

# 9

## IA 9 – Nuclear/Radiological

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IA 9 Tasked Agencies	
<b>Primary Agencies</b>	Oregon Health Authority
<b>Supporting Agencies</b>	Oregon Department of Agriculture (ODA) Oregon Department of Energy (ODOE) Oregon Military Department (OMD) Oregon Emergency Management (OEM) Office of the State Fire Marshall (OSFM) Oregon Department of Environmental Quality (DEQ) Occupational Safety and Health Division (OSHD) Oregon Department of Fish and Wildlife (ODFW)
<b>Adjunct Agencies</b>	

## 1 Purpose

- The Nuclear/Radiological Incident Annex is responsible for providing a coordinated State of Oregon response to emergencies involving radioactive material and for determining and implementing measures to protect life, property, and the environment in a radiological emergency.
- Define the roles and responsibilities of state agencies in responding to the unique characteristics of different categories of nuclear/radiological incidents
- Discuss the specific authorities, capabilities, and assets the state government has for responding to nuclear/radiological incidents;
- Discuss the integration of the concept of operations with other elements of the Oregon Emergency Operations Plan (EOP), including the unique organization, notification, and activation processes and specialized incident-related actions; and
- Provide guidelines for notification, coordination, and leadership of State of Oregon nuclear/radiological response and recovery activities.

## 2 Scope

- “Nuclear or Radiological Incident” is defined as - terrorist incidents involving nuclear or radioactive materials, reactor plant accidents (commercial or weapons production facilities), lost radioactive material sources, transportation accidents involving nuclear/ radioactive material, and foreign accidents involving nuclear or radioactive material which impact the State of Oregon. Provide guidelines for notification, coordination, and leadership of State of Oregon nuclear/radiological response activities.
- This annex applies whenever an incident exceeds or is anticipated to exceed local or tribal resources. The level of state response to a specific incident is based on numerous factors including, the ability of local and tribal officials to respond; the type, amount, and custody of (or authority over) radioactive material involved; the extent of the

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impact or potential impact on the public and environment; and the size of the affected area.

- This annex provides information specific to a nuclear/radiological incident and is intended to supplement and correspond with the Oregon EOP including EOP ESFs #10 and #12. This annex does not alter existing state plans for nuclear/radiological incidents, county plans, or federal response plans.

### **3 Situation and Assumptions**

#### **3.1 Situation**

*\*taken from Oregon Health Authority's (OHA) "Public Health Radiological Emergency Response Plan"*

Radioactive materials are widely used in commercial applications, research laboratories, and in medical care facilities in Oregon. In addition, radioactive materials are found in the two experimental reactors located at Oregon State University (OSU) and Reed College. Radiation could be released as the result of an accident at a site (in the state and from surrounding states and locations outside of the United States) containing radioactive materials or as a deliberate act.

OHA will lead the state response and will make a radiological health assessment following an industrial accident or a terrorist attack when involvement of radioactive material is suspected by the on-scene Incident Commander or by another appropriate authority.

For incidents managed by the ODOE, OHA provides technical assistance to the Incident Commander and provides information on the health impact of the radioactive materials that are released. The public health response to the accidental or deliberate release of radiological materials will focus on protecting human health. A timely response is critical in limiting the health impact of public exposure to ionizing radiation, and it is essential in controlling the spread of radiological contaminants. A radiological incident may result in environmental contamination and thus the risk of ongoing human exposure and long-term health consequences. The incident may have psychological impacts among people who were not actually exposed, but who are still concerned about their health.

This plan discusses the following types of radiological incidents:

- Radioactive materials could be released as the result of an accident during the transportation of materials or at an industrial site that uses radioactive materials.
- Radioactive materials could be sprayed into the air, introduced into food or water, or left in public places. Such methods are not likely to produce mass casualties.
- A radiological dispersal device (RDD), or "dirty bomb," is a bomb that combines conventional explosives (such as dynamite or TNT) with radioactive materials. An RDD injures nearby people, damages

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buildings, and blasts radioactive materials into the area. An RDD attack is more likely to occur than other types of attacks because of the prevalence of commercial radioactive material and the relative ease of constructing an explosive device.

- An improvised nuclear device (IND) is an illicit nuclear weapon that is bought, stolen, or otherwise obtained from a nuclear State, or is a nuclear weapon fabricated from illegally obtained fissile nuclear weapons material. An IND creates a fireball that emits intense heat and light along with a shockwave, lethal ionizing radiation and fallout. Because an IND requires enriched uranium or plutonium and a more sophisticated knowledge of bomb-building, it is less likely to be used in a terrorist attack. If the IND does not reach nuclear yield due to malfunction or poor construction, the effects of the blast would be similar to a RDD.
- It may be necessary to provide backup communications from outside of the affected area to replace wired and wireless communication networks that could be affected by the electromagnetic pulse (EMP) generated by an IND explosion.

