community concerning the situation, mission and objectives h. Confirm lines of communication and coordination with non-collocated command and control entities. i. Continue to review and validate internal and interagency senior officials' "playbooks" and "checklists" including: o Essential Elements of Information (EEI) o Information collection requirements and capabilities; o Information analysis and intelligence procedures; and o Reporting requirements j. Prepare to execute Pre-Scripted Statements of Work (PSOWs) and Sub Tasks to ESF#8 partner departments and agencies and HHS OpDivs/StaffDivs and ensure existing interagency and contractual vehicles are available for rapid implementation and execution k. Disseminate IMACC products as appropriate	
6. Compare pre-impact with initial post-impact of the likely consequences to the public health, medical and human services critical infrastructures	EMG
7. Provide all ESF#8 partners with specific reporting/requesting guidance on dosimetry and personal protective equipment for entry into the area of operations.	EMG, SME Cell
8. Deploy supplies and equipment packages (logistics support) for all ESF #8 teams / personnel deployed in support of ESF #8 missions	OPEO/LOG CDC/DSNS
9. Coordinate with the potentially deployed IRCTs to stage FMS and advance personnel to set-up and install FMS Installation Team	OPEO/IRCT/CDC/JFO/ARC CDC/DSNS/OFRD

Phase 1 Actions/Issues	Lead/Support Agency
10. Establish and maintain contact with key public health, healthcare, and community partners, including partners serving the at-risk population	ASPR/CDC/CMS/OCR/ IGA/SME
11. Develop, release and communicate guidance to public health officials and community partners, EMS for response, including counter-measures, concepts of operations, protective action guidelines, triage information, food safety, shelter in place, water safety, etc.	ASPA/CDC
12. Upon receipt of Mission Assignment from FEMA execute the appropriate sub tasks as required.	DHS/FEMA/OPEO-EMG/ ESF #8 partners
13. Deploy other logistics assets for ESF #8 teams/personnel to staging locations	EMG-LOG
14. Assess and coordinate Security Requirements for ESF #8 assets	EMG-OPS
B. HEALTHCARE, EMERGENCY RESPONSE AND HUMAN SERVICES	
15. Activate and deploy NDMS teams and patient movement components as appropriate.	OPEO
16. Request NDMS , HaVBED and BARTs bed counts	OPEO
17. Activate the American Association of Blood Banks Interagency Task Force on Domestic Disasters and Acts of Terrorism (AABB) to assess the current blood supply levels throughout the country	HHS/OPHS
18. Coordinate with AABB Task Force to identify supply levels at the supporting medical facilities for the incident. Activate supply distribution plans for affected region(s).	HHS/OPHS
19. Obtain approval for AABB Task Force coordinated public information assistance announcement re: the adequacy and safety of the nation's blood supply.	HHS/OPHS
20. Request assessment of healthcare infrastructure from the IRCT(s).	HHS/ASPR CIKR
21. Identify sites of opportunity for RTR 1-3,and MC and AC sites (as needed)	IRCT
22. Obtain evacuation and patient transportation routes	.
23. Obtain decontamination sites for support at extraction points and/or at Triage locations.	.
24. Obtain receiving, distribution and transportation Hubs (logistics Stand-up)	.

Phase 1 Actions/Issues	Lead/Support Agency
25. Stage/Deploy ESF #8 teams and equipment caches as required in support of MC sites.	NDMS/OPEO-LOG & NDMS
26. Coordinate with FEMA requirements for medical personnel augmentation at general/mass care shelters	HHS Human Services/ARC/ESF #6
27. Activate the Ambulance Contract for medical transportation (ground, air and para-transit ambulances)	EMG/FEMA
28. Activate Radiation Injury Treatment Network to potentially receive patients with Acute Radiation Syndrome.	OPEO
29. Activate the Rapid Response Victim Registry	CDC
30. Request DOJ to establish missing persons HOTLINE or integrate with the National Center for Missing and Exploited Children for tracking of patients, persons looking for family members	ACF
C. SURVEILLANCE, INVESTIGATION, AND PROTECTIVE HEALTH MEASURES	
31. Deploy the Interagency Advisory Team (A Team)	EMG - SME
32. Provide recommendations regarding decontamination and medical management	EMG - SME
D. PHARMACEUTICALS, MEDICAL SUPPLIES AND EQUIPMENT:	
33. If SNS assets required, deploy CDC TARU team and/or FMS teams as necessary	EMG/CDC/DSNS/OFRD
34. Deploy SNS radiation countermeasures as indicated by type of radionuclide and types of injury	CDC/DSNS
35. Alert VA to be prepared to provide health and medical logistics/supply support via National Acquisition Center (NAC).	EMG- LOG/VA
36. Submit EUA /IND for countermeasures that are not FDA approved. (EUA Playbook)	EMG FDA
E. PATIENT EVACUATION	
37. Convene Medical Interagency Coordinating Group (MIACG) to evaluate and make recommendations regarding the medical need and patient evacuation, including evacuation of members of the at-risk population.	OPEO/NDMS
F. COMMUNICATION AND OUTREACH	

Phase 1 Actions/Issues	Lead/Support Agency
38. Participate in the National Incident Communications Conference Line (NICCL) composed of Federal public affairs officers as well as local and state public affairs officers. The goal of the NICCL is to develop and implement a coordinated communications plan that ensures the provision of timely and accurate information across all levels of government ("one voice").	.
39. Provide information on medical and public health response activities with as much granularity as possible	SEC HHS, ASPR, ASPA, CDC, DHS, SHO, OCR
40. Provide anticipatory guidance on how the public health and medical response (including mass fatality management) will unfold over time	
41. Explain the rationale for difficult decisions that must be made due to overwhelming need in the context of resource scarcity (e.g., first priority is to save as many lives as possible)	
42. Provide behavioral health expertise to help craft messages	
43. Provide talking points that give protective guidance ("Protective Action Guidelines" (PAG) e.g., worker health and safety; decontamination, evacuation vs. shelter-in-place); information on the zone of exclusion, and where/how to seek care	
44. Provide information (when available) for Medical Providers seeking treatment and management guidance and algorithms.(REMM)	
45. Identify SMEs on medical and public health aspects of radiation health	
46. Identify HHS spokesperson(s)	
47. Ensure that in communicating with the public, the needs of at risk, such as individuals with disabilities and individuals with limited English proficiency, are taken into account	
48. Ensure communication with the at risk population, including limited English proficient individuals and individuals with disabilities	

Phase II: Intermediate Phase (12-72 Hours Post Detonation RDD)

Phase II: Intermediate Phase (12-72 Hours Post Detonation RDD)	
Trigger Point	**Arrival of Federal Assets to Locale of Detonation**
ESF #8 Strategy	**Rapidly deploy ESF #8 assets to assist state, tribal, ,or local officials providing assistance where needed in saving lives, minimizing adverse health effects, stabilizing public health, medical and human services infrastructure.**

