Communicating During and After a Nuclear Power Plant Incident

June 2013

FEMA

FOREWORD

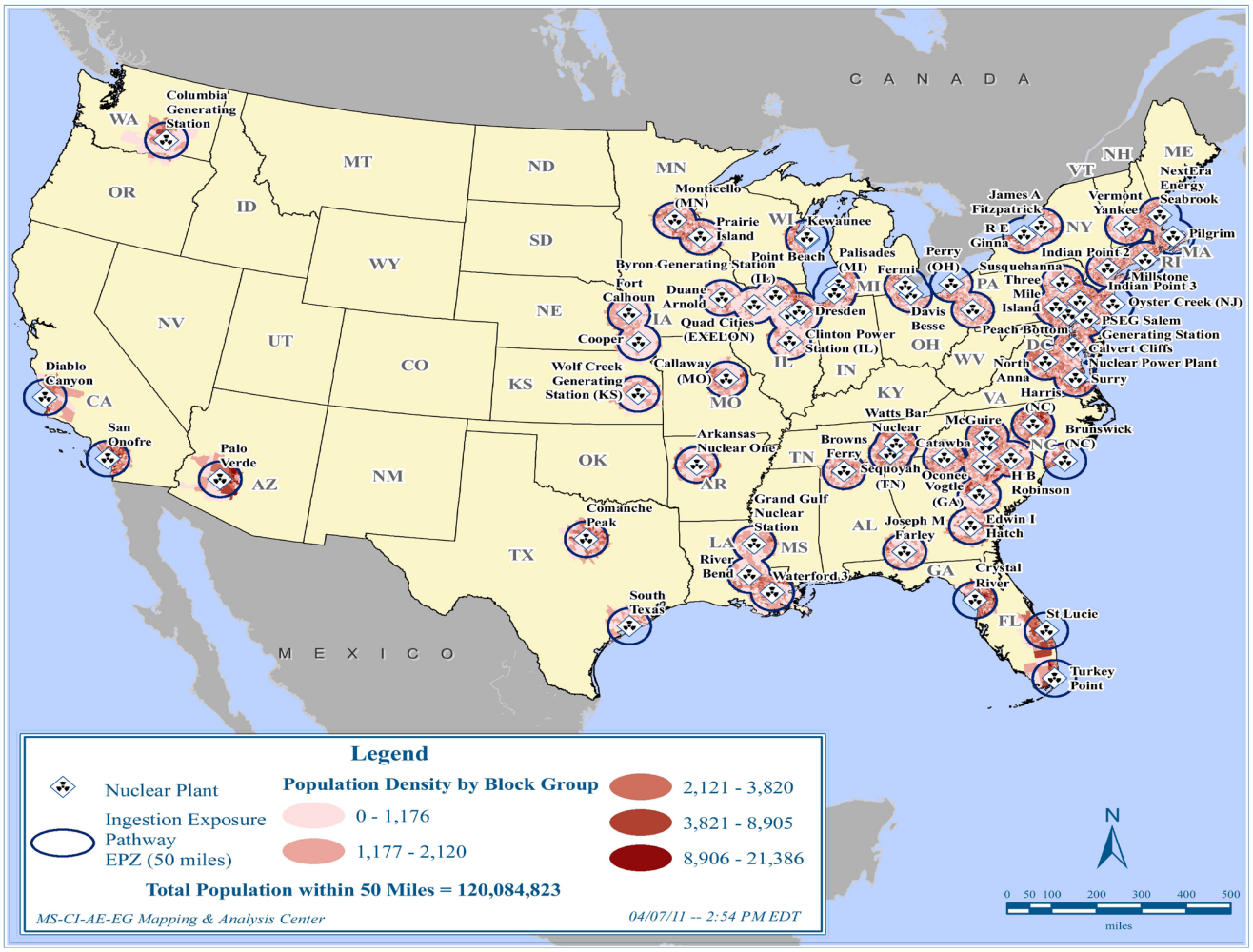
This document provides communications guidance for domestic nuclear power plant (NPP) incidents, including sample text and suggested answers to anticipated public and media questions. This document also provides background information explaining roles and responsibilities across all levels of government during an NPP incident. While primarily created for Federal leaders who will speak to the public, this document should also complement the routinely exercised communication materials used by State, local, and tribal officials.

The Principal Level Exercise 3-10, a cabinet level exercise with a NPP incident as the focus, highlighted the importance of communicating timely and accurate information to people potentially at risk from an NPP incident. Providing information on avoiding radiation, saving lives, protecting property, or calming fears requires the delivery of coordinated, prompt, reliable, and actionable information to the whole community through the use of clear, consistent, accessible, and culturally and linguistically appropriate methods that will increase public understanding and encourage people to take practical steps to protect themselves.

In the United States, Federal, State, local, and tribal officials share responsibility for coordinating and communicating information to the public for a NPP incident. State, local, and tribal authorities possess the primary responsibility for making protective action decisions and communicating health and safety instructions to their affected populations. As laid out in the National Response Framework (NRF), a number of Federal agencies also play an important role in responding as well as communicating and coordinating emergency public information with State, local, and tribal agencies. This guidance document serves as a resource for communicators who provide information to the public, the news media, and other stakeholders during and after a NPP incident.

Public officials, incident managers, and their spokespersons will provide specific and frequent information updates. These updates will cover what has occurred, how to protect people, actions taken to mitigate the incident, what residents can expect in the future, and other details. These communications will often originate from a Joint Information Center (JIC) established near the incident site. National spokespersons will reinforce the actions of local and State decision-makers and build confidence and trust that all levels of government engage in every possible way in order to resolve the situation and protect the public.

A broad interagency group of communication experts, convened under the Federal Radiological Preparedness Coordinating Committee (FRPCC), developed the guidance in this document, with assistance from State and local communicators. The FRPCC will continue to maintain this guidance, which employs effective risk communication strategies based on proven communications principles.



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Plant Name	City, State	# of Operating Units	2007 Population within 50 Miles
Arkansas Nuclear 1	London, AR	2	345,855
Beaver Valley	Shippingport, PA	2	3,311,036
Braidwood Generation Station	Godley, IL	2	5,241,708
Browns Ferry	Hillsboro, AL	3	991,545
Brunswick	Southport, NC	2	463,053
Byron Generating Station	Bryon, IL	2	1,368,970
Callaway	Readsville, MO	1	575,978
Calvert Cliffs	Long Beach, MD	2	3,624,135
Catawba	Tega Cay, SC	2	2,490,684
Clinton	De Witt, IL	1	867,814
Columbia	Hanford, WA	1	450,873
Comanche Peak	Glen Rose, TX	2	1,774,392

Plant Name	City, State	# of Operating Units	2007 Population within 50 Miles
Cooper	Nemaha, NE	1	200,048
Crystal River	Inglis, FL	1	1,137,214
Davis Besse	Oak Harbor, OH	1	1,920,288
Diablo Canyon	Los Osos, CA	2	466,214
Donald C Cook	Bridgman, MI	2	1,328,075
Dresden	Channahon, IL	2	7,668,257
Duane Arnold	Palo, IA	1	683,736
Edwin I Hatch	Johnson Corner, GA	2	484,899
Fermi	Stony Point, MI	1	5,180,077
Fort Calhoun	Blain, NE	1	961,037
Grand Gulf	Grand Gulf, MS	1	383,732
H B Robinson	North Hartsville, SC	1	952,373
Harris	Haywood, NC	1	2,501,145
Hope Creek/Salem	Odessa, DE	3	5,636,661
Indian Point	Buchanan, NY	2	17,667,947
Joseph M Farley	Columbia, AL	2	463,617
Kewaunee	Two Creeks, WI	1	821,195
LaSalle	Seneca, IL	2	2,045,434
Limerick	Linfield, PA	2	8,157,430
McGuire	Lowesville, NC	2	2,772,149
Millstone	Niantic, CT	2	3,140,932
Monticello	Monticello, MN	1	3,120,282
NextEra Energy Seabrook	Hampton, NH	1	4,392,958
Nine Mile Point/James A Fitzpatrick	New Haven, NY	3	954,991
North Anna	Buckner, VA	2	1,975,381
Oconee	Six Mile, SC	3	1,441,565
Oyster Creek	Waretown, NJ	1	4,6212,075
Palisades	Covert, MI	1	1,440,338
Palo Verde	Wintersburg, AZ	3	2,082,818
Peach Bottom	Delta, PA	2	5,692,218
Perry	North Perry, OH	1	2,455,964
Pilgrim	White Horse Beach, MA	1	4,854,448
Point Beach	Two Creeks, WI	2	817,005
Prairie Island	Diamond Bluff, WI	2	3,092,410
Quad Cities (EXELON)	Folletts, IA	2	703,283
R E Ginna	Williamson, NY	1	1,319,187
River Bend	Saint Francisville, LA	1	985,144