**3.2 Assumptions**

- The Federal Bureau of Investigation (FBI) leads the criminal investigation if the radiological release was intentional. The FBI is responsible for determining whether an explosion involved radioactive materials.
- Federal agencies, including the U.S. DOE, the Environmental Protection Agency (EPA), and the Nuclear Regulatory Commission (NRC), will provide resources and coordination when Oregon's resource demands exceed availability or when a radiological incident extends beyond state boundaries.
- The U.S. Centers for Disease Control and Prevention (CDC) is the lead federal agency to support public health actions when state capacity and expertise are exceeded.
- All State Agencies will be responsible for coordination and communication with their federal counterparts.
- Local health departments have jurisdiction in their communities for public health in coordination with OHA.
- Local government authorities have response plans in place to deal with a radiological emergency.
- The initial response phase may be complicated by the fact that the incident site could be a mass casualty scene, possibly a life-threatening hazard area, and a crime scene.

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- For a crime scene, it will be necessary to preserve the scene so that law enforcement can gather evidence.
- It may be necessary to provide medical treatment to on-scene victims, and victims may need to be decontaminated.
- The incident must be stabilized and the radioactive release stopped prior to initiation of recovery field operations.
- If a radiation plume exists, recovery operations may not begin until it is dissipated and all significant deposition has occurred.
- Radiation Protection Services (RPS) (in OHA) and regional hazardous materials (hazmat) teams (in the State Fire Marshal's office) are the lead state groups for technical radiological and decontamination expertise during recovery.
- Recovery personnel will be subject to the exposure limits for occupational workers in the Oregon Rules for the Control of Radiation (OAR, Chapter 333, divisions 100-123).
- Exposures will be maintained as low as reasonably achievable during recovery.

## **4 Roles and Responsibilities**

### **4.1 Primary Agency**

**Oregon Health Authority (OHA):** (More detailed roles and responsibilities information for OHA is located in the Public Health Radiological Response Plan)

- OHA is the lead state agency for all radiological incidents except transportation incidents and incidents at in-state and Hanford nuclear reactors and nuclear fuel storage facilities, which are managed by the ODOE.
- OHA provides technical assistance for all radiological incidents, from simple radiological accidents to terrorist incidents.
- OHA will provide and serve as the information point for informational outreach to the public and to State Agency PIOs.
- Establish and maintain Radiation Information toll free number during business hours.
- In conjunction with ESF #8:
  - Provides advice on proper medical treatment of the general population and emergency workers exposed or contaminated by radioactive materials;

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- Provides available medical countermeasures through deployment of the Strategic National Stockpile and other assets;
- Provides advice and guidance in assessing the impact of the effects of radiological incidents on the health of persons in the affected area; and,
- Provides support and guidance for monitoring and decontamination of the public;

**4.2 Supporting Agencies****4.2.1 Oregon Department of Energy (ODOE)**

- **Is the lead state agency for transportation-related radiological incidents in Oregon.**
- **The Oregon Department of Energy is also the lead state agency for radiological preparedness for an incident involving the Columbia Generating Station (CGS) nuclear power plant near Richland, Washington, as well as an incident at the Hanford nuclear site.** ODOE has extensive emergency response plans and procedures related to both sites. The CGS plan is reviewed and approved by FEMA.
- ODOE supports OHA in all other radiological events occurring in Oregon.
- ODOE staff is trained in assessing and coordinating response to a nuclear/radiological incident. ODOE has subject matter expertise on the Hanford Nuclear Site, on the CGS, and on radiological response procedures. ODOE has an Agency Emergency Operations Center which can be used in a response.
- ODOE has access to and an account through the U.S. Department of Energy's Consequence Management Data – which provides plume modeling.

**4.2.2 Oregon Department of Agriculture (ODA)**

- In situations where food supply contamination may be of concern, Oregon Department of Agriculture (ODA) and the Oregon Department of Fish and Wildlife Department (ODFW) would complement OHA efforts to ensure that fish, game, meat, dairy products, and crops intended for human consumption are not contaminated above acceptable limits.
- In instances where those limits are exceeded, these agencies will help ensure the public is informed and contaminated products are properly disposed of.

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- Serve as the lead and advise on county animal evacuation plans, including transportation, shelter and care of domestic animals.
- ODA's Procedures for Radiological Emergencies, dated April 2010 are included in DOE's CGS/Hanford Emergency Response Plan.
- ODA has Milk sampling capabilities and personnel equipped with PPE to assist the OHA in sampling agricultural products in potentially affected areas
- Can provide personnel to supervise Food Control Check Point(s) for a minimum of 72 hours.
- Assets available in a response:
  - Thirty-six Food Safety Specialists
  - Four personnel trained and equipped to support OHA Radiation Sampling Team(s)
  - Three veterinarians
  - Five Brand Inspectors
  - Five Water Quality Inspectors
  - Six Livestock Water Quality Specialists

**4.2.3 Oregon Department of Fish and Wildlife (ODFW)**

- In situations where food supply contamination may be of concern, Oregon Department of Agriculture (ODA) and the Oregon Department of Fish and Wildlife Department (ODFW) would complement OHA efforts to ensure that fish, game, meat, dairy products, and crops intended for human consumption are not contaminated above acceptable limits.
- In instances where those limits are exceeded, these agencies will help ensure the public is informed and contaminated products are properly disposed of.