Phase II Actions/Issues	**Lead/Support Agency**
A. PLANNING AND COORDINATION	
1. Coordinate rapid needs assessments with FEMA (public health, medical and human services infrastructure)	EMG
2. Adjust HHS-EMG Staffing levels as required a. Expand Ops, Planning, Log, A&F and SME cells as required b. Request additional LNOs from ESF #8 partners as required (e.g., DOT, DoD, VA, DHS/FEMA, ARC, DOE, EPA, OSHA)	EMG/OFRD/ESF #8 Partners
3. Make necessary adjustments to pre-scripted Sub Tasks	EMG – OPS/A&F
4. Update situational awareness of hospital and healthcare infrastructure facilities (including power, water and debris) in the impact zone. Determine capability to continue operations.	EMG-CIKR
5. Prepare tasks for USACE/ESF#3 to prioritize continuity of operations for hospital and healthcare infrastructure facilities (includes power, water and debris removal).	EMG-CIKR/USACE/DoD
6. Review damage assessments and consult with FEMA regarding whether activation of ESF #14 is required	EMG/ FEMA Recovery LNO/ OPEO-CIKR/IGA
7. Develop common operating picture for long-term recovery and establish a transition to recovery plan	EMG plans/ FEMA Recovery liaison/ OPEO-CIKR

Phase II Actions/Issues	Lead/Support Agency
8. Produce ongoing and accurate public health, medical and human services status assessments, including status of at-risk population and service animals	EMG, OCR
9. Coordinate the requirement for Medicare/Medicaid and other statutory waivers for health, human services and other Federal benefits	EMG/CMS/ACF/AoA/OCR SAMHSA/FEMA Recovery Liaison
10. Expedite new or re-enrollment into health and human services Federal Benefits	EMG/HSG
11. Capture after-action comments	ALL
B. HEALTHCARE, EMERGENCY RESPONSE AND HUMAN SERVICES	
12. Deploy additional NDMS and PHS assets as required	EMG/NDMS/OFRD
13. Deploy staged personnel in accordance with Mission Assignments • Additional IRCTs as needed • ESF #8/HHS Teams (MERT, NMRT, DMORT-WMD, etc) • LNOs • Federal and non Federal partners	EMG/OFRD/VA/DoD/ACF/ IGA
14. Make necessary recommendations for at-risk persons regarding support needed	EMG/OD/ACF/OCR/OPEO-Human Services Group
15. Assess the need to use the Emergency System for Advance Registration of Voluntary Health Professionals (ESAR-VHP).	EMG /OPEO Hospital Program
16. Assess need for MRC Federal-level activation	EMG/OPHS-MRC
17. Receive, process, track and sub-task (as needed) MAs	EMG A&F
18. Conduct and maintain Situational Awareness reporting, including reporting regarding the at-risk population	IRCT/SOC/EMG
19. Deploy ESF #8 medical and public health and HHS human services teams to augment shelters	ACF

Phase II Actions/Issues	Lead/Support Agency
20. Coordinate medical care support for mass care requirements	EMG/ACF
21. Deploy assets in support of fatality management as requested.	EMG/NDMS
C. SURVEILLANCE, INVESTIGATION, AND PROTECTIVE HEALTH MEASURES	
22. Update dose rate data for responders and for potential reentry into safe regions	EMG-SME/EPA, DOE, CDC
23. Assist states with surveillance for outbreak/reports of abnormal disease or disease rates and "pockets" of at-risk population in the affected areas, including the community, medical facilities, and shelters.	EMG/CDC/OCR
24. Assist states through direct or technical assistance in the collection and analysis of data from injury, illness and mortality surveillance activities	EMG/CDC
25. Provide CDC staff to supplement state efforts to address identified public health issues/concerns	EMG/CDC
26. Conduct inspections and assess damage to FDA-regulated industry in impacted areas	EMG/FDA
27. Assist states with collection/analysis of FDA-regulated product samples	EMG/FDA
28. Provide technical assistance or subject matter expertise to states related to FDA-regulated products (food, drug, medical device and biologics safety) and conduct assessment of food retail establishments in impacted area.	EMG/FDA
29. Conduct active review all adverse event reports related to FDA-regulated products	EMG/FDA
30. Assist States with surveillance efforts to determine product integrity of pharmaceuticals, medical supplies and equipment in aftermath of incident.	EMG/FDA
D. PHARMACEUTICALS, MEDICAL SUPPLIES AND EQUIPMENT:	
31. Identify updated countermeasures, medical supplies and equipment	EMG-SME
32. Establish procedures for SNS shipments of necessary countermeasures, medical supplies, and equipment to affected area	ENG/LOG/CDC/IRCT
33. Activate Emergency Prescription Assistance Program (EPAP)	IRCT/CMS

Phase II Actions/Issues	Lead/Support Agency
E. PATIENT EVACUATION	
34. Review and adjust patient evacuation/repatriation plans with ESF #8 partners.	EMG/ NDMS/ DOT/ DoD/ VA/ ACF/ OD
F. COMMUNICATIONS AND OUTREACH	
35. Continue situation briefing/conference calls for ESF partners and OPDIVS/STAFFDIVS	ALL
36. Continue to participate in NICCL. • Continue providing information and anticipatory guidance to the public, including the at-risk population. • Reiterate rationale for difficult decisions that must be made due to overwhelming need in the context of resource scarcity (e.g. first priority is to save as many lives as possible). • Continue providing talking points on worker health and safety; decontamination, evacuation vs. shelter-in-place); information on the zone of exclusion, and where/how to seek care. • Maintain hotline capacity for medical and behavioral health questions. • Disseminate information on volunteer opportunities and rostering mechanisms (phone line, internet) decontamination, evacuation vs. shelter-in-place); information on the radiation zone, and where/how to seek care.	HHS, DHS, ASPA, CDC, OCR

Phase III: Intermediate/Late Phase (72 Hours – 2 Weeks Post Detonation)	
Trigger Point	**Patients in Definitive Care**
ESF #8 Strategy	**To Effect a Smooth and Transparent Transition to Long- Term Recovery**