Plant Name	City, State	# of Operating Units	2007 Population within 50 Miles
San Onofre	San Clemente, CA	2	8,736,539
Sequoyah	Lakesite, TN	2	1,151,265
South Texas	Buckeye, TX	2	293,974
St Lucie	Ankona, FL	2	1,339,928
Surry	Jamestown, VA	2	2,372,415
Susquehanna	Mocanaqua, PA	2	1,871,564
Three Mile Island	Goldsboro, PA	1	2,890,650
Turkey Point	Islandia, FL	2	3,530,182
V C Summer	Monticello, SC	1	1,229,017
Vermont Yankee	Hinsdale, NH	1	1,679,530
Vogtle	Girard, GA	2	779,627
Waterford 3	Norco, LA	1	1,929,147
Watts Bar	Decatur, TN	1	1,235,308
Wolf Creek	Sharpe, KS	2	212,730

CONTENTS

A. Response Guidance for Nuclear Power Plant Incidents

Several key guidance documents outline the roles and responsibilities of the Federal government in responding to an NPP incident that require a coordinated Federal response. This section briefly summarizes those documents as they specifically relate to communicating with the public during and after an NPP incident.

National Response Framework

The National Response Framework (NRF) presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies of all kinds – from the smallest incident to the largest catastrophe. In the event of an incident at an NPP, additional documents within the NRF offer further guidance and information for communicators as discussed below.

NRF: Nuclear/Radiological Incident Annex

The Nuclear/Radiological Incident Annex (NRIA) of the NRF describes the policies, concepts of operations, and responsibilities of the Federal departments and agencies for incidents involving the release of radioactive materials. These incidents may occur on federally-owned or licensed facilities, privately owned property, urban centers, or other areas and may vary in severity from the small to the catastrophic. The incidents may result from inadvertent or deliberate acts. The NRIA applies to incidents where the nature and scope of the incident requires a Federal response to supplement the State, local or tribal incident response.

State, local, and tribal governments retain primary responsibility for deciding on and implementing protective measures and notifying the public. The Federal Government will coordinate its response to a nuclear/radiological incident internally as well as with the State, local, and tribal governments having jurisdiction over the area affected by the incident. An incident involving the potential release of radioactivity may require implementation of protective measures, such as evacuation and shelter-in-place.

DHS is the coordinating agency for the overall Federal Government response for radiological incidents in accordance with Homeland Security Presidential Directive (HSPD) 5 and the NRF. For radiological incidents of a lesser severity (those incidents that do not reach the level of an incident requiring a coordinated Federal response), the agency with jurisdictional authority will serve as the coordinating agency for the Federal response.

As described in the NRIA, the Nuclear Regulatory Commission (NRC) is the coordinating agency for incidents occurring at NRC-licensed facilities and for radioactive materials either licensed by NRC or under NRC's Agreement States Program. As coordinating agency, NRC has technical leadership for the Federal Government's response to the incident. If the severity of an incident rises to the level of General Emergency (the highest of the NRC incident severity categories), or is terrorist-related, the Department of Homeland Security (DHS) would assume coordination of the overall Federal response to the incident, while the NRC would retain a technical leadership role.

After the NPP provides a protective action recommendation (PAR), the State, local, and tribal governments are responsible for making protective action decisions (PADs) and communicating the protective actions to the public as they deem appropriate. DHS and the Agency with jurisdictional authority provide support by developing and delivering Federal

advice to State, tribal, and local governments (*not* directly to the public). The Federal guidance may include assistance on measures to avoid or reduce unnecessary radiation exposure to the public, such as sheltering in place, evacuation, and use of potassium iodide (KI). It also includes assistance on long-term measures to avoid or minimize exposure, such as restrictions on food, temporary relocation, or permanent resettlement.

NRF: Emergency Support Functions (ESF) #15 – External Affairs

ESF Annexes describe the Federal coordination structures that group resources and capabilities into functional areas that are most frequently needed in a national response. ESF #15 (External Affairs) ensures assignment of sufficient external resources in order to provide accurate, coordinated, and timely information to affected audiences, including governments, media, the private sector and local populations to include people with disabilities and people with limited English proficiency. It applies to all Federal departments and agencies that may require incident communications and external affairs support or whose external affairs assets may be employed during incidents requiring a coordinated Federal response.

In accordance with the NRF, Federal departments and agencies use established protocols identified for use during an incident requiring a coordinated response:

- **The DHS National Joint Information Center (NJIC)**
  NJIC serves as the Federal incident communications coordination center during incidents requiring a coordinated Federal response. The NJIC is expected to coordinate with State and local Joint Information Centers (JICs).
- **National Incident Communications Conference Line (NICCL)**
  DHS Public Affairs uses the NICCL to facilitate the transmission and exchange of critical and timely *incident* information among Federal and affected State, local, and tribal authorities. During sustained incident management activity, DHS Public Affairs will use the NICCL for daily or other incident communications coordination calls.
- **State Incident Communications Coordination Line (SICCL)**
  The SICCL is a similar dedicated Federal-State incident communications conference line managed by DHS Public Affairs. This standing communications resource can facilitate and ensure the inclusion, transmission, and exchange of incident management information, evacuee coordination, and messaging relating to all States and territories.
- **Private Sector Incident Communications Coordination Line (PICCL)**
  The PICCL is a standing line that DHS Public Affairs uses to provide timely public information to the Critical Infrastructure/Key Resources (CI/KR) sectors and their affiliated entities during an incident requiring Federal coordination and response.

Annex N to ESF #15 External Affairs Standard Operating Procedure (SOP)

Annex N focuses specifically on radiological incidents. The annex details radiological incident communications strategies, actions, and coordination in conjunction with a domestic radiological accident or an act of terrorism in order to ensure coordination and execution of a unified public outreach effort.

State, Local, and Tribal Plans and Procedures

Each State, tribe, and locality with an NPP has plans and procedures for responding to a wide variety of potential hazards relating to an NPP incident. Generally, these plans describe how the jurisdiction will protect people and property; detail responsibilities for carrying out specific actions; identify available personnel, equipment, facilities, supplies, and other resources; and specify how coordination of all actions will occur. Typically, a JIC—established at a fixed

location near the incident site—serves as the central source for information coordination between the licensee and offsite response organizations, as well as for information dissemination to the public and the media. Critically, national spokespersons must synchronize their public communications with counterparts at all levels of government to ensure consistency of messaging with the current situation, plans, and procedures.

B. NUCLEAR POWER PLANT INFORMATION

This material provides basic information about NPPs, their safety, and related emergency preparedness topics as background. Consult the References and Resources section to locate sources for more detailed information.

NPP Basics

The NRC currently licenses 104 commercial nuclear power reactors at 65 locations within the U.S. All became operational between 1969 and 1997. In total, they supply approximately 20% of the electric power produced in the country.

Safety

The mission of the NRC is to protect the health and safety of the public and the environment by regulating the design, siting, construction, and operation of commercial nuclear power facilities, as well as non-commercial facilities such as those used for research. The NRC ensures that users of radioactive materials, including NPPs, keep radiation exposures within its specified dose limits and as low as reasonably achievable. In addition, users must obtain a license from the NRC (operators of NPPs are designated "licensees") and undergo periodic inspection to ensure compliance with its regulations and safe use of radioactive materials.

Emergency preparedness

On-site: The NRC requires its licensees to have and maintain plans and procedures for responding to any possible emergency. Four emergency classification levels (ECL) exist to specify types of incidents and responses (in increasing order of severity):

- *Notification of Unusual Event*: Events that indicate potential degradation in the level of safety of the plant are in progress or have occurred. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.

- *Alert*: If an alert is declared, events are in process or have occurred that involve an actual or potentially substantial decline in the level of plant safety. However, any release of radioactive material is expected to be only a small fraction of the Environmental Protection Agency (EPA) protective action guidelines.

- *Site Area Emergency*: Events are in process or have occurred that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the EPA protective action guides (PAGs) except near the site boundary.

- *General Emergency*: A general emergency involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area.

As of the creation of this guidance document, the only incident equivalent to a General Emergency (the above ECL were not in place at the time) in the U.S. involving a leak of radioactive materials occurred at the Three Mile Island plant in Pennsylvania in March 1979. That incident led to the establishment of the Radiological Emergency Preparedness (REP) Program, which is overseen by the Federal Emergency Management Agency (FEMA). The most serious incident in the history of nuclear plants occurred in April 1986 at the Chernobyl Nuclear Power Plant in Ukraine (then part of the Soviet Union), in which an explosion and fire

released large quantities of radioactive contamination into the atmosphere. The Fukushima Daiichi incident in Japan in March 2011, following an earthquake and tsunami, released substantial radioactive material and remains under investigation.