**4.2.4 Oregon State Fire Marshal (OSFM)**

- Establish and maintain the statewide Hazardous Materials Emergency Response system, which includes regionally located response teams with specialized training and equipment.
- OSFM has at their disposal: 13 State hazmat Teams, 3 Type II Incident Management Teams, and the ability to mobilize any fire department in the state, including specialty teams to assist under the conflagration act. If the event involved structural collapse, an urban search and rescue task force could be assigned.

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- When requested through OERS, hazmat response teams can respond to serious incidents involving radiological materials when the incident exceeds first responder training and equipment.
- In an event a State hazmat team would likely be one of the first responders on scene. At the point that it exceeds their capability the Conflagration Act would be called in to manage and activate state fire resources and Incident Management Teams. At that point OSFM would unify and work with lead agencies for monitoring and response issues.
- All hazmat teams are trained in monitoring and plume models for radiation. Radiation Safety Officers (RSOs) can provide information and response throughout Oregon.

**4.2.5 Oregon Military Department (OMD)****4.2.5.1 Oregon Office of Emergency Management**

- Coordinates state agency communication and response through OERS and the ECC.
- Coordinates state agency support to the Recovery Committee.

**4.2.5.2 Oregon National Guard**

- Oregon National Guard support requires formal request through the State ECC and approval by The Adjutant General.
- In peacetime, the Guard is under the command of the Governor with its active command and administration vested in the Adjutant General. When directed by the Governor through a declaration of a “State of Emergency”, the Guard may be placed in state “active duty status”, with the state bearing financial responsibility for the committed forces to include wages, fuel, equipment maintenance, and other expenses.
- The Oregon Military Department (OMD) relies on the Oregon National Guard Joint Emergency Operations Plan or as directed by The Adjutant General of Oregon for response to any radiological / nuclear incident.
- Area Commanders may render immediate aid to save lives and protect property under circumstances outlined in National Guard Regulation (NGR) 500-1, Military Support to Civil Authorities.
- Other than the 102 Civil Support Team (CST), Oregon National Guard participation in assistance during a Chemical, Biological Radiological, Nuclear and Explosive (CBRNE) event is as a direct supporting agency (security, logistics support, advisory, etc.).

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- “Just in time training” may be accomplished by qualified trainers of responding state or federal agencies, meeting OSHA standards, to qualify Oregon Guardsman.
- Until/unless trained and equipped for the role with proper Personal Protective Equipment for the event, Oregon Guardsman will not be employed within a known “hot/warm” zone, or in a decontamination process.
- “Just in time training” and needed PPE equipment will be provided by request through the State ECC.
- Guard units are trained and equipped to support law enforcement, medical care, traffic control, firefighting support, resource distribution, potable water transportation, assist primary agencies in establishment of Community Points of Distribution (C-PODs) establishing communications networks with fixed and mobile radios, providing aerial surveillance of a disaster area, and the provision of limited electric power from portable generators.
- The National Guard may also support search and rescue, and can provide lifesaving and air ambulance missions. Resources include: ground transportation capabilities, limited rotary wing air transportation assets, internal medical support and limited water purification.
- The OMD has the capability of immediately deploying the 102 CST to support civil authorities at domestic (CBRNE) incident sites. The 102 CST is capable of identifying CBRNE agents and substances, assessing current and projected consequences, advising on response measures, and assisting with appropriate requests for additional support. This includes incidents involving the intentional or unintentional release of CBRNE and natural or man-made disasters that result or could result in the catastrophic loss of life or property in the United States.
- The 102 CST is composed of full-time Army and Air National Guard personnel that are divided into six sections: command, operations, communications, administration/logistics, medical/analytical, and survey. Each team member is hazmat Tech certified and has more than 600 hours of training in CBRNE environments. 102 CST personnel can provide triage and decontamination recommendations. Assigned to the Team is a fully trained and certified Nuclear Medical Science Officer.
- The 102 CST operates high tech equipment including a specialized/secure communications vehicle (Unified Command Suite), and a mobile analytical laboratory system with a full suite of chemical, biological, and radiological analysis equipment. These items include:

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Gamma Spectrum Analysis Software, Plume Modeling, and ability to detect Alpha, Beta, Gamma, and Neutrons within a specific location.