Phase III Actions/Issues	Lead/Support Agency
A. PLANNING AND COORDINATION	
1. Report to FEMA and local authorities on progress development in restoring minimal functionality to the medical and public health infrastructures	EMG/ FEMA recovery liaison/OPEO CIKR/DHS
2. At the direction of the JFO/NRCC, implement demobilization and deactivation plan for the release of appropriate ESF #8 components.	EMG
3. Adjust ESF #8 assets to ensure (a) continued visibility on the execution of longer term Mission Assignments and (b) maintain situational awareness to support additional response operations.	EMG
4. Capture items for the draft after-action report	TELL
5. Coordinate with IRCT and ESF#8 supporting agencies, the demobilization of ESF#8 resources when all operational objectives contained in the ESF#8 Incident Action Plan have been met or affected State, or DHS determines that resources are no longer needed.	EMG-OPEO-CIKR/FEMA Recovery Liaison
6. Deactivate and demobilize specific response assets when its specific task or Mission Assignment is completed.	EMG/DHS
7. Adjust HHS-EMG operations commensurate with field activities including all LNOs	EMG
8. Develop a demobilization plan	EMG ALL/IRCT
9. Coordinate the transition to recovery activities with OPDIV/STAFFDIVS	FEMA Recovery Liaison/ OPDIVS/STAFFDIVS
B. HEALTHCARE, EMERGENCY RESPONSE AND HUMAN SERVICES	
10. Transition response to State and local authorities	ALL
11. Demobilize personnel as required in accordance with MAs completion	ALL
12. Transition to routine operations for OPDIVs as appropriate.	ALL
C. SURVEILLANCE, INVESTIGATION, AND PROTECTIVE HEALTH MEASURES	
13. Determine need and requirements for long-term post-event surveillance or investigation, including	EMG/CDC, NCI, OCR

Phase III Actions/Issues	Lead/Support Agency
surveillance of at risk population.	
14. Continue assistance to States regarding surveillance efforts, including surveillance of at risk population.	EMG/CDC/OCR
15. Continue to coordinate with state, local, and tribal environmental health department to ascertain ongoing and/or anticipated need for technical assistance, consultation, and support	EMG
16. Continue to monitor worker safety and physical and mental health	EMG
17. Continue inspections of FDA regulated industry and work with states as needed to assess retail food establishments in impacted areas	EMG/FDA
18. Continue to assist states through collection and/or analysis of FDA-regulated product samples.	EMG/FDA
19. Continue to provide states technical assistance or subject matter expertise related to FDA-regulated products food, drug, medical device and biologics safety; water safety as it affects FDA-regulated products; informed consent; clinical trials	EMG/FDA
20. Continue to review all adverse event reports related to FDA-regulated products	EMG/FDA
D. PHARMACEUTICALS, MEDICAL SUPPLIES AND EQUIPMENT:	
21. Establish procedures for follow on shipments of necessary countermeasures, medical supplies, and equipment to affected area.	EMG-Log/DHS/FEMA
22. As situation warrants, begin SNS redeployment/recovery/transition planning	EMG Log /CDC/IRCT
23. Inventory and return non-essential equipment for reconstitution	ALL
E. PATIENT EVACUATION	
24. Continue patient evacuation	EMG
F. COMMUNICATIONS AND OUTREACH	
25. Continue situation briefing/conference calls for ESF partners and OPDIVS/STAFFDIVS until demobilization complete.	HHS, EMG
26. Continue coordination with IRCT until demobilization.	EMG

ESF #8 Pre-Scripted Mission Assignments (PSMAs)

HHS has nineteen (19) ESF #8 pre-scripted mission assignments in place with the Federal Emergency Management Agency (FEMA) which provide mutually agreed upon language to expedite deployment of response assets and allow HHS to be proactive in moving personnel and equipment/supplies in anticipation of a disaster declaration:

Operational PSMAs

1. Public Health Services
2. Medical Care and Support
3. Federal Medical Stations (FMS)
4. Personnel Augmentation at Existing Health Care Facilities
5. NDMS Patient movement
6. ESF #8 (includes DMAT, NVRT, DMORT)
7. Food and Product Safety Inspection
8. Worker Health and Safety
9. Behavioral Health Care
10. Environmental Health -Hazard Identification and Control Measures
11. Mortuary Operations Assistance (Non-NDMS)
12. Veterinary Medical Support (Non-NDMS)
13. Incident Response Coordination Team (IRCT)
14. Emergency Prescription Assistance and Medical Equipment Replacement Program (EPAP)
15. Technical Assistance

Activation PSMAs

16. Pre-declaration Activation to National Response Coordination Center (NRCC)
17. Post-declaration Activation to National Response Coordination Center (NRCC)

18. Pre-declaration Activation to Regional Response Coordination Center (RRCC)
19. Post-declaration Activation to Regional Response Coordination Center (RRCC)

The following ESF #8 Pre-Scripted Sub-Tasks represent potential requirements that may be sub-tasked by HHS to ESF #8 Federal Partners and HHS operating and staff divisions.

ESF #8 Pre-Scripted Sub-Tasks 2009

DHS/FEMA

1. Establish and operate a shelter collocated with a Federal Medical Station at [Location] from [Start Date] to [End Date] to support non-medical care givers and family members accompanying patients being treated at the FMS.

DHS/Coast Guard

1. Request Coast Guard to provide all weather rotary wing aircraft lift support from [Location] to [Location]. Capability must provide all weather, all terrain patient movement, search and rescue, hospital ship lifeline missions, forward surgical team transport, medical logistics re-supply, medical personnel movement, and disaster/humanitarian relief support.

DHS/FEMA/LOG

1. Provide, all non-medical logistic and base operating support for deployed medical personnel and support personnel to include food, shelter, fuel, ground transportation, and line item resupply for [Location] from [Start Date] to [End Date].

2. Provide a National Medical Resupply system to ESF #8 assets within one week following the deployment of the first FMS or ESF #8 asset. A system will be established in the affected area to ensure the capability to fill requisitions within 24 hours of receipt.

3. Provide [Base/Location] as a FEMA MOB center to support forward distribution of supplies / equipment to affected area. Provide billeting (barracks facilities are acceptable) and life support, to include meals and hygiene facilities, for [Number] personnel; marshalling area for up to

[Number] trucks and trailers; [Number] sq. feet of covered storage; office and desks space for [Number] personnel; and Materiel Handling Equipment (MHE)/lift capability to offload [Type of Supplies/Equipment] from [Type of Vehicles/Aircraft].

4. Provide [Base/Location] as an Operational Staging Area to support forward distribution of supplies/equipment to affected area. Provide marshalling area for up to [Number] trucks and trailers; [Number] sq. feet of covered storage; and Materiel Handling Equipment (MHE)/lift capability to offload [Type of Supplies/Equipment] from [Type of Vehicles/Aircraft].

5. Provide capability to conduct fuel distribution operations at [Number] different points. Each point must provide the capacity to issue [Number] gallons of diesel fuel and/or [Number] gallons of unleaded gasoline. Fuel points must have appropriate nozzles to provide retail re-supply to first responders and commercial ground vehicles. Points must be operational by [Date/Time] at [Location].

6. Establish and operate [Number] Distribution centers for issue of emergency relief supplies for [Number] days.

Department of Justice (DOJ)

1. Provide security/police officers to furnish 24 hour security for Federal Medical Stations and medical base operating camps at [Location] from [Start Date] to [End Date]

2. Provide police escorts for medical ground transportation, medical personnel teams, medical re-supply shipments, and points of medical evacuation at departure and receiving hubs.

3. Provide security/police officers embedded with deployed Disaster Medical Assistance Teams (DMATs) to secure operations.

Department of Labor (DOL)

1. Request monitoring of occupational health effects and injury to ensure the safety of federal responders providing or otherwise rendering assistance at [Location] from [Start Date] to [End Date].