In addition, five Site Area Emergencies with no release of radioactive materials have been declared at U.S. commercial NPPs, and four at non-commercial reactors.

Offsite: Plant operators work closely with offsite response organizations (OROs) to ensure protection of the public in the event of an incident or accident. OROs may include local (municipal and county), tribal, and State emergency agencies and nongovernmental organizations (e.g., American Red Cross). The NRC requires up-to-date ORO plans and procedures as a condition of operating licenses. FEMA partners with the NRC to evaluate ORO plans and procedures, which cover such areas as roles and responsibilities, notifications (including from the plant to the OROs and OROs to the public), communications, protective actions (e.g., shelter-in-place, evacuation, and use of radiation countermeasures), decontamination, mass care, radiation protection, population monitoring, and public information.

Protective Actions: In the event of an emergency at an NPP, the operator must quickly assess the nature and severity of the event and notify offsite organizations, including providing protective action recommendations (PARs), usually based on a set of predictive models. The OROs review the PARs and authorized decision makers (varied by jurisdiction) can accept them intact or revise them to make protective action decisions (PADs) which, in turn, are communicated to the public through the emergency alert system, tone-alert radios, the media, and other means (to include culturally and linguistically appropriate methods). Depending on the situation, protective actions may include (and will vary by location):

- Evacuation: People move to a safe distance away from the source.
- Shelter-in-Place: People stay indoors with windows closed and ventilation turned off until the plume passes.
- Take potassium iodide (KI) to protect the thyroid gland against absorbing radioactive iodine.
- Provide protection to the whole community, including children, the aged, people with disabilities, others with access and functional needs, those in hospitals and other facilities, racially and ethnically diverse communities, and people with limited English proficiency.

Find more information about the Environmental Protection Agency's (EPA) protective action guides (PAGs) at: http://www.epa.gov/radiation/rert/pags.html.

Emergency planning zones (EPZs): Two zones exist around each nuclear power plant with specified protective actions applied: a 10-mile plume exposure EPZ for immediate population protection, and a 50-mile ingestion exposure pathway EPZ to avoid or reduce ingestion of radioactive materials, primarily from consuming food and water derived from pathway sources.

Exercises: Each NPP conducts a graded emergency exercise every two years with the full participation of the licensee and appropriate State, local, and tribal governments, which FEMA evaluates. Federal agencies may also participate. The participants negotiate the terms and conditions of the exercise. The exercise results in an after-action report, which the NRC ultimately receives. An Ingestion Pathway Exercise to include return, reentry, and recovery occurs every eight years. Having an effective emergency preparedness program in place is one of the conditions used by the NRC to issue, maintain, and renew operator licenses.

C. Messaging by Emergency Classification Level

Incidents at NPPs may vary in intensity from relatively minor ("Notification of Unusual Event") to potentially catastrophic ("General Emergency"). This chapter provides sample messages for delivery by the various responding organizations and adapted to the specific incident circumstances. Responding organizations disseminate the messages using appropriate means, including emergency alert system (EAS) broadcasts, tone-alert radios (TARs), news releases, news conferences and briefings, and increasingly via more technologically-based methods such as reverse 911, updating websites, blogging, and social media. Throughout this part, wherever the phrase "news release" appears, the organization may wish to complement or augment its messaging with social media releases as well (e.g., Twitter, Facebook). Responding organizations must ensure effective communication of information with individuals with disabilities using appropriate auxiliary aids and services (e.g., interpreters, audio and video captioning).

Section 1. Notification of Unusual Event

Notification of Unusual Event: Under this category, events are in process or have occurred that indicate a potential decline in the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected at that time.

Organization	Messaging and Related Actions	
Licensee	Must notify state/local/agencies within 15 minutes of emergency declaration and NRC within 60 minutes	▪ Possible news release: status update, steps being taken to resolve situation, no increased risk to public ▪ JIC may be activated, though unlikely
State, Local, and Tribal Officials	▪ Possible news release: aware and monitoring situation, no increased risk to public, prepared to respond if needed. Licensee news release usually adequate. ▪ JIC may be activated, though unlikely	
NRC	▪ No messages unless unusual circumstances. NRC notifies the DHS National Operations Center (NOC) every time an emergency event declaration is made.	
Federal Agencies	▪ No messages unless unusual circumstances	
National Spokespersons	▪ No messages unless unusual circumstances	

SECTION 2. ALERT

Alert: If an alert is declared, events are in process or have occurred that involve an actual or potentially substantial decline in the level of plant safety. However, any release of radioactive material is expected to be only a small fraction of the EPA PAGs.

Organization	Messaging and Related Actions
Licensee	Must notify state/local/ agencies within 15 minutes of emergency declaration, and NRC within 60 minutes ▪ Possible news release: status update, steps being taken to resolve situation, no increased risk to public ▪ JIC may be activated
State, Local, and Tribal Officials	▪ Possible news release: aware and monitoring situation, no increased risk to public, prepared to respond if needed ▪ JIC may be activated ▪ Press conference may be required
NRC	▪ Possible news release: monitoring situation and coordinating with other Federal agencies, incident response center at regional office activated, resident inspectors monitoring conditions for duration of incident ▪ Would notify DHS NOC, FEMA Federal Operations Center, DOE, USDA, and HHS ▪ Regional Incident Response Center staffed ▪ Resident inspector on-site [additional experts may be dispatched to site]
Federal Agencies	▪ Aware and monitoring situation ▪ No other messages unless unusual circumstances
National Spokespersons	▪ No messages unless unusual circumstances

SECTION 3. SITE AREA EMERGENCY

Site Area Emergency: Events are in process or have occurred that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the Environmental Protection Agency protective action guides except near the site boundary.

Organization	Messaging and Related Actions	
Licensee	Must notify state/local/ agencies within 15 minutes of emergency declaration, and NRC within 60 minutes	▪ News release/status update: condition of plant, repairs, stability, personnel ▪ Steps being taken to resolve situation ▪ Increased risk to public, if any ▪ JIC activated, with phone number of public inquiry line ▪ News conferences and briefings held
State, Local, and Tribal Officials	Local jurisdictions sound sirens and disseminate EAS messages with appropriate protective action decisions	▪ Issuance of EAS messages ▪ JIC activated, with phone number of public inquiry line ▪ News releases issued, news conferences and briefings held ▪ Potential for protective actions for specified zones, with boundaries or area descriptions ▪ If evacuation: what to take, where to go, how to get there, availability of transportation, and providing assistance to the whole community, including individuals with disabilities, others with access and functional needs, racially and ethnically diverse communities, and people with limited English proficiency. ▪ If shelter-in-place: instruction on staying inside, ventilation, sealing, etc. ▪ Use of potassium iodide (KI) as directed by State, local, or tribal health official; instructions for obtaining and administering KI ▪ Other protective actions: relocation of schools; closing of parks, waterways, and recreation areas; agricultural advisory for farmers; information on pets ▪ Location and status of reception and care centers, and mass care shelters ▪ Make reference to REP public information materials received annually by all households in 10-mile EPZ ▪ Possible public health briefing on effects of radiation, population monitoring, decontamination, protection of food and water ▪ Potential need for Governor's declaration of state of emergency, request for Federal disaster declaration ▪ Assistance, support, coordination with Federal agencies ▪ Stay tuned for further information and instructions
Other Neighboring State(s)	▪ If neighboring state(s) are included in 10- or 50-mile EPZ, deploy protective action messages as noted for state and local, as appropriate.	