Additional radiological monitoring assets include mounted and dismounted radiological detection equipment, limited individual dosimeter capabilities, limited decontamination assets and mobile meteorological units.

- The Oregon National Guard does not maintain an in State stockpile of radiological Personal Protective Equipment and medical supplies. Furthermore, for State missions on State Active Duty, accreditation, and privileging for Oregon National Guard medical personnel is required to treat civilians (ORS 401.654, 401.664) unless waived by a Governor decree or Oregon State Law is changed.

In a CBRNE event the Oregon National Guard can also call on regional assets such as the Washington National Guard's Chemical, Biological, Radiological/Nuclear, and Explosive (CBRNE) - Enhanced Response Force Package (CERF-P). The CERF-P is composed of four elements staffed by personnel from already established National Guard units. The elements are search and extraction, decontamination, medical, and command and control.

**4.2.6 Oregon Occupational Safety and Health Division (OR-OSHA)**

- Undertaking site-specific occupational safety and health plan development and implementation, and ensuring that plans are coordinated and consistent among multiple sites, as appropriate.
- Identifying and assessing health and safety hazards and characterizing the incident environment, to include continued monitoring of incident safety.
- Carrying out responder personal exposure monitoring, including task specific exposure monitoring.
- Assessing responder safety and health resource needs and identifying sources for those assets.
- Developing, implementing, and monitoring an incident personal protective equipment (PPE) program, including the selection, use, and decontamination of PPE.
- Coordinates communication with labor unions, contractors, and other organizations regarding responder safety and health issues.
- Can coordinate and provide incident-specific responder training.

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- Work in coordination with DOL/OSHA and their partners, in carrying out functions of the National Response Framework, Workers Safety and Health Annex.
- OR-OSHA has one Geiger counter, and 5 radiation dosimeters for workplace exposure monitoring. OR-OSHA staff is trained on equipment, but are not an emergency response team(s), available radiation monitoring equipment is hand held, or clip on.
- OR-OSHA has a MOU with Federal OSHA, who provide radiation experts as needed and available.
- In addition to radiation equipment, OR-OSHA has a large inventory of sampling equipment for a variety of substances and hazards, and staff trained on their use. Using an all hazards approach, it is important to consider hazards other than radiation during mitigation of contamination or debris management. Other hazards to consider would include those of heavy equipment, fall hazards, trenching and shoring, noise, silica, asbestos, etc.

**4.2.7 Oregon Department of Environmental Quality (DEQ)**

- DEQ's regulatory roles, responsibilities and expertise generally relate to non-radiological incidents, i.e., releases of oil and hazardous materials that are hazardous not by reason of radioactivity.
- Provides general expertise on environmental effects of releases of hazardous materials and environmental pollution control techniques.
- Provides general investigative support and expertise on environmental and public health issues related to oil and hazardous material incidents.
- For materials contaminated by radiological releases requiring clean up, DEQ typically would not be directly involved in removal or remediation. DEQ is available to assist and coordinate cleanup actions with ODOE, Public Health, and the U.S. Environmental Protection Agency pursuant to their responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- DEQ also develops comprehensive plans and programs for air and water pollution control and solid and hazardous waste disposal.
- Coordinate with special teams (OSFM hazmat Teams, ODOT Incident Response Teams, USCG, EPA, local emergency responders and others).
- DEQ can provide:
  - Debris management expertise, including technical expertise in management of solid and hazardous wastes.

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- Air monitoring and air modeling expertise, although the core of DEQ expertise and experience is with monitoring and modeling of non-radioactive materials.
  - Oregon DEQ provides technical assistance and infrastructural funding (grants and loans) for community water system providers (Oregon Public Health is the lead agency for drinking water standards).
  - Expertise in communications about risks to the public and measures the public can take to address potential concerns.
  - Assistance with mapping/GIS capability and assistance in developing and maintaining data for situational awareness.
- DEQ develops and implements programs for air and water pollution control and solid and hazardous waste disposal.

## **5 Concept of Operations**

### **5.1 Communications**

#### **Public Communications Procedures:**

OHA will ensure the following public communication procedures

- Respond to media requests.
- Provide accurate and timely information to other agencies and government PIOs.
- Conduct media availability/press briefings as needed.
- Establish and maintain Radiation Information toll free number during business hours.
- Develop online question and response capability for the public to submit questions and receive timely responses (within 24 hours).
- Disseminate Frequently Asked Questions once developed and approved. Translate into top 5 languages in Oregon and disseminate links. Do not distribute documents via attachments. Disseminate links only.
- Maintain accurate, timely information on established web pages to ensure most accurate information over time.
- Address/interrupt rumors and misinformation as quickly as possible.

### **5.2 Procedural Overviews Based On Type of Incident**

#### **5.2.1 Transportation Accidents**

- With Oregon being a major west coast transportation corridor, there is a potential for incidents which may cause a release of radioactive materials. This could happen any time and could require state and

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local agencies to implement actions to protect health and safety of the populace.