Veteran's Affairs (VA)

1. Request VA to augment the staffing of a Federal Medical Station, to include the following quantities and types of medical personnel: [Number] [Specify Type of Physician], [Number] [Specify Type of Registered Nurses], [Number] LPNs, and [Number] [Specify Type of Other Ancillary Support Personnel] to support patient care at [Location] from [Start Date] to [End Date]. Request that VA identify available personnel within 24 hours, and coordinate transportation so ensure that these personnel arrive at [Location] within 48 hours.

2. Request VA staff and operate a Federal Medical Station, to include the following quantities and types of medical personnel: [Number] [Specify Type of Physician], [Number] [Specify Type of Registered Nurses], [Number] LPNs, and [Number] [Specify Type of Other Ancillary Support Personnel] to support patient care at [Location] from [Start Date] to [End Date]. Request that VA identify available personnel within 24 hours, and coordinate transportation so ensure that these personnel arrive at [Location] within 48 hours.

3. Request VA to provide [Number] VA Medical Center (VAMC) beds to care for [Number] displaced patients from [Start Date] to [End Date]. Request that VA identify and report available VAMC beds within 18 hours.

4. Request VA to provide assistance for procurement of medical items. Support to include arranging for transportation and shipping from source to [Location]. Request that VA process the request through the VA National Acquisition Center (NAC) within 18 hours.

5. Request VA to provide and staff available mobile health clinics to provide primary medical care for [Number] of patients at [Location] from [Start Date] to [End Date]. Request that VA identify available mobile health clinics within 24 hours, and coordinate their movement to ensure that these assets arrive at [Location] within 48 hours.

6. Request VA to activate FCCs in FEMA region(s) X, Y and Z. NDMS Patient Reception and Definitive Care will be accomplished in accordance with the most current Federal Coordinating Center Guide.

7. FCC patient reception plans are to be implemented within 6 hours, including alert of patient reception teams (PRT). Preparations are to be made to receive patients within 2 hours of notification of incoming patient movement missions. All activated FCCs are authorized reimbursement of up to $30,000 per FCC for expenses related to preparations for patient reception. Those FCCs that are notified of incoming

missions necessitating PRT utilization are authorized reimbursement of up to $250,000 per FCC for expenses relating to the receipt, triage, disposition, tracking and transportation of patients.

Center for Disease Control and Prevention (CDC)

1. Deploy epidemiological surveillance teams to monitor conditions with local and state authorities. Objective is to provide guidance and implement procedures to reduce the possibility of disease outbreaks

2. Deploy NIOSH personnel to help coordinate workers safety recommendations and information dissemination. Be prepared to deploy up to 6 teams to the affected area for a period of no longer than 60 days.

3. Deploy personnel to provide technical support and expertise in the characterization of complex, unknown, and multiple contaminants worker exposures.

4. Deploy Federal Medical Stations, in 250 bed configuration with medical supplies to support non-acute, non-surgical, non-traumatic, non-chronic patients for a period of no less than 72 hours. Establish a medical resupply system to continue operations for a period not to exceed 60 days.

5. Deploy epidemiological teams in support of local and state authorities to monitor health care facilities. Working with local authorities, determine current status of health care facilities to conduct out patient treatment, inpatient treatment and surgical care. Assist the facility and make recommendations to improve the capability. Provide assistance for this requirement for no less than 60 days.

6. Deploy environmental health teams, to make recommendations and provide assistance to reestablish water systems in the affected area.

7. Deploy environmental health teams to evaluate environmental conditions in the affected area. Provide consultation and recommendations to improve the situation to return the area to normal, precautions to consider, information to the public on potential hazards. Work in collaboration with local authorities and the LFA EPA (chemical, radiation, sanitation, water quality, solid waste disposal).

8. Deploy surveillance teams to conduct vector surveillance and make recommendations to local authorities for vector control measures and techniques. Be prepared to coordinate aerial spraying. Be prepared to conduct pre spraying population interviews and post spraying interviews.

9. Deploy Strategic National Stockpile (ESF #8) assets and supporting personnel.

10. Deploy epidemiology/surveillance teams to assess the public health consequences of the natural disaster, including risk assessment and available resources.

11. Deploy veterinary surveillance teams to support ESF-6 and ESF-11 authorities to evaluate, make recommendations and provide assistance to temporary shelters and existing veterinary clinical care facilities. Determine if existing veterinary facilities are able to conduct routine out-patient and in-patient treatment and surgical care. Assist the facilities and make recommendations to improve the capability. Provide assistance to this requirement for a period not to exceed 60 days.

12. Deploy veterinary public health surveillance teams to rapidly determine and report event-related morbidity, mortality, and environmental exposures of service and companion animals to the local Incident Command, and make recommendations for treatment and mitigation.

Food and Drug Administration (FDA)

1. Perform inspections of establishments serving food at retail for conformance to appropriate food safety standards. Such establishments may include restaurants, school and hospital cafeterias; day care center food service establishments, temporary shelters, among others. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

2. Perform sample collections of human and/or animal foods, human and/or animal drugs, biologics and medical devices for subsequent analyses. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

3. Perform inspections of pharmacies and other establishments offering human and/or animal drugs, biologics and medical devices at retail to assist in assuring such drugs, biologics and medical devices have been stored under appropriate conditions and are fit for use. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

4. Analyze samples of foods, drugs, cosmetics and/or medical devices for attributes, as necessary, to assist in providing assurance that these commodities are fit for use. We request these analyses take place in FDA fixed site and/or mobile laboratories with staff and facilities available to begin these activities by [Date]; completion is expected to occur on/about [Date].

5. Conduct assessments (field tests) of facilities where diagnostic x-ray and mammography equipment are installed, to help assure the equipment is operating within acceptable radiation emission limits. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

6. Address issues that impact whether human and/or animal drugs, biologics, human and/or animal foods, and medical devices are appropriate for use; and/or to provide guidance on what steps, if any, may be employed to restore human and/or animal drugs, biologics, human and/or animal foods and medical devices to a condition whereby they would be fit for use. We request this expertise begin on/about [Date]; completion is expected to occur on/about [Date].

7. Provide training in food safety preparation, handling and storage to volunteers and/or other appropriate disaster response personnel. This additional staff is requested to begin this training on/about [Date]; completion is expected to occur on/about [Date].

8. Conduct inspections of establishments which prepare, pack or hold human and/or animal food, human and/or animal drugs, biologics, cosmetics and/or medical devices to assure such commodities are safe, effective and fit for use. This additional staff is requested to begin this training on/about [Date]; completion is expected to occur on/about [Date].