Organization	Messaging and Related Actions
Other Neighboring State(s) (cont.)	▪ Unless neighboring state(s) included in 10- or 50-mile EPZ, protective action messages not anticipated ▪ Messages to underscore that there is no radiation danger to outlying communities (or to identify radiation hazard if it exists)
NRC	▪ Headquarters EOC activated to monitor ongoing incident; would notify DHS NOC, FEMA Federal Operations Center (FOC), DOE, USDA, EPA, and HHS ▪ Regional Incident Response Center staffed ▪ Resident inspector on-site [additional experts may be dispatched to site] ▪ If incident conditions warrant, the NRC will dispatch a Site Team, consisting of technical experts and a Site Team Director, from the Regional Office to the site. Once the Site Team is in place, authority to manage incident-related activities is turned over to that team. The Site Team provides a firsthand assessment of the situation and face-to-face communications with all participants. The Headquarters Operations Center provides round-the-clock logistical and technical support throughout the response
DHS/FEMA	NICCL and SICCL calls organized by Department of Homeland Security Office of Public Affairs ▪ Prepare for Federal coordination and emergency response roles and responsibilities ▪ Support for State and local efforts; Federal disaster request/declaration: status, implications
DHS/Customs and Border Protection	▪ Radiation monitoring procedures
DHS/US Coast Guard	▪ Radiation Detection Program ▪ Waterway closings
National Spokespersons Message suggested for senior Federal official: President, Vice President, DHS Secretary, FEMA Administrator and/or NRC Chairman	▪ The _____ nuclear power plant located in/near _____ has declared a site area emergency. Trained technical experts are working to stabilize the situation. ▪ While the situation has the potential to become serious, all indications are that the plant can be stabilized and harmful amounts of radiation are unlikely to be released into the environment. ▪ The [__facility name__] operator made the decision to shut down the plant, which should dramatically lower the likelihood of any danger to the public and workers. ▪ In coordinating with the NPP, State, local, and tribal agencies are responding to the situation as it develops and continue to take steps to protect people in the affected area. ▪ As a precaution in case conditions worsen, the following steps have already occurred: o _____ o _____ ▪ **We urge people to pay close attention to their EAS stations and to follow the instructions of their local officials**. ▪ The Federal Government is monitoring the situation through communications and coordination with the NPP, State, local, and tribal officials. The Federal Government is ready to support local and State agencies with assets and resources if needed. ▪ In coordination with technical experts at the NRC, the power plant operator is taking all possible steps to stabilize the situation.

Organization	Messaging and Related Actions
National Spokespersons (cont.)	▪ We have no specific information on the cause of the incident but there is no current evidence of any deliberate act. Of course, a full investigation will occur as soon as the situation stabilizes. ▪ The public can best help by staying tuned to television and radio broadcasts for important updates. ▪ You can also get information on the internet at [_____ Website], Facebook at[_____], and Twitter at [_____]. ▪ We ask that you use text messaging to communicate with friends and family rather than calling on landline and cell phones. This will free up phone lines so people who are in need can call for help and emergency responders can contact each other. ▪ We repeat, while there is a site area emergency, trained experts are currently working to resolve the problems. At the present time, there is no immediate danger to the public.
Other Federal Agencies	
HHS/Assistant Secretary for Preparedness & Response (ASPR)/ CDC/NIH/ Substance Abuse & Mental Health Services Administration (SAMHSA)	▪ Measures to safeguard public health ▪ Effects of radiation on human health (coordinated with state public health officials) ▪ KI and radiation countermeasures frequently asked questions ▪ Measures to cope with stress and other behavioral health implications ▪ If located near Mexico or Canada, notify World Health Organization under International Health Regulations ▪ Support to the Advisory Team for Environment, Food and Health ▪ Population monitoring
HHS/FDA	▪ Procedures and laboratory techniques for measuring radionuclide levels in food ▪ Utilization of Food Emergency Response Network (FERN) ▪ Sources for FDA-approved products, warnings for consumers to avoid counterfeit or unsafe/ineffective radiation countermeasures ▪ Communication to industry and consumers on safety of medical products manufactured in affected area ▪ Support to the Advisory Team for Environment, Food and Health
DOE	▪ Resources deployed to [location] ▪ Radiological emergency response assets: Radiological Assistance Program (RAP) teams, Federal Radiological Monitoring and Assessment Center (FRMAC), Aerial Measuring System, Consequence Management Home Team (CMHT), Radiological Emergency Assistance Center/Training Site (REAC/TS) ▪ Environmental radiological monitoring data products, monitoring results ▪ Coordination with State(s)
EPA	▪ Radiological emergency response assets: National radiation monitoring and detection system (RadNet), aerial monitoring by the Airborne Spectral Photometric Environmental Collection Technology (ASPECT), Radiological Emergency Response Team (RERT), CBRN Consequence Management Environmental Response Team (CMAT) ▪ Environmental radiation monitoring and technical resources deployed to [location] in coordination with FRMAC ▪ PAGs (what they are, how determined)

Organization	Messaging and Related Actions
EPA (cont.)	▪ Support to the Advisory Team for Environment, Food and Health
USDA	▪ Agriculture and food protection in coordination with FDA ▪ PARs for pets, service animals ▪ Coordination with State agricultural officials on livestock and crop protection ▪ Support to the Advisory Team for Environment, Food and Health
DoD	▪ Status/role of military assets deployed and accountability procedures for military service members, employees, and their families.
American Red Cross	▪ Mass care shelters, donations (national web site)
FAA	▪ Airspace closures
DOT	▪ Closing or rerouting of railroads and roads ▪ Travel to/from affected airports
US Postal Service	▪ Procedures used to check mail for radioactive material
Department of State	▪ Involvement if plant is located near Mexican or Canadian border ▪ International Atomic Energy Agency (IAEA) notifications ▪ Facilitate communications with foreign media and outreach to foreign governments regarding safety and security of foreign nationals currently in the United States. ▪ Utilize Foreign Press Center (FPC) to assist the coordinating agency in engaging credentialed foreign journalists (credentialing is a State responsibility), facilitate hub participation in dial in calls, etc. As needed, provide a State Department spokesperson for this purpose. Provide guidance to all of our posts globally so ambassadors would be equipped to assure local audiences of safety procedures for foreign nationals in the United States.
Department of Commerce: NOAA: Oceanic 7 Atmospheric Research (OAR)/NWS/National Marine Fisheries Service (NMFS)	▪ Weather data ▪ Biological sampling and analysis of ocean fish and shellfish for consumer safety ▪ Authority to close U.S. ocean waters to fishing
Other Federal Agencies	▪ Depending on incident, may also include: HHS AoA and ACF, HUD, DOI, DOJ, DOL, Veterans Affairs, GSA, SBA

SECTION 4. GENERAL EMERGENCY

General Emergency: A general emergency involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area.

Organization	Messaging and Related Actions	
Licensee	Must notify state/local/tribal agencies within 15 minutes of emergency declaration, and NRC within 60 minutes	▪ Status update: condition of plant, repairs, stability, personnel ▪ Steps being taken to resolve situation ▪ Increased risk to public, if any ▪ JIC activated, with phone number of public inquiry line ▪ News conferences and briefings held
State, Local, and Tribal Officials	Local jurisdictions sound sirens and disseminate EAS messages with appropriate protective action decisions	▪ Issuance of EAS messages ▪ JIC activated, with phone number of public inquiry line ▪ News releases issued, news conferences and briefings held ▪ Protective actions for specified zones, with boundaries or area descriptions ▪ If evacuation: what to take, where to go, how to get there, availability of transportation, and providing assistance to the whole community, including individuals with disabilities, others with access and functional needs, racially and ethnically diverse communities, and people with limited English proficiency. ▪ If shelter-in-place: instruction on staying inside, ventilation, sealing, etc. ▪ Use of KI as directed by State health director or other health official; instructions for obtaining and administering KI ▪ Other protective actions: relocation of schools; closing of parks, waterways, and recreation areas; agricultural advisory for farmers; information on pets ▪ Location and status of reception centers and mass care shelters ▪ Make reference to REP public information materials received annually by all households in 10-mile EPZ ▪ Public health briefing on effects of radiation, population monitoring, decontamination, protection of food and water ▪ Governor's declaration of state of emergency, request for Federal disaster declaration ▪ Assistance, support, coordination with Federal agencies ▪ Stay tuned for further information and instructions
Other Neighboring State(s)	▪ If neighboring state(s) are included in 10- or 50-mile EPZ, deploy protective action messages as noted for state and local, as appropriate. ▪ Unless neighboring state(s) included in 10- or 50-mile EPZ, protective action messages not anticipated ▪ Messages to underscore that there is no radiation danger to outlying communities (or to identify radiation hazard if it exists)	
NRC	▪ Under the NRIA, NRC retains its role as the Federal technical agency for the incident.	