- All agencies, state or local, receiving information of an accident involving radioactive material must notify the Oregon Emergency Response System (OERS) to notify agencies for appropriate response as indicated by this annex and the Oregon Radiological Emergency Response Plan.
- Oregon Department of Energy receives advance notification of transportation of certain shipments of nuclear waste and spent fuel through the state (ORS 469).

**5.2.2 Transoceanic/International Radiologic Event (Includes adjacent US States)**

- Upon notification of a potential transoceanic/international radiologic event, OHA (ODOE if Hanford) will immediately notify OEM of the situation to begin State response coordination.
- OHA is responsible for monitoring the radiological health impact of transoceanic/international radiologic events affecting the State.
- Should radiation should increase to dangerous levels or is likely to do so as a consequence of foreign nuclear detonations or accidents, OHA and OEM will immediately notify listed support agencies in this annex to conduct assigned responsibilities.
- OHA will coordinate response and the implementation of countermeasures as deemed necessary.

**5.2.3 Incidents at Nuclear Facilities**

- ODOE is the lead state agency on nuclear emergency preparedness, response, and recovery at incidents involving fixed nuclear facilities, Independent Spent Fuel Storage Installations (ISFSI), Research Reactors. ODOE developed and maintains the Oregon CGS/Hanford Emergency Response Plan, Trojan ISFSI Plan, and the Radioactive Materials Transportation Plan. These plans define the State's role and responsibilities to prepare for, respond to, and recover from in-State and nearby nuclear facility radiological emergencies. ODOE also reviews Oregon State University and Reed College Research Reactor Emergency Response Plans.
- Coping with a radiation emergency involving a nuclear facility is a joint, cooperative effort of the facility operator, and local, state, and federal governments. This response is described in detail in the Nuclear Facilities Incident Response Plans identified above.

**IA 9. Nuclear/Radiological****5.2.4 Deliberate Attacks Involving Nuclear/Radiological Facilities or Materials, Including RDDs, REDs, or INDs**

- The most common nuclear/radiological incidents involve loss, theft, or mismanagement of relatively small radioactive material sources, or technologically enhanced, naturally occurring radioactive material, where some exposure of individuals or dispersal into the environment occurs.
- Radiological terrorism, involving but not limited to Radiological Dispersal Device (RDD), Radiological Exposure Device (RED), and an Improvised Nuclear Device (IND) poses a threat to human life and property.
- During the initial response, state agencies with technical expertise, specialized equipment, and personnel will support local response agencies. Federal agencies responsible for the investigation may also request state assets.
- The FBI is the lead federal agency responsible for all criminal investigations of terrorist acts or terrorist threats. The FBI is responsible for coordinating activities at the scene and activities to detect, prevent, preempt, investigate, and disrupt terrorist attacks against the U.S., including incidents involving nuclear/radioactive materials (e.g., RDD/RED/IND incidents). State support to the FBI and other federal law enforcement agencies will be coordinated by the Oregon State Police (OSP) through ESF #13—Public Safety and Security.
- For radiological terrorism incidents involving materials or facilities licensed by the Nuclear Regulatory Commission (NRC) within Oregon, the NRC is the federal coordinating agency for consequence management with Oregon Department of Energy provide state support and contact with the State ECC.
- The OHA and ODOE will provide health and technical support to law enforcement and the local Incident Commander upon request.
- OERS and OEM will notify the governor, OHAs Radiation Protection Services, and other appropriate State and federal agencies; and activate the State ECC, if necessary.
- A Unified Command including federal and responsible State agencies will be established in the event of a terrorist attack.

**5.2.5 Nuclear Device/Weapon Detonation**

- The state could suffer catastrophic damage to life, property and infrastructure as the result of the accidental or intentional detonation of a nuclear device(s)/weapon(s) in the U.S.

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- During increased threat periods, the Oregon Military Department and Oregon Emergency Management will coordinate with the DOD and U.S. DHS to provide information and resources to local government and the public.
- Electromagnetic pulse could disrupt and/or destroy wired and wireless communications as a result of an attack on Oregon or the United States.

**5.3 ECC and State Agency AOC Operations:**

The Emergency Coordination Center (ECC) is the single point of contact for an integrated state response. The purpose of the ECC is to provide a centralized location where state officials may coordinate activities and implement direction from the Governor. The primary responsibility of the ECC is to provide information, policy direction, and resource coordination in response to a major emergency or disaster.

The Agency Operations Center (AOC) is the physical location for agency staff to coordinate activities. The AOC is activated for large scale radiation emergencies.