Indian Health Service (IHS)

1. The Indian Health Service (IHS) has a requirement to support the National Response Plan “Tribal Annex” with personnel to address public health and medical support for the American Indian/Native Alaskan (AI/NA). To create this capability IHS will request Agency personnel to act as Liaison Officers at the Regional Response Coordination Centers (RRCC) and the Joint Field Office (JFO) location as appropriate. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

2. IHS will have a requirement to open existing Mobilization Centers (Nashville and Albuquerque) with personnel and prepare for the deployment of IHS Teams to support the AI/AN Community and other non-tribal communities. This additional staff is requested to begin these activities on/about [Start Date]; completion is expected to occur on/about [End Date].

3. IHS will pre-stage Rapid Needs Assessment Team and Primary Care Task Force personnel in an effort to provide immediate engagement in the necessary response efforts in the AI/AN Community and other non-tribal communities. This additional staff is requested to begin these activities on/about [Date]; completion is expected to occur on/about [Date].

Department of Defense (DOD)

1. Patient Transport and Strategic Airlift (Rotary Wing medevac/lift support):

Personnel and lift are required by [Date] at [Location] for [Number] days to [Location].

DOD should be prepared to provide the capability to provide all weather, all terrain evacuation, shore to ship capability, medical personnel movement, medical logistics re-supply, medical regulating, and support to disaster assistance/humanitarian relief operations for an estimated [Number] personnel.

Personnel will work in [Type of Uniform]. Any protective clothing, if required, and any equipment will be provided by [Agency/Department].

2. Patient Transport and Strategic Airlift (Coordination, Medical Regulating and Tracking Support):

Personnel and vehicles are required [Date] at [Location] for [Number] days to [Location].

DOD should be prepared to provide the capability to move [Number] personnel by ground transportation with accompanying medical attendants to move the anticipated [Number] casualties.

DOD should be prepared to provide the capability to coordinate lift-bed planning in support of all patient movement, provide medical regulating assistance, provide assistance in tracking the movement of all patient movement utilizing TRAC2ES to move [Number] patients/casualties from [Location] to [Location].

3. Surge Medical Capability and Installation Support to Civilian Agencies:

Provide DOD medical personnel augmentation to support staffing of a Federal Medical Station for [Describe Type of Medical Capability; i.e. Surgical, Medical]; and approximately [Number] [Specify Type of Personnel] are required by [Date] for [Number] days to [Location].

Provide a DOD Installation in the vicinity of [Location] to serve as a federal logistical staging area and mobilization center, beginning on [Date] for [Number] days, until [Date].

4. Surge Medical Capability Support to Civilian Agencies:

Provide DOD personnel augmentation capability for [Describe Type of Medical Capability; i.e. surgical, medical, nursing, respiratory, mental health] support, specifically in support of [Describe Type of Medical Capability], approximately [Number] of personnel), a minimum [Number] of [Specify Type of Personnel] are required for [Number] days to [Location].

5. Mortuary Affairs/Fatality Management Support

Provide DOD personnel capability for victim identification in support of the recovery and identification of remains, approximately [Number] of [Specify Type of Capability or Personnel], and are required by [Date] for [Number]) days to [Location].

6. Blood Supply/Distribution Support:

Provide blood banking/distribution/supply capability to [Facility/ies] as required from [Start Date] to [End Date].

7. Vector Control.

Provide vector control capability including aerial spraying of [Location] as required from [Start Date] to [End Date].

Essential Elements of Information

ESF #8 Incident Manager (Radiological Dispersal Device Information Collection Plan)

This is a template for an RDD response Information Collection Plan (ICP). It is designed to provide a reference document for the Emergency Management Group (EMG) Information Cell when collecting information regarding RDD response. It is not designed to be used “as is” and must be modified to obtain the maximum benefit. EEIs should be added or deleted to the ICP for each operational period depending on the specific circumstances and phase of response. The two broad categories of EEIs to be collected are “Incident Specific EEIs” and “ESF #8 Functional Element EEIs”. The “Incident Specific EEIs” are designed to provide the Incident Manager (IM) situational awareness of the incident. The “ESF #8 Functional Element EEIs” are taken from the National Response Plan and are designed to provide the IM the information necessary to be appraised of the status of each of the functional areas of ESF #8 response that he/she is responsible for.

The Information Cell is responsible for completion of the matrix with the assistance of the Department/Agency (D/A) or OPDIV/STAFFDIV identified to provide input. It is preferable to distribute the plan prior to the start of the next operational period to allow providing agencies and elements planning and acquisition time.

Instructions for Completion of ESF #8 Essential Elements of Information (EEI) Worksheet for Radiological Dispersal Device (RDD) Response Prior to distributing the ICP, the Information Cell should select the EEIs that are to be collected for the Operating Period specified.

Column 1, EEI Number - The reference number assigned to each EEI to be collected.

Column 2, Essential Element of Information – The category/functional element of data to be collected.

Column 3, Specific Information Required - The question to be answered or data to be provided by Department/Agency (D/A) or OPDIV/STAFFDIV identified in Column 4.

Column 4, Data Collector(s) - The Department/Agency (D/A) or OPDIV/STAFFDIV responsible for providing the requested information to the Information Cell.

Column 5, Data Source(s) – To be completed by the Data Collector. The source used by the data collector. Specify the name of report, providing agency, etc.

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
1	Plume Modeling and Related Information	What is the projected location and spread of the plume in the potentially affected areas, to include the IMAAC plume models?	ASPR (SOC Watch Officers) POC: SOC Watch Officers	IMAAC
2	Radiation Measurements - Environmental	Have environmental radiation measurements been accomplished in the affected area(s)?	ASPR (SOC Watch Officers) POC: SOC Watch Officers CDC & Advisory Team for Environment, Food, and Health	First Responders State and Local Radiation Monitoring Teams Federal Radiological Monitoring and Assessment Center (FRMAC) Monitoring Teams
3	Radiation Measurements - Human Laboratory Analysis and Health Physics	Have the Radiation Laboratory Response Network (RadLRN) Labs been alerted, what is the status?	ASPR (Planning) POC: SOC Watch Officers	Radiation Laboratory Response Network (RadLRN) CDC Radionuclide Assay Lab and

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
				Health Physicists
4	Radiation Exposure Assessments - Human Laboratory Analysis and Health Physics	Has CDC been alerted to deploy for human bioassay, contamination/dose assessment, and consultation in victim decontamination?	ASPR (Planning) POC: SOC Watch Officers	Radiation Laboratory Response Network (RadLRN) CDC Radionuclide Assay Lab and Health Physicists
5	Radiation Exposure Measurement	Are CDC health physicists alerted to deploy for field dosimetry and consultation in victim decontamination?	ASPR (Planning) POC: SOC Watch Officers	CDC
6	Medical Management	Has the Radiation Injury Treatment Network (RITN) been alerted?	ASPR (Planning) POC: SOC Watch Officers	Radiation Injury Treatment Network (RITN)
7	Medical Management	Has a Joint Field Office been established?	ASPR (Planning) POC: SOC Watch Officers	Radiation Injury Treatment Network (RITN) ABA
8	Planning and Coordination	Has a Joint Field Office been established?	ASPR (Operations)	FEMA