Organization	Messaging and Related Actions
NRC (cont.)	▪ Headquarters EOC activated to monitor ongoing incident; would notify DHS NOC, FEMA Federal Operations Center (FOC), DOE, USDA, EPA, and HHS(SOC) ▪ Regional Incident Response Center staffed ▪ Resident inspector on-site [additional experts may be dispatched to site] ▪ If incident conditions warrant, the NRC will dispatch a Site Team, consisting of technical experts and a Site Team Director, from the Regional Office to the site. Once the Site Team is in place, authority to manage incident-related activities is turned over to that team. The Site Team provides a firsthand assessment of the situation and face-to-face communications with all participants. The Headquarters Operations Center provides round-the-clock logistical and technical support throughout the response ▪ Updates will be posted to special Emergency Event Web Page [via www.nrc.gov] ▪ News releases issued, news conferences and briefings held, social media used to disseminate information on NRC actions
DHS/FEMA	NICCL and SICCL calls organized by Department of Homeland Security Office of Public Affairs ▪ DHS becomes the Federal coordinating agency at the declaration of a General Emergency. ▪ Assume the lead for Federal coordination and emergency response roles and responsibilities ▪ Support for State and local efforts ▪ Federal disaster request/declaration: status, implications
DHS/US Coast Guard	▪ Radiation Detection Program ▪ Waterway closings
DHS/ Customs and Border Patrol	▪ Radiation monitoring procedures
National Spokespersons Message suggested for senior Federal official: President, Vice President, DHS Secretary, FEMA Administrator and/or NRC Chairman	▪ The _____ nuclear power plant located in/near _____ has declared a general emergency that resulted in the release of radioactive materials. ▪ Protecting the health and safety of people in the affected area is – and will remain – our number one priority. ▪ We are all working together to bring this situation under control as quickly as possible, but we need your continued patience and support. ▪ The NPP, and State, local, tribal, and Federal agencies are responding to the situation as it develops and continue to undertake many steps to protect the local population. We urge people to pay close attention to their EAS stations and follow the instructions of their local officials. ▪ The Federal Government is communicating and coordinating with the NPP, State, local, and tribal officials. The Federal Government is ready to support State, local, and tribal agencies with whatever assets and resources are needed. ▪ In response to local requests, the Federal Government [has deployed] [is in process of deploying] a variety of resources to help those in need. ▪ In coordination with technical experts at the NRC, the power plant operator is taking all possible steps to stabilize the situation and end the release. ▪ We are following existing emergency response plans for maximizing and coordinating resources within the Federal Government. This includes providing assistance to State, local, and tribal governments to protect the health and safety of the people in the communities surrounding the plant. ▪ We have no specific information on the cause of the incident but there is no current evidence of any deliberate act. Of course, a full investigation will occur as soon as the situation stabilizes.

Organization	Messaging and Related Actions
National Spokespersons (cont.)	▪ The public can best help by staying tuned to television and radio broadcasts for important updates. ▪ This is an evolving situation and conditions will continue to change, sometimes quickly. We will do our best to keep you fully informed. ▪ You can also get information on the internet at [_____ Website], Facebook at[_____], and Twitter at [_____]. ▪ We ask that you use text messaging to communicate with friends and family rather than calling on landline and cell phones. This will free up phone lines so people who are in need can call for help and emergency responders can contact each other. ▪ Visit websites of local community support and volunteer groups to see how you can help support those in need. [Provide links to volunteer sites] ▪ We, as a community and as a Nation, will recover from this incident, but this process will not happen overnight. ▪ It is critical that everyone continue to work together to support those in need.
Other Federal Agencies	
HHSASPR/ CDC/NIH/ SAMHSA	▪ Measures to safeguard public health ▪ Effects of radiation on human health (coordinated with state public health officials) ▪ Measures to cope with stress and other behavioral health implications ▪ KI and radiation countermeasures frequently asked questions ▪ Population monitoring ▪ Support to the Advisory Team for Environment, Food and Health ▪ Assess event for potential notification to the WHO under the International Health Regulations (2005).
HHS/FDA	▪ Procedures and laboratory techniques for measuring radionuclide levels in food ▪ Utilization of Food Emergency Response Network (FERN) ▪ Sources for FDA-approved products, warnings for consumers to avoid counterfeit or unsafe/ineffective radiation countermeasures ▪ Communication to industry and consumers on safety of medical products manufactured in affected area ▪ Support to the Advisory Team for Environment, Food and Health
DOE	▪ Resources deployed to [location] ▪ Radiological emergency response assets: Radiological Assistance Program (RAP) teams, FRMAC, Aerial Measuring System, CMHT, REAC/TS ▪ Environmental radiological monitoring data products, monitoring results ▪ Coordination with State(s)
Department of Commerce: NWS/NOAA	▪ Weather data ▪ Biological sampling and analysis of ocean fish and shellfish for consumer safety ▪ Authority to close U.S. ocean waters to fishing
EPA	▪ Radiological emergency response assets: National radiation monitoring and detection system (RadNet), aerial monitoring by the Airborne Spectral Photometric Environmental Collection Technology (ASPECT), Radiological Emergency Response Team (RERT), CBRN Consequence Management Environmental Response Team (CMAT) ▪ Environmental radiation monitoring and technical resources deployed to [location] in coordination with FRMAC ▪ PAGs (what they are, how determined) ▪ Support to the Advisory Team for Environment, Food and Health
USDA	▪ Agriculture and food protection in coordination with FDA ▪ PARs for pets, service animals

Organization	Messaging and Related Actions
USDA (cont.)	▪ Coordination with state agricultural officials on livestock and crop protection ▪ Support to the Advisory Team for Environment, Food and Health
DoD	▪ Status/role of military assets deployed and accountability procedures for military service members, employees, and their families.
US Coast Guard	▪ Radiation Detection Program ▪ Waterway closings
American Red Cross	▪ Mass care shelters, donations (national web site)
FAA	▪ Airspace closures
DOT	▪ Closing or rerouting of railroads and roads ▪ Travel to/from affected airports
US Postal Service	▪ Procedures used to check mail for radioactive material
Department of State	▪ Involvement if plant is located near Mexican or Canadian border ▪ IAEA notifications ▪ Facilitate communications with foreign media and outreach to foreign governments regarding safety and security of foreign nationals currently in the United States. ▪ Utilize Foreign Press Center (FPC) to assist the coordinating agency in engaging credentialed foreign journalists (credentialing is a State responsibility), facilitate hub participation in dial in calls, etc. As needed, provide a State Department spokesperson for this purpose. Provide guidance to all of our posts globally so ambassadors would be equipped to assure local audiences of safety procedures for foreign nationals in the United States.
Other Federal Agencies	▪ Depending on incident, may also include: AoA and ACF, HUD, DOI, DOJ, DOL, Veterans Affairs, GSA

D. CRITICAL QUESTIONS AND ANSWERS FOR NATIONAL SPOKESPERSONS

These questions and answers are intended as guidance for senior Federal leaders who will be speaking to the public in the immediate aftermath of an incident at an NPP that may result or has resulted in a release of radioactive materials to the environment. This list is not exhaustive, but rather provides the most important pieces of information to support a leadership statement. It is assumed that specific details about the incident and the response will come from the responding agencies (States, local, and tribal as well as NPP licensees), not from Federal senior officials. Much more detail is provided in the reference and resource section in the appendix to this document.

Federal, State, tribal, and local officials may be overwhelmed during an NPP incident. Subject matter experts familiar with radiation, KI, and other subjects (e.g., health physicists) should be identified in advance in order to explain critical concepts to officials at all levels and the media as needed.

Current Situation at the Nuclear Power Plant

(Because these questions are situation-dependent, this guide does not provide answers. This list serves to alert officials to questions they will likely field about the incident.)

What happened?

Has anyone been hurt? Has anyone died?

When did this incident occur?

Was it deliberate? Was it a terrorist attack?

What caused the release of radioactive material?

How much radioactive material has been released?

What radioactive materials have been spread as a result of the release?

Is it still occurring? Is the situation under control?

What's being done to stop the release?

Where is the plume going?

How far does it extend?

Can we expect the plume to keep spreading?

What can we expect next?

How long will it take for the situation to return to normal?

How different is this emergency from releases at the Fukushima Daiichi NPP in Japan (or Three Mile Island or Chernobyl)?

Protecting the Public

1. **Is there an immediate danger?**
   - People are being told to evacuate or stay inside (shelter-in-place) because exposure to the radioactive material outside is potentially dangerous.
     - If you were instructed to stay inside, remain inside until you are told otherwise by local authorities.
     - Having walls, brick, concrete, or soil between yourself and the source of radiation can help reduce your radiation dose.
   - If you were instructed to evacuate, please do so immediately, following instructions of emergency officials.
   - Instructions may be updated based on location and situation.
   - Instructions given by local or State officials are for your safety.
   - Continue to stay tuned to official channels for the most up to date information.

2. **What effects has this had on the people in the affected communities?**
   - While it is too early to know the specific impacts, we know that there has been a serious [catastrophic] incident that has significantly affected many people, disrupted lives, and may have caused numerous medical issues.
   - We will do everything we can to help the people affected.
   - As we continue life-saving and protection activities, we urge people to follow the instructions of State and local officials and responders.
     - These instructions are being broadcast over TV, radio, websites, and by many other means.
     - These instructions are based on the best information we have right now and may be updated based on your location and as we gather more information.
     - These instructions are for your safety.