**AOC Activities in Radiological Response:**

- Notify, assemble and dispatch emergency response teams
- Coordinate field team activities
- Coordinate laboratory testing of environmental and human samples
- Acquire resources to support local health department field emergency responses through the state ECC. All resource requests are forwarded to and filled by the Logistics Section. These include:
  - Personnel and equipment
  - Hazmat teams (once activated, these teams become a state resource)
  - Selected personnel from state universities acting on regional radiological field teams
    - OSU Radiation Center
    - Oregon 102nd National Guard Civil Support Team
  - Coordinate health information flow to and from:
    - Federal agencies
    - OHA programs and other state agencies
    - Local health departments
    - Tribal governments
    - Health care organizations

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- Providers of medical care, medical facilities, and medical suppliers
- The Joint Information System/Joint Information Center (JIS/JIC)

**5.4 Response and Recovery:****5.4.1 Alert and Notification**

OEM will notify the governor of emergency conditions that may require state assistance. OEM will notify and coordinate the response of local, state, and federal agencies, volunteer agencies, and affected industry.

The Emergency Alert System (EAS) and Reverse 911 where available will be utilized to notify the public in order to rapidly inform the public of an event and by giving them information on actions that should be taken.

**5.4.2 Response Phase**

The Response Phase occurs from the onset of a nuclear/radiological incident and lasts until the situation is stabilized. During this phase, functions which are critical to lifesaving, protection of property, evacuations and sheltering considerations according to local response plans, meeting basic human survival needs, securing critical infrastructure and evacuated areas, and protecting the environment are performed.

**5.4.3 Recovery Phase**

There are usually no clear distinctions between when the Response Phase ends and the Recovery Phase begins. There is typically a time period after the initial incident in which both phases are in effect simultaneously. The Recovery Phase begins a few days after the incident and can last as long as several years. During this phase, the federal government can provide disaster relief upon a presidential disaster declaration. Functions during this phase include the Stafford Act for Public Assistance (PA) and Individual Assistance (IA), establishment of disaster assistance centers, establishment of temporary housing facilities, and federal disaster loans and grants. Long-term recovery includes restoration of affected areas to their normal or improved state.

Private nuclear facility owners/operators have primary responsibility for recovery planning activities and eventual cleanup within their facility boundaries and may have responsibilities for recovery activities outside the facility under applicable legal obligations (e.g. contractual, licensee, CERCLA).

OHA will provide technical support and make recommendations regarding the radiological and health aspects of recovery activities to Recovery Committee. When restoration actions exceed the capacity of OHA, federal assistance will be requested.

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The four phases of recovery are re-entry, restoration, return, and relocation. The phases may occur concurrently. Within a specific phase, action items may be undertaken simultaneously or otherwise modified to meet the situation. Routes of exposure during all phases can be external (ground deposition) and internal (inhalation of re-suspended particles).

Recovery Phase	Definition
Re-entry	<ul style="list-style-type: none"> <li>• A contamination survey is performed.</li> <li>• The results form the basis for protective actions or the release of designated areas to unrestricted use.</li> </ul>
Restoration	<ul style="list-style-type: none"> <li>• Begin reducing exposure rates and concentrations to acceptable levels.</li> <li>• This phase can last from months to years.</li> </ul>
Return	<ul style="list-style-type: none"> <li>• Individuals are permitted to reoccupy their homes upon verification and workplaces.</li> <li>• This phase may occur from several days to years after the incident.</li> </ul>
Relocation	<ul style="list-style-type: none"> <li>• Individuals are relocated when the affected areas cannot be restored for unrestricted use.</li> <li>• Decisions on whether to restore or relocate are based on both technological and economic considerations.</li> <li>• People are excluded for an indefinite period from the affected areas to avoid chronic radiation exposures in excess of established limits.</li> <li>• This phase can last from several months to several years.</li> </ul>

## 6 Supporting Plans

- Public Health Radiological Emergency Response Plan, Oregon Health Authority
- ESF #10 and ESF #12 of the State of Oregon Emergency Response Plan (Other ESF annexes of State of Oregon EOP as dependent on the situation).

## 7 Appendices

### Appendix A Federal Resources

- The FBI is the lead federal agency for a radiological terrorist incident.
- The U.S. DOE provides federal radiological support with both equipment and personnel when called by the FBI for a terrorist incident or upon request from the state for a radiological accident
- The NRC provides technical assistance and ensures compliance with the legal use of radiological material for any incident involving a radiological licensee or a nuclear power plant.
- The EPA provides technical assistance during the recovery phase of a radiological disaster. The EPA responds when called by the FBI for a

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terrorist incident or upon request from the state for a radiological accident that affects a large area, waterways or federal land.

- The CDC is the lead consulting agency in the collection of human clinical samples to test for heavy metal and/or chemical exposure.
- A federal representative, from FEMA, the EPA, or the U.S. DOE, will be on the Recovery Committee.
- In large scale incidents, a Federal Radiological Monitoring Assessment Center (FRMAC) will be established.