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
			POC: EMG Ops	
9	Planning and Coordination	What response elements (if any) have deployed, including ERT-A, Human Services Assessment Teams, etc.?	ASPR (Operations) POC: EMG Ops	FEMA
10	Staging Bases	When will DHS/FEMA identify staging bases?	ASPR (Operations) POC: EMG Ops	FEMA
11	Staging Bases	Where are the pre-staging bases?	ASPR (Operations) POC: EMG Ops	FEMA
12	Logistical Support	When will DHS/FEMA provide all non-medical logistical support to deploying federal partner personnel/teams?	ASPR (Logistics) POC: EMG Logs	ESF#8 Logistics Chief in JFO
13	Logistical Support	Is DOD assistance available to provide installation support for Federal medical capabilities? What are the base operating support requirements for the type of Federal medical capabilities that the Primary Agency projects will be utilizing at DOD installations? What are the requirements for personnel lodging and sustenance	DoD POC:	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
		(meals, etc.)?		
14	Logistical Support	What staging areas are being used by Federal responders?	ASPR (Logistics) POC: EMG Logs	FEMA
15	Logistical Support	What systems are in place to distribute necessary supplies, equipment and support for infrastructure deficits?	ASPR (Logistics) POC: EMG Logs	Quarter Master Inventory System
16	Transportation	Is DOD assistance available to provide bulk transport support for medical supplies/equipment/personnel?	DoD POC:	
17	Transportation	What is the status of transportation (assets and routes, including air, ground, rail and accessible transportation)?	DOT POC:	
18	Communications	Have communications been established with the JIC and State EOCs?	ASPA and EMG Ops POC: EMG Public Affairs	PAO and RECs
19	Assessment of Public Health/Medical Needs	What is the status of critical infrastructure in the affected area(s) (i.e. hospitals, urgent care facilities, EMS service, local/state public health departments, and mental health clinics)	IRCT, ASPR CIKR, SOC POC: SOC	
20	Assessment of Public Health/Medical Needs	What health services are available? Where?	IRCT, CDC, ASPR CIKR POC: SOC	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
21	Assessment of Public Health/Medical Needs	What is the status of environmental assessments (i.e., air and water quality, etc.)?	CDC POC: DEOC Operations Support Branch	
22	Assessment of Public Health/Medical Needs	What damage has occurred in the affected area (including injuries/fatalities)?	IRCT, ERT-A POC:	
23	Communications	What is the status of local/state public health public communication channels and technologies, including TTY and alternate formats, and services for persons with limited English proficiency? Have essential services been restored? Status of progress?	IRCT POC:	
24	Assessment of Public Health Needs	What is the State/Local policy for allowing citizens/people to return home?	IRCT POC:	
25	Health Surveillance	What are the illness and injury surveillance needs and capabilities of the potentially affected state(s)?	CDC POC: DEOC Operations Support Branch	
26	Health Surveillance	Have there been any outbreaks/reports of abnormal diseases or disease rates?	CDC POC: DEOC	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
			Operations Support Branch	
27	Health Surveillance	Have outbreaks/reports of abnormal disease/injury or disease/injury rates been restored to pre-event levels?	CDC POC: DEOC Operations Support Branch	
28	Medical Care Personnel	What is the status of deploying personnel physical and mental health screening and availability of crisis counseling, vaccinations, immunizations, and other drug preventatives that may be needed?	OFRD,CDC, NDMS, ASPR, FOH, FDA, IHS POC:	
29	Medical Care Personnel	What capabilities by specialty will be required? (as an example for FMS)	ASPR (Planning) POC: EMG plans	RNA, MNAT, IRCT
30	Health/Medical Equipment and Supplies	Are SNS assets being pre-positioned; and if so, where are the intended sites	ASPR (Logistics), CDC POC: EMG Logs	
31	Health/Medical Equipment and Supplies	Does the potentially affected state(s) have adequate vaccination/immunization supplies? (or what percentage of the population can be covered?)	CDC POC: DEOC Operations Support Branch	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
32	Health/Medical Equipment and Supplies	What is the projected requirement for medical supplies/ pharmaceuticals?	ASPR (Logistics), IRCT POC: EMG Logs	
33	Medical Management	What is the projected requirement for materiel and countermeasures for RDD response? What is the status of SNS?	ASPR (Logistics), IRCT POC: EMG Logs	CDC/SNS
34	Health/Medical Equipment and Supplies	Is DOD assistance available to provide critical medical resource logistics and distribution support?	DoD POC:	
35	Health/Medical Equipment and Supplies	What is the Federal plan for distribution and allocation of medical supplies to include main and alternate supply points and supporting terminals to be used or considered?	ASPR (Logistics) POC: EMG Logs	CDC/SNS
36	Health/Medical Equipment and Supplies	What are the Federal recommended levels of supply? And critical replenishment points?	ASPR (Logistics) POC: EMG Logs	FEMA Mob Centers
37	Health/Medical Equipment and Supplies	What are the recommended procedures for Federal use and local acquisition of supplies and services?	ASPR (Logistics) POC: EMG Logs	Contracting Officer
38	Patient Evacuation	Will DoD permit the use of TRAC2ES and the GPMRC to monitor and track all patient movements (air, sea, and ground), including movement of at-risk populations?	DoD POC:	
39	Patient Evacuation	How far in advance will the determination for mandatory evacuation of the possible evacuation impact area be made?	ASPR (Planning)	NRCC Liaison, RRCC Liaison

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
			POC: EMG plans	
40	Patient Evacuation	What measures are State and local officials taking to accommodate inbound relief traffic in light of possible evacuation route (counter flow)?	DOT POC:	
41	Patient Evacuation	Have evacuation/relocation sites been identified?	ASPR (Planning) POC: EMG plans	NRCC Liaison, RRCC Liaison
42	Patient Evacuation	Will Federal assistance be needed to evacuate patients in nursing homes, assisted living, or other residential care facilities?	ASPR (Planning) POC: EMG plans	RNA
43	Patient Evacuation	What is the projected requirement for the pre- and post-hospitalization regulating of patients (including at-risk), in order to integrate patients with transportation assets and definitive care facilities?	ASPR (Planning) POC: EMG plans	RNA
44	Patient Evacuation	Is DOD assistance available to provide patient transport/strategic lift capability support? and movement into definitive care (hospitals)?	DoD POC:	
45	Patient Evacuation	What is the projected requirement for aeromedical evacuation (ambulatory and non-ambulatory), including at-risk population?	ASPR (Planning) POC: EMG plans	RNA
46	Patient Evacuation	Is DOD assistance available to provide patient transport/ground transport capability support, including at-risk populations?	DoD POC:	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
47	Patient Evacuation	What is the projected requirement for ground movement of patients, including at-risk populations?	ASPR (Planning) POC: EMG plans	RNA
48	Patient Care	Will FEMA establish mass care shelters in designated mobilization bases to care for non-medical attendants and family members of patients under the care of HHS Federal Medical Stations?	ASPR (Planning and Logistics) POC: EMG plans	
49	Patient Care	Is there a requirement for medical personnel to support Urban Search and Research Teams at staging areas and on missions (e.g., DMAT)?	ASPR (Planning) POC: EMG plans	
50	Patient Care	What is the hospital surge capacity in the anticipated path of the storm? Does it include at-risk needs?	ASPR (Planning) POC: EMG plans	
51	Patient Care	What is the NDMS bed availability? Does it include at-risk needs?	NDMS (VA, DoD) POC:	
52	Patient Care	What is the status of Federal health and medical facilities in the affected area?	VA, DoD, IHS, HRSA, SAMSHA POC:	
53	Patient Care	What are the safety and health recommendations for facilities that cannot be evacuated (if requested by the state)?	CMS POC:	See Regional Analysis and Louisiana Recovery