3. **Who should evacuate and who should go inside and stay inside?**
   - As stated by [insert official], people in [area/location] should evacuate and people in [area/location] should go inside and stay inside
   - Officials work with experts to determine the actions that will keep exposure to the public as low as possible.
   - Local officials' number one priority is to protect people from exposure to potentially dangerous levels of radiation.
     - Depending on specific conditions, radiation levels can be dangerous.
     - The two main protective actions are evacuation (leave the area) and sheltering-in-place (go inside and stay inside).
     - These decisions are based on radiation science and other important factors such as direction of the wind, amount and type of radioactive material released, and how quickly radiation levels decrease.

4. What should people do if they're told to evacuate?

- If you are told to evacuate, leave the area immediately
- When the public evacuates, they are moved to safer areas depending on levels of radiation and radioactive material in order to keep exposures as low as possible, and under most conditions evacuation is preferred.
- If you are told to evacuate:
    - If available, follow the detailed instructions provided in the emergency calendar or other material you were sent in the mail.
    - Pay close attention to what officials are telling you.
    - Take the designated routes to reception centers where you will be registered and checked for contamination.
    - Transportation will be provided to those who need it, including physically accessible transportation for people with disabilities. Limit calls to emergencies only, so those who need immediate help can be addressed in a timely manner. Text messaging may work during high volume periods because it does not require as many system resources.
    - Follow the instructions of law enforcement personnel.

5. What should people do if they're told to shelter-in-place?

- If you are told to shelter-in-place, go inside a building immediately.
- Sheltering-in-place may be ordered in some cases.
    - In some situations sheltering-in-place may provide protection that is equal to or even greater than evacuation, such as in cases where weather, traffic, competing events, or short-term releases are factors.
    - During a relatively short-term release, the population may be instructed to shelter-in-place, such as at home, a workplace, school, or shopping mall. Depending on the type of walls, sheltering-in-place can result in a radiation dose reduction of up to 80% compared to being outdoors.
    - If you are told to go inside, follow your emergency instructions or go to the basement of your building or the center of the middle floors of a multi-story building (for example, the center of the 5th floor of a 10-story building, or the 10th to 20th floors of a 30-story building). If possible, close windows/shut off HVAC that brings in outdoor air until the plume has passed.
    - Keep listening to your radio or TV for updated instructions.
    - These instructions may conflict with your natural instinct to evacuate from a dangerous area; however, health risks from radiation exposure can be greatly reduced by:
        - Putting walls, brick, concrete, or soil between you and the radioactive material outside, and
        - Increasing the distance between you and the exterior walls, roofs and ground, where radioactive material is settling.
    - Individuals who are sheltering-in-place will be instructed to leave the area as soon as the risk from exposure decreases.
- Please follow instructions from emergency officials.
    - Whether you are told to stay inside (shelter-in-place) or evacuate, these instructions are meant to limit your exposure to radiation and minimize your risk of contamination.
    - The decision to evacuate or stay inside (shelter-in-place) is made by emergency officials using the best technical information available to them.

6. What should people do if they are told to stay inside but do not have food, water, or medications?

- Continue to remain inside for as long as you can until you receive additional instructions from authorities.
  - Staying inside will help protect you from the radiation and other hazards associated with the incident
  - Please remember that leaving your location may expose you to additional radiation.
  - Once authorities provide instructions that it is safe to go outside, quickly but safely proceed to designated assembly areas or shelters if you require food, water, or medical attention.
- For food or water concerns:
  - Authorities are aware of the limitations in food and water and are making efforts to resolve these issues.
- For needed medication concerns:
  - Stay sheltered for as long as possible.
  - If the lack of medication(s) creates a life-threatening condition that requires immediate medical attention, please call 911 or proceed to the nearest fire station, hospital, or medical triage area for assistance.
- For non-life-threatening medical care:
  - If you have injuries or an illness that do not require immediate medical attention, please remain in your shelter until you are told it is safe to proceed to your nearest fire station, hospital, or medical triage area for assistance.

7. Who makes the decision for people to shelter-in-place or evacuate if an emergency occurs?

- The State (or in some cases, a county or local official) makes the decision, based on information from the NPP. The State (or local) officials may discuss the situation with NRC and seek its advice, but the ultimate decision is the responsibility of State (or local) officials who have the most accurate information and know the local situation best.

8. How do people learn if they need to shelter-in-place or evacuate?

- Persons located within about a ten-mile radius of a nuclear facility will be alerted by means of sirens, Tone Alert Radios (TARs), and similar alert mechanisms.
- This lets them know to turn on their radios, TVs, computer, or other means for detailed instructions.
- Persons living in the vicinity of an NPP should have received an annual information update, via an emergency calendar or other material, with instructions that they should follow.

9. Are care shelters available for people who are evacuating?

- Yes, designated shelters have been opened.
- Most are managed by the American Red Cross.
- You should first go to the reception center to be checked for contamination, and then to a shelter, or you can stay at a hotel or with family or friends. If you are in the ten-mile Emergency Planning Zone, this is listed in the emergency materials you have been sent.
- Even though shelters provide water, food, medicine, basic sanitary facilities, and disability-related assistance/functional needs support services (DRA/FNSS), you should plan to take your prescription medicine and disaster supplies kit with you so you will have the supplies that you need. If you are in the ten-mile EPZ, these are listed in the emergency materials you may have been sent.

10. What's being done to protect schoolchildren?

- Following their plans, schools were evacuated in advance of the general population and the children were relocated to their designated host schools, as indicated in the emergency information materials provided locally.
- They are safely under the care of their regular teachers.
- Parents should not go to their children's school to pick them up but to the host school once instructed to do so. This will ensure your children are there when you arrive.

11. What's being done to protect people in hospitals and nursing homes, and people at home who are too sick or don't have transportation?

- Family members, neighbors, or local emergency management agencies ensured appropriate provisions to evacuate those who cannot care for themselves.
- Nursing homes, hospitals, and other care centers have their own plans either to evacuate or shelter in place, depending on the circumstances.
- If you need assistance evacuating, please contact _____.

12. Is the food safe to eat?

- If you are concerned about the safety of your food:
    - Wash your hands with soap and water before handling food. This will help remove any radioactive material that might be on your hands, limiting its spread to your food.
    - Use a damp towel or cloth to clean all cans, bottles, packaged foods, counters, plates, pots, and utensils before using them.
    - Seal these towels or cleaning cloths in a plastic bag and place them away from people and animals.
    - In order to keep radioactive material from falling on areas that you already cleaned, remember to work from the higher areas to the lower levels.
    - Food in sealed containers and any unspoiled food in your refrigerator or freezer is safe to eat.
    - Consumers can call the toll-free USDA Meat and Poultry Hotline 24 hours a day at 1-888-MPHotline (1-888-674-6854); for the hearing impaired (TTY) 1-800-256-7072.
- (See question 56 for Breastfeeding mothers)

13. Can people eat food from their gardens or locally caught fish and game?

- Do not eat food from your garden if you suspect that radioactive material has settled on it.
- It is possible that the radioactive fallout has contaminated the ground and any crops that were planted.
- Locally caught fish and game should be tested for radioactive contamination before it is eaten. Local response authorities will be testing fish and game and will notify you when it is safe to eat.
- Listen for instructions from State and local officials and responders regarding food safety.

14. Is the water safe to drink?

- Until we have drinking water test results, only bottled water is certain to be free of contamination.
- You can safely drink water, juices or other drinks in sealed containers or in your refrigerator or freezer.
  - A sealed package or storage location will protect the liquid inside from radioactive contamination.
  - If a sealed container was exposed to radioactive dust outside, use a clean towel to wipe off the bottle to remove any radioactive material before opening it.
- Tap or well water can be used for cleaning yourself and your food.
  - The risk from having radioactive material on your body or consuming radioactive material on your food is significantly reduced by washing, even if the water itself is contaminated.
  - Boiling tap water does not get rid of radioactive material.
- If needed, water in a toilet tank or from a hot water heater tank will also be free of radioactive contamination

15. Is the air safe to breathe?

- The radioactive material released in the air can give a radiation dose.
- Please follow safety instructions provided by State and local officials and stay tuned because instructions will change as they receive new information.
  - Covering your mouth and nose with a protective layer – like a mask, cloth, or towel – can help reduce the amount of particles you breathe.
  - If you have been instructed to stay inside, it is because walls can provide protection from the radioactive material outside.
    - If possible, close windows/shut off HVAC that brings in outdoor air until the plume has passed.
    - We are tracking the radiation levels and authorities will instruct you to leave the area when it is in your best interest to do so.
- Federal, State, and local partners are monitoring to determine the location and levels of radioactive material on the ground and in the air.
  - Weather will be a major factor in determining where the radioactive material goes because it is carried by the wind as it moves through the atmosphere and can deposit based on wind speed and be brought to the ground by precipitation such as rain or snow.
  - We will work with State and local officials to release the monitoring information to local responders and the public as soon as it is available.