Other federal agencies that have a support role in the response to or recovery from a radiological incident are outlined in the U.S. Department of Homeland Security *National Response Plan*. (See <http://www.epa.gov/radiation/rert/nuclearannex.htm>)

**Appendix B Federal Assets****Federal Radiological Monitoring and Assessment Center (FRMAC)**

The FRMAC is responsible for coordinating all environmental radiological monitoring, sampling, and assessment activities for the response. The FRMAC is a DOE-led interagency asset that is available on request to respond to nuclear/radiological incidents. DOE leads the FRMAC for the initial response, then transitions FRMAC leadership to EPA for site cleanup. The FRMAC is established at or near the incident location in coordination with DHS, the coordinating agency, other federal agencies, and state, tribal, and local authorities.

A FRMAC normally includes representation from DOE, EPA, the U.S. Department of Commerce, the DHS National Communications System, the US Army Corps of Engineers (USACE), and other federal agencies as needed. Regardless of who is designated as the coordinating agency, when the FRMAC is activated, DOE, through the FRMAC or DOE Consequence Management Home Team (CMHT), coordinates all federal environmental and agricultural radiological monitoring and assessment activities for the initial phases of the response. When the FRMAC is transferred to EPA, EPA assumes responsibility for coordination of radiological monitoring and assessment activities.

Some participating federal agencies have radiological planning and emergency responsibilities as part of their statutory authority. The monitoring and assessment activity coordinated by the FRMAC does not alter these responsibilities but complements them by providing for coordination of the federal radiological monitoring and assessment response activities.

**DOE Aerial Measuring System (AMS)**

The DOE AMS characterizes ground-deposited radiation from aerial platforms. These platforms include fixed-wing and rotary-wing aircraft with radiological measuring equipment, computer analysis of aerial measurements, and

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equipment to locate lost radioactive sources, conduct aerial surveys, or map large areas of contamination.

**DOE Accident Response Group (ARG)**

The DOE ARG response element comprises of scientists, technical specialists, crisis managers, and equipment ready to respond to the scene of a U.S. nuclear weapon accident to make the weapon safe for shipment.

**DOE National Atmospheric Release Advisory Center (NARAC)**

The DOE NARAC provides a computer-based emergency preparedness and response predictive modeling capability. The NARAC is an off-site resource that supports the incident response remotely. NARAC provides real-time computer predictions of the atmospheric transport of material from radioactive releases and of the downwind effects on health and safety. When measurement data become available, they are used to improve model predictions.

**DOE Radiation Emergency Assistance Center/Training Site (REAC/TS)**

The DOE REAC/TS provides medical advice, specialized training, and on-site assistance for the treatment of all types of radiation exposure accidents. Additionally, through the Cytogenetic Biodosimetry Laboratory (CBL), REAC/TS provides for post exposure evaluation of radiation dose received.

**DOE Radiological Assistance Program (RAP) Team**

DOE RAP teams are located at various DOE Operations Offices, Site Offices, and National Laboratories. They can be dispatched to a radiological incident from Regional DOE Offices in response to a radiological incident. RAP teams provide first-responder radiological assistance to protect the health and safety of the general public, responders, and the environment and to assist in the detection, identification and analysis, and response to events involving radiological/nuclear material. Deployed RAP teams provide traditional field monitoring and assessment support as well as a search capability.

**Nuclear Incident Response Team (NIRT)**

The NIRT consists of (1) the DOE resources described above and (2) EPA entities that perform such support functions (including radiological emergency response functions) and related functions. Under the Homeland Security Act of 2002, DHS has the authority to activate NIRT assets. When activated, the NIRT operates under DHS direction, authority, and control. When not operating as part of the NIRT, these assets remain under the control of the parent agency.

**The Interagency Modeling and Atmospheric Assessment Center (IMAAC)**

The IMAAC is an interagency center responsible for production, coordination, and dissemination of the federal consequence predictions for an airborne hazardous material release. Through a partnership of the DHS, DOE, DOD, and Commerce (through the National Oceanic and Atmospheric Administration [NOAA]), EPA, NASA, and NRC, the IMAAC provides the single federal

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atmospheric prediction of hazmat concentration to all levels of the Incident Command. The IMAAC is an off-site resource that supports the incident response remotely. The NARAC is the interim IMAAC.