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
				Plan for facilities sheltering in place
54	Patient Care	Is DOD assistance available to provide medical surge capability support?	DoD POC:	
55	Patient Care	What is the non-NDMS bed status in the affected and surrounding areas, including at-risk population needs?	IRCT, OPEO CIKR POC:	
56	Patient Care	What is the status of each FMS: occupied beds, vacant/available beds, supplies & equipment, patient contacts and capacity for at-risk populations since last report?	IRCT POC:	
57	Safety and Security of Human Drugs, Biologics, Medical Devices, and Veterinary Drugs	What is the status of safety and security of human drugs, biologics, medical devices, and veterinary drugs in the affected area?	FDA POC: FDA EOC	
58	Blood and Blood Products	What is the projected requirement for blood product support?	ARC, AABBTF, DoD POC: AABBTF	
59	Food Safety	What number of FDA-regulated establishments (food, feed, drugs, medical devices, cosmetics) require inspectional follow-up by FDA?	FDA POC: FDA EOC	
60	Food Safety	What assistance have state officials requested from FDA, e.g., inspectional assistance, technical expertise, product sampling,	IRCT, FDA POC: FDA EOC	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
		and laboratory analysis?		
61	Animal Food and Drug Safety	What is the status of the affected companies/facilities manufacturing or distributing animal food/feed and veterinary drugs in the impacted area?	FDA POC: FDA EOC	
62	Worker Health/Safety	Are sufficient procedures in place to monitor the physical and mental health and well-being of emergency workers; perform field investigations and studies to address worker health and safety issues; and provide technical assistance and consultation on worker health and safety measures and precautions?	DOL, CDC/NIOSH POC:	
63	All-hazard Public Health and Medical Consultation, Technical Assistance and Support	Have assessments of all hazards been accomplished in the affected area (assessing exposures on the general population and the at-risk)?	CDC POC: DEOC Operations Support Branch	
64	Behavioral Health Care	What plan is in place to gather baseline behavioral health data on deploying HHS personnel?	FOH, ASPR POC:	
65	Behavioral Health Care	What is the plan for behavioral health surveillance during/after the operation?	FOH, ASPR POC:	
66	Behavioral Health Care	What is the plan for distributing behavioral health-based tips to deploying personnel’s families and workplaces?	FOH, ASPR POC:	
67	Behavioral Health Care	What procedures/processes are in place to ensure behavioral	FOH, ASPR	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
		health surveillance and prompt intervention is available as necessary	POC:	
68	Behavioral Health Care	What is the plan for behavioral health surveillance of assets deployed by HHS for ESF#8 missions?	IRCT POC:	
69	Behavioral Health Care	Has the potentially affected state(s) determined the status of in-patient behavioral health facilities? Are there any plans for evacuation?	POC:	
70	Behavioral Health Care	Does the potentially affected state(s) need behavioral health care support in advance of RDD event; If yes, what are the detailed requirements (what is needed, where, and when, etc.?)	POC:	
71	Behavioral Health Care	Does the potentially affected state(s) have adequate psychotropic medications? If not, develop detailed list of what needed, how much, by when?	POC:	
72	Behavioral Health Care	Does the potentially affected state(s) plan to use EMAC for behavioral health resources? If yes, what are the gaps to be filled by federal resources?	POC:	SAMSHA for consultation and technical
73	Behavioral Health Care	Based on the need for pre-staging of behavioral health assets, has DMAT deployed any behavioral health assets? If so, how many, where, with what mission(s)?	NDMS POC:	
74	Behavioral Health Care	What behavioral health assets can HHS OPDIVS and ESF#8 partners roster and deploy for prestaging?	OFRD, EMG Ops POC:	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
75	Behavioral Health Care	What is the projected requirement for DoD worker crisis counseling and mental health and substance abuse behavioral health capabilities/support?	DoD, ASPR (Human Services) POC:	
76	Behavioral Health Care	What does the State(s) need from the Federal Government for behavioral health care?	POC:	
77	Behavioral Health Care	What is the status of the need for behavioral health support to the FMS: diagnoses, occupied beds, vacant/available beds, types and amounts of psychotropics used, and patient contacts since last report?	POC:	SAMSHA for consultation and technical assistance
78	Behavioral Health Care	What is the status of behavioral healthcare infrastructure (e.g., hospitals, clinics, etc.)?	ASPR (Human Services) POC:	
79	Behavioral Health Care	What behavioral health care response elements (if any) have deployed, including IRCT, ERT-A, etc.?	ASPR (Operations) POC: EMG Ops	Human Services Rep to EMG
80	Behavioral Health Care	What is the plan for transitioning behavioral health care back to the state and local commuinities?	ASPR (Human Services) POC:	SAMSHA for consultation and technical assistance
81	Behavioral Health Care	On a daily basis, what behavioral health care assets can HHS OPDIVS and ESF#8 partners deploy in support of the state(s)?	OFRD, ASPR	SAMSHA for consultation and

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
			POC:	technical assistance
82	Behavioral Health Care	What is the current Common Operating Picture on federal behavioral health assets deployed in support of HHS' ESF#8	POC:	Human Services Rep to EMG
83	Behavioral Health Care	What is the state(s) plan on applying for FEMA crisis counseling grants? What state(s) need assistance?	POC:	Human Services Rep to EMG
84	Behavioral Health Care	What is the behavioral health bed status in the affected and surrounding areas/ status of NDMS? (Occupied Beds/ Vacant Beds/ Bed Requirements)	NDMS POC:	
85	Behavioral Health Care	What behavioral health assets can HHS OPDIVs and ESF#8 partners roster and deploy as necessary after landfall?	OFRD, ASPR POC:	
86	Behavioral Health Care	What is the forecasted need for behavioral health care resources over the next 72 hrs – 1 week?	POC:	
87	Behavioral Health Care	What behavioral health services are available and where?	POC:	SAMSHA for consultation and technical assistance
88	Behavioral Health Care	What is the status of behavioral health care facilities in the affected communities? Have essential services been restored to them? What is the status of providers? What are the locations/contact information for the facilities/providers?	POC:	SAMSHA for consultation and technical assistance
89	Behavioral Health Care	Have rates of psychiatric illness been restored to pre-event levels? Progress toward?	ASPR (Human Services)	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
			POC:	
90	Behavioral Health Care	How long will surveillance efforts continue to monitor the rate of psychiatric illnesses in the affected areas?	ASPR (Human Services) POC:	
91	Public Health and Medical Information	Has response included the preparation and distribution strategy for safety messages in print, alternative formats and PSAs for radio and/or TV, including use of sign language interpreters and other non-English languages (e.g., food and water safety consumption and contamination, guidelines for decontamination etc.)	CDC, ASPA, ASPR Human Services	
92	Public Health and Medical Information	What local partners and NGOs are operational in affected areas with the capacity to deliver critical health/safety information to affected individuals/areas, including the at-risk population?	IRCT POC:	
93	Public Health and Medical Information	Is there a threat from vector- borne disease?	CDC POC: DEOC Operations Support Branch	
94	Vector Control	Is vector control assistance needed?	CDC POC: DEOC Operations Support Branch	