16. What should people do if they are on a boat near the affected area?

- Boats do not provide adequate protection from radioactive material; distance from the incident will.
- Dust- or sand-like particles that land on the boat should be carefully and quickly washed or swept off. Be sure to avoid inhaling or coming directly into contact with these particles.
- Either return to a marina or boat landing and find a building for shelter and go inside immediately or navigate to a distance far enough away from the incident.

17. When will it be safe for people to return to their homes and businesses?

- Federal, State, local, and tribal partners are collecting information about the impacted areas to determine the extent and levels of contamination.
    - Until this is done we cannot predict when people can begin returning to the area.
    - Local and State officials will use the information collected to determine appropriate safety measures for people in their jurisdictions.
- If you have been evacuated, do not return until you are told it is acceptable to do so by authorities.
    - Please do not put yourself in danger by attempting to return early.
    - Attempting to return early could divert responders' efforts away from those who need immediate assistance.
- A long, difficult cleanup may await us and the most important goal of the cleanup is to protect public health.
    - This radioactive material release has created areas where radiation could be dangerously high.
    - It may be months or years before the most contaminated areas are reoccupied.
- Certain people with special requirements – for example, those who need to milk or feed livestock, shut off major machinery, or retrieve medications – may receive special permission to enter certain areas for brief periods.
    - Law enforcement personnel are at access control points to screen people who have permission to return.

18. How can people learn about the safety of other family members?

- At this time, responders are in the process of gathering and organizing all vital information available.
    - Registries are being set up at evacuation centers.
    - The American Red Cross and other organizations are actively involved.
- We encourage you to seek additional information and/or counseling services at [LIST ORGANIZATIONS or LOCATIONS].

19. What is potassium iodide (KI)?

- Potassium iodide is a salt, similar to table salt. It is often referred to as KI, which is its chemical symbol.
- Potassium iodide, if taken in time and at the appropriate dosage, blocks radioactive iodine from being absorbed by the thyroid gland. This could reduce the risk of thyroid cancers and diseases that might otherwise be caused by exposure to radioactive iodine that could be dispersed in a severe nuclear accident.

20. Will KI protect people from radiation?

- No. KI only protects the thyroid gland from radioactive iodine exposure.
    - To protect your whole body, follow the instructions of local officials.
    - KI is a reasonable, prudent, and inexpensive supplement to other protective actions.

21. Why isn't KI being provided to everyone around the NPPs?

- The decision to provide or not provide KI is made at the State, local, or tribal level.

22. What should people do about pets?

- Service animals are permitted at shelters.
- There are several sheltering options for your pet that may be available.
    - If you arrive at the emergency shelter with your pet, the shelter should have a plan in place for handling your pet. The shelter may need to separate you from your pet, depending on how their plan addresses the issue.
    - Stay with friends or relatives outside the evacuation area who will house both you and your pet.
    - You can try locating a motel or hotel that will allow you to stay with your pet.
    - Listen to local radio/news broadcasts for information on pet evacuation and the locations of available pet shelters.

23. Is pet food safe?

- Just like our food, if pet food is sealed it should be safe to consume.
- If the outside of the can or package appears to have dust or debris on it, rinse the closed item with tap water or wipe with a disposable damp cloth.
- Seal these cleaning cloths in a plastic bag and place them away from people and animals.

24. What should farmers do with their crops?

- We are asking farmers in [AREA] not to tend, harvest, eat, or distribute their crops until radiation monitoring and sampling results are analyzed, unless otherwise directed.
- We recognize that your crops are your livelihood, and State, local, and tribal officials will keep you informed as radiation monitoring and sampling results come in.

25. What should farmers and ranch owners do with livestock?

- If you are being asked to stay inside (shelter-in-place) or evacuate, follow the instructions of State, local, and tribal officials.
    - These instructions are for your safety.
- We are asking farmers and ranchers in [AREA] not to tend or transport their livestock and to not consume or distribute milk from dairy animals until radiation monitoring and sampling results are analyzed, unless otherwise directed. If you have milk producing animals, contact state, local, or tribal officials for guidance.
- Take these simple steps to protect your livestock from eating feed or drinking water contaminated with radioactive material:
    - Move your livestock indoors, away from more highly contaminated areas outside.
    - Use only stored feed and covered water. If possible, avoid using hay or alfalfa kept outside.
- As we get monitoring and sampling data we will be able to provide additional instructions about caring for livestock.

Emergency Response and Recovery

26. What is being done in response to the release of radioactive material?

- The [unit/plant] has been shut down and, as it cools, the source of the radiation will diminish. Highly skilled teams are at the plant working to shut off the path of the release to the environment.
- It is still early in the response, and our focus is on protecting public health and safety.
    - Specialized teams are inside and outside the plant boundaries assessing the nature and extent of the incident, damage to the nuclear power plant, and radioactive contamination that may have been released.
- Federal, State, local, and tribal responders are coordinating closely to respond as effectively as possible.
    - Responders are working to protect those in the path of the release.
    - We believe all those in the immediate downwind areas have evacuated to safety or are staying indoors (sheltering-in-place) as instructed.
    - The release has created some areas where the levels of radiation are too high for responders to enter at this time.
- State and local officials have issued safety instructions.
    - We are asking people to follow these instructions and stay tuned.
    - Instructions may be updated as we get more information.
    - These instructions are for your safety.

27. Who is responsible for managing the response?

- State, local, and tribal emergency officials are in charge of the immediate response.
- They know the local situation best and have trained responders and plans in place to manage the response.
- A number of Federal agencies are assisting, particularly with assets unique to the Federal government.
- We are coordinating to maximize our assets and respond as quickly and safely as possible.

28. What is the Federal government doing to respond?

- State, local, and tribal emergency officials are in charge of the immediate response. The Federal Government is assisting with all the resources it has.
    - The Federal, State, local, and tribal responders are coordinating closely to respond as effectively as possible.
    - Federal responders from across the country have deployed [are being deployed] and officials continue to coordinate resources.
    - The Federal Government is following existing emergency response plans for maximizing resources, coordinating across all levels of government and helping those in need.
    - Agencies and responders at all levels have conducted many drills and exercises and are well trained and equipped to respond to this incident.

29. Is it safe for emergency responders to enter the contaminated area?

- We imperative to keep our responders safe so they can do their job, which includes protecting people and providing security.
- For their own protection, emergency responders may be asked to enter contaminated areas for only a limited amount of time, or with special equipment.
- Guidelines established by radiation experts are used by emergency responders to determine where they can go and how long they should stay.
- Special devices measure levels of radiation or radioactivity in various areas so emergency responders can determine if and how long they should stay in contaminated areas.
- As radiation levels decrease over time, we will assess and revise our response efforts.
- We will keep you updated on the situation.

30. Will there be an investigation to figure out what happened?

- Yes. Incident investigation is a formal process conducted for the purpose of accident prevention.
    - The NRC Incident Investigation program provides a formal, structured, and measured investigative response to significant operational incidents based on their safety significance.
    - This process includes gathering and analyzing information; determining findings and conclusions, which include the causes of a significant operational incident; and disseminating the investigation results for NRC, industry, and public review.
- The NRC staff evaluates incident reports to identify significant weaknesses in plant design and operation, or equipment problems that may systematically affect several plants of a given design.
- The plant will not be reopened until the source of the problem is fully identified, the remedies are put into effect, inspections occur, and we are fully assured of its safety.
- When generic safety issues are identified, NRC staff formally tracks them, and may initiate formal communications with industry stakeholders to provide awareness and resolution of such issues.

31. Can the contaminated areas ever be cleaned up and returned to their former use?

- Right now we are focused on assuring the health and safety of all those affected, and making sure they are kept out of harm's way.
- Affected areas are being cordoned off until we determine the locations and the levels of radiation.
- As soon as the immediate emergency is over and the plant is fully stabilized, we will carefully assess the extent of the contamination.
    - All areas possibly affected will be sampled and analyzed to determine the extent of contamination.
    - Once we clearly know the facts, a cleanup plan will be developed, including identifying who is responsible for the cleanup.
    - It is probable that contaminated land will be returned to its former use. However, areas will not be returned to their former use until we are sure they do not pose a risk to human health.