**Advisory Team for Environment, Food, and Health**

The Advisory Team includes representatives from EPA, the USDA, the Food and Drug Administration (FDA), the CDC, and other federal agencies. The Advisory Team develops coordinated advice and recommendations on environmental, food, health, and animal health matters for the Incident Command, DHS, the Joint Field Office (JFO), Unified Coordination Group, the coordinating agency, and/or state, tribal, and local governments as appropriate. The Advisory Team uses information provided by the IMAAC, FRMAC, and other relevant sources. The Advisory Team provides federal advice in matters related to the following:

- a) Environmental assessments (field monitoring) required for developing recommendations with advice from state, tribal, and local governments and/or the FRMAC;
- b) Protective Action Guides (PAGs) and their application to the emergency;
- c) Protective Action Recommendations (PARs) using data and assessment from the FRMAC;
- d) Protective actions to prevent or minimize contamination of milk, food, and water, and to prevent or minimize exposure through ingestion;
- e) Recommendations for minimizing losses of agricultural resources from radiation effects;
- f) Availability of food, animal feed, and water supply inspection programs to ensure wholesomeness;
- g) Relocation, reentry, and other radiation protection measures prior to recovery;
- h) Recommendations for recovery, return, and cleanup issues;
- i) Health and safety advice or information for the public and for estimated effects of radioactive releases on human health and the environment; and
- j) Other matters, as requested by the IC or coordinating agency.

**EPA Radiological Emergency Response Team (RERT)**

The EPA RERT provides resources, including personnel, specialized equipment, technical expertise, and laboratory services to aid coordinating and cooperating agencies and state, tribal, and local response organizations in protecting the public and the environment from unnecessary exposure to ionizing radiation from radiological incidents. The RERT is a designated Special Team under the NCP. It may become part of the FRMAC if one is established. The RERT provides the following:

- a) Monitoring, sampling, laboratory analyses, and data assessments using field emergency response assets.
- b) Technical advice and assistance for containment, cleanup, restoration, and recovery following a radiological incident.

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- c) Assistance in the development and implementation of a long-term monitoring plan and long-term recovery plans.
- d) Coordination with fixed laboratory assets for in-depth analysis and evaluation of large numbers of site-specific emergency response samples.

**EPA RadNet**

The EPA RadNet comprises a system of fixed and deployable radiation monitoring stations. The RadNet fixed monitoring stations provide a nationwide environmental monitoring network for assessment of nationwide impacts from a radiological incident. The deployable component can provide site-specific emergency monitoring for further assessment of localized impacts during radiological emergencies.

**Lead Federal Agencies for Nuclear/Radiological Incidents:**

Nuclear/Radiological Facilities or Materials Involved in Incident	Lead Federal Agency
<p><b>Nuclear facilities:</b></p> <ul style="list-style-type: none"> <li>1) Owned or operated by DOD or DOE;</li> <li>2) Licensed by NRC or Agreement State; and</li> <li>3) Not licensed, owned, or operated by a federal agency or an Agreement State, or currently or formerly licensed facilities for which the owner/operator is not financially viable or is otherwise</li> </ul>	<ul style="list-style-type: none"> <li>1) DOD or DOE;</li> <li>2) NRC; and</li> <li>3) EPA.</li> </ul>
<p><b>Radioactive Materials being transported:</b></p> <ul style="list-style-type: none"> <li>1) Materials shipped by or for DOD or DOE;</li> <li>2) Shipment of NRC or Agreement State-licensed materials;</li> <li>3) Shipment of materials in certain areas of the coastal zone that are not licensed or owned by a federal agency or Agreement State; and</li> <li>4) All others.</li> </ul>	<ul style="list-style-type: none"> <li>1) DOD or DOE;</li> <li>2) NRC;</li> <li>3) U.S. DHS/USCG</li> <li>4) EPA.</li> </ul>
<p><b>Radioactive materials in space vehicles impacting within the United States:</b></p> <ul style="list-style-type: none"> <li>1) Managed by National Aeronautics and Space Administration (NASA) or DOD;</li> <li>2) Not managed by DOD or NASA and impacting certain areas of the coastal zone;</li> <li>3) All others</li> </ul>	<ul style="list-style-type: none"> <li>1) NASA or DOD;</li> <li>2) DHS/USCG; and</li> <li>3) EPA.</li> </ul>
<p><b>Foreign, unknown, or unlicensed material</b></p>	<ul style="list-style-type: none"> <li>1) DHS/CBP</li> </ul>

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<p>1) Incidents involving inadvertent import of radioactive materials;                  2) Incidents involving foreign or unknown sources of radioactive material in certain areas of the coastal zone; and                  3) All others</p>	<p>(Customs and Border Protection);                   2) DHS/USCG; and                   3) EPA.</p>
<p><b>Impact from a Foreign, transoceanic, or unknown source</b></p> <p>1. The foreign or unknown source may be a reactor (e.g., Chernobyl or Fukushima), radioactive fallout from atmospheric testing of nuclear devices, imported radioactively contaminated material, or a shipment of foreign-owned radioactive material.</p>	<p>The EPA is the Lead Federal Agency for an emergency involving radioactive material from a foreign or unknown source with actual, potential, or perceived radiological consequences in the United States.</p>
<p><b>Nuclear Weapons</b></p>	<p>DOD or DOE (based on custody at time of incident)</p>
<p><b>All deliberate attacks involving nuclear/radiological facilities or materials, including RDDs or INDs</b></p>	<p>DHS</p>