EEI Number (1)	Essential Elements of Information (2)	Specific Information Required (3)	Data Collector (s) (4)	Data Source(s) (5)
95	Potable Water, Wastewater and Solid Waste Disposal	What is current status of potable water within the damaged area?	CDC POC: DEOC Operations Support Branch	
96	Potable Water, Wastewater and Solid Waste Disposal	Have environmental conditions (i.e. water supply, ground contamination) been restored to pre-event levels?	IRCT, CDC POC:	

List of Acronyms

List of Acronyms	
Acronym	**Description**
A&F	Admin & Finance
AABB	American Association of Blood Banks
AC	Assembly Center
ACF	Administration for Children and Families
AFRRI	Armed Forces Radiobiology Research Institute
AI/NA	American Indian/Native Alaskan
ALI	Annual Limit on Intake
ARC	American Red Cross
ARS	Acute Radiation Syndrome
ASPA	Assistant Secretary for Public Affairs
ASPR	Assistant Secretary for Preparedness and Response
A-Team	Advisory Team for Environment, Food and Health
CBRNE	Chemical, Biological, Radiological, Nuclear Explosive
CDC	Centers for Disease Control and Prevention
CIKR	Critical Infrastructure and Key Resources
CMS	Centers for Medicare and Medicaid Services

List of Acronyms	
CONOPS	Concept of Operations
D/A	Department/Agency
DHS	Department of Homeland Security
DMAT	Disaster Medical Assistance Team
DMORT	Disaster Mortuary Operational Response Team
DOD	Department of Defense
DOE	Department of Energy
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DPMU	Disaster Portable Morgue Unit
DSNS	Division of the Strategic National Stockpile
EEI	Essential Elements of Information
EMAC	Emergency Management Assistance Compact
EMG	Emergency Management Group
EMS	Emergency Medical System
EOC	Emergency Operation Center
EPA	Environmental Protection Agency
EPAP	Emergency Prescription Assistance & Medical Equipment Replacement Program
EPI-X	Epidemic Exchange

List of Acronyms	
ER	Emergency Room
ERT	Emergency Response Team
ERT-A	Emergency Response Team-Advance
ESAR-VHP	Emergency System for Advance Registration of Volunteer Health Professionals
ESF	Emergency Support Function
EUA	Emergency Use Authorization
FCC	Federal Coordination Center
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FMS	Federal Medical Station
FRMAC	Federal Radiological Monitoring and Assessment Center (DHS)
Gy	Gray (unit of radiation dose)
HAN	Health Alert Network
HHS	Department of Health and Human Services
HRSA	Health Resources and Services Administration
HSAS	Homeland Security Alert System
HSC	Homeland Security Council
IAP	Incident Action Plan
ICP	Information Collection Plan
ICU	Intensive Care Unit
IED	Improvised Explosive Device

List of Acronyms	
IGA	Office of Intergovernmental Affairs
IHS	Indian Health Service
IM	Incident Manager
IMAAC	Interagency Modeling & Atmospheric Assessment Center
IND	Improvised Nuclear Device
IND	Investigational New Drug (FDA)
IRCT	Incident Response Coordination Team
IRCT-A	Incident Response Coordination Team - Advance
JFO	Joint Field Office
JIC	Joint Information Center
LFA	Lead Federal Agency
LNO	Liaison Officer
LOG	Logistics
LRN	Laboratory Response Network
MC	Medical Care (sites)
MERT	Medical Emergency Response Team
MHE	Material Handling Equipment
MOB	Main Operating Base
MRC	Medical Reserve Corps
NAC	National Acquisition Center
NCI	National Cancer Institute

List of Acronyms	
NCRP	National Council on Radiation Protection
NDMS	National Disaster Medical System
NERDD	Non-Explosive Radiological Dispersal Device
NICCL	National Incident Communications Conference Line
NIH	National Institutes of Health
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety & Health
NLM	National Library of Medicine
NMDP	National Marrow Donor Program
NRCC	National Response Coordination Center
NRF	National Response Framework
NSS	National Security Staff
NVRT	National Veterinary Response Team
OCR	Office of Civil Rights
OD	Office of the Director (NIH)
OEM	Office of Emergency Management
OFRD	Office of Force Readiness & Deployment
OPDIV	Operating Division
OPEO	Office of Preparedness & Emergency Operations
OPHS	Office of Public Health and Science
OPS	Operations

List of Acronyms	
OSHA	Occupational Safety & Health Administration
PAG	Protective Action Guidelines
POC	Point of Contact
POD	Point of Dispensing
PPE	Personal Protective Equipment
PRT	Patient Reception Team
Rad	Radiation absorbed dose (now replaced by Gy- Gray)
Rad-LRN	Radiological Laboratory Response Network
RDD	Radiological dispersal device
REAC/TS	Radiation Emergency Assistance Center/Training Site
REC	Regional Emergency Coordinator
RED	Radiological exposure device
Rem	Roentgen Equivalent Man (used for medical management)
REMM	Radiological Event Medical Management system (NLM and HHS)
RERF	Radiological Effects Research Foundation
RITN	Radiation Injury Treatment Network
RNA	Ribonucleic Acid
RRCC	Regional Response Coordination Center
SAMHSA	Substance Abuse and Mental Health Services Administration
SME	Subject Matter Expert
SMI	Supplier Managed Inventory

List of Acronyms	
SNS	Strategic National Stockpile
SOC	Secretary’s Operation Center
StaffDiv	Staff Division
STTL	State, Territorial, Tribal, and Local
TELL	Training, Exercise and Lessons Learned
TRAC2ES	TRANSCOM Regulating and Command & Control Evacuation System
U.S.	United States
UA	Universal Adversaries
UMI	User Managed Inventory
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USG	United States Government
USPHS	United States Public Health Service
VA	Department of Veterans Affairs
VAMC	Veterans Affairs Medical Center
VMI	Vendor Managed Inventory