32. Has a Federal disaster declaration been made? What does that do?

- Yes [if correct]. Governor _____ has requested a disaster declaration and the President [has/has not yet] signed it.
- The declaration makes available a wide range of Federal resources to State, local, and tribal governments to aid the response, and to help individuals and businesses affected by the incident in their recovery.

33. Will people and businesses be compensated for the disruption and money they've lost as a result of the incident?

- All companies in the nuclear industry contribute to a pool of funds under the Price-Anderson Act to compensate those impacted by the incident.
  - A claims process will be set up soon.
  - Notice about when and where to file claims will be made available through the media.
  - Like any other insurance, the specific amounts will be determined based on losses incurred.

34. Are NPPs safe?

- NPPs are designed and built to rigorous standards of safety.
  - Safety standards are set by the NRC.
  - Operating licenses are granted only to plants that meet all the safety requirements. NPPs are constantly inspected to ensure compliance.
  - In addition to general standards, safety systems for plants are designed to meet specific site requirements.
  - All plants are built with multiple barriers and safety systems to make the probability that radioactive material can escape to the environment as low as reasonably achievable.

35. Should we shut down all our NPPs until we're sure they're safe?

- While [insert: agency or Federal Government] will conduct a thorough investigation to determine what happened, there is no reason to believe this was a systemic problem. Shutting down other plants would be unnecessary and a premature response to this particular situation.
- NPPs in the U.S. have a very strong record of safely producing power.

36. Are governments prepared to deal with NPP emergencies?

- Yes. All communities and States where NPPs are located are required to have up-to-date plans and procedures to deal with all possible emergencies. The NRC will not allow an NPP to maintain its operating license without these plans.
- The responsibility for responding to incidents, both natural and man-made, begins at the local level – with power plant operators, individuals, and public officials in the county, city, or town affected by the incident.
- The Federal Government has many resources and additional trained experts to help when called on.
- Frequent drills and exercises are conducted to assure that the plans – both at the plant and in the surrounding communities – are successful, and that personnel are fully trained and well-coordinated.
- The NRF lays out in detail the role of the Federal Government in dealing with many kinds of emergencies, generally in support of State, local, and tribal responders.

37. How will this incident affect our relationships with other countries?

- The Department of State will facilitate communications with foreign media and outreach to foreign governments regarding safety and security of foreign nationals currently in the United States.
- We have a treaty that requires us to notify the International Atomic Energy Agency (IAEA) when these incidents occur. The Department of State has done so [if appropriate].

38. Will this affect air travel?

- Until we have more information, expect air travel in and near the affected area to be restricted.
- This is to keep air crews and passengers safe.
- Possible inspections before departures may need to take place.
- It also keeps the airspace free for response and recovery activities.

39. Will this affect travel on waterways, both at home and abroad?

- Until we have more information, expect the use of navigable waterways in the affected area to be restricted.
- This is to keep mariners, other waterway users, and passengers safe.
- Possible inspections before departures may need to take place.
- It also keeps the waterways free for response and recovery activities.

Radiation and Radioactive Material Monitoring

40. How much radioactive material has been released from the NPP?

- The release is still under way [or the release has been stopped]. We won't have specific information until we do monitoring and analysis, both on the ground and via aerial surveillance.
- But based on what we know of the plant's operations we can state that the plant is likely to have emitted [_____].

41. How do you monitor/detect radiation?

- Specialized instruments are used to detect radiation.
- No one detector can accurately measure all types of radiation.
- Specialized emergency responders are trained and skilled in using these instruments.
- Information about the amount and composition of radioactive materials that may have been released comes from several sources:
    - The power plant's monitoring equipment.
    - Computer models.
    - Ground and aerial sampling and analysis.

42. Will radioactive material from an NPP accident spread out over the entire ten-mile EPZ?

- Probably not.
- A radioactive plume (cloud containing radioactive materials discharged from the NPP during an accident) travels in the same direction as the wind rather than spreading out over the entire EPZ.
- The nature of the plume characteristics is based on natural environmental factors, such as terrain, wind speed, wind direction, temperature of the air released, temperature at ground level and higher elevations, and turbulence due to solar heating.
    - As radioactive material is released from the NPP to the surrounding air, it travels downwind and expands both upward and outward.
    - The expansion of the plume causes the concentration of the radioactive material in the plume to decrease as it travels away from the source and deposits on the land it crosses. Precipitation also removes radioactive material from the plume, increasing deposition on the ground and decreasing concentration in the plume farther downwind.
- The radiation dose to persons in the plume is a function of the concentration of the radioactivity at any point in the plume. So, as the plume expands downwind, the concentration decreases as does the radiation dose.

43. What areas are contaminated and how will you notify the public?

- State, local, and tribal governments will determine the relative safety of the affected areas and communicate their decision(s) through traditional media outlets.
    - Monitoring and sampling are being conducted to confirm the locations of the affected and unaffected areas.
    - A monitoring and sampling plan [is being/has been] developed and will be updated as new information comes in.
    - It is important to identify areas that have not been contaminated so officials can make the right decisions about what actions to take.
- People will be informed of our findings as the information comes in and is verified.

44. What are the environmental effects of a radioactive material release?

- Responders are collecting environmental samples to get a complete picture of the extent of the environmental impacts.
  - Federal, State, local, and tribal partners are working together to implement plans for sampling and analysis.
  - Right now we are gathering information that has a direct impact on public safety, such as levels of contamination, while taking into account the need to protect our field teams and responders.
- Monitoring will be ongoing for some period of time. We will be continually analyzing all types of samples that will help us understand the environmental impacts. These samples will include but are not limited to precipitation, bodies of water, soil, vegetation, crops, livestock, fish, and milk.
- A representative analysis to determine the extent of the contamination is the appropriate way to understand the environmental impacts from this incident.

45. How do people know if they have been exposed to radiation and to radioactive material?

- The only way to be certain is to get monitored at a monitoring and decontamination center, as identified in the State, local, and tribal emergency plans.
- If you are near the incident, you may have been exposed to radiation and you also may be contaminated by radioactive material.
  - Exposure to small amounts of radiation will not produce any immediate health effects.
- A large dose of radiation may cause skin burns, nausea and vomiting.
  - If you have these symptoms, seek medical attention immediately.
- Emergency responders will monitor the levels of radiation and State, local, and tribal government officials will use this information to determine areas of concern.

46. How and why are you tracking people who have been exposed to radiation and radioactive material?

- Your local officials will set up community reception centers to check people for contamination with radioactive material and assist them with needed services and enter them into a registry [if indicated] for tracking and follow-up.
- The registry permits follow-up with people who need immediate health care and enables long-term health monitoring for individuals who have been exposed to radiation.

47. Are we tracking the radioactive material as it moves around the earth?

- We have estimated and are monitoring the actual path of the radioactive material in the atmosphere.
- Right now we are identifying areas of concern for potential harmful radiation exposures and contaminated areas.
- As the radioactive material moves through the atmosphere and radioactive material falls to the ground, the air becomes less hazardous.

Exposure, Contamination and Decontamination

48. What is radiation?

- Radiation is the release of energy from unstable atoms in the form of particles or waves.
  - Everything is made of atoms.
  - Some atoms are unstable and release energy to become stable.
  - These atoms are radioactive.
- Radiation can be detected using special equipment.
  - People cannot see, smell, hear, feel, or taste radiation.
  - With the correct instruments, radiation is easily detectable.
- Radiation affects people by depositing energy in body tissue.
  - When an incident occurs, scientists can predict how much radiation energy a person might absorb.
  - There is a direct relationship between how much radiation energy a person absorbs (dose), how fast they absorb it (dose rate), and potential health effects.
  - Unnecessary radiation exposure should be avoided.

49. What's the difference between alpha, beta, and gamma radiation? How do these types of radiation affect people?

- Alpha radiation (also called alpha particles):
  - Alpha particles cannot penetrate most matter. A piece of paper, clothing, or the outer layers of skin is sufficient to stop alpha particles.
  - Radioactive material that emits alpha particles (alpha emitters) can give a radiation dose when inhaled, swallowed, or absorbed into the blood stream through wounds.
- Beta radiation (also called beta particles):
  - Beta particles can be stopped by a layer of clothing or by a few millimeters of a substance such as aluminum.
  - Beta particles are capable of penetrating the skin and causing cutaneous radiation injury, but this is not likely to occur from an NPP incident.
  - As with alpha emitters, beta emitters can produce a radiation dose when they are inhaled or swallowed or absorbed into the blood stream through wounds.
  - Radioactive materials released during an NPP incident primarily produce beta particles and gamma rays.
- Gamma radiation (or gamma rays):
  - Gamma rays are essentially the same as X-rays. They are a type of penetrating radiation. Denser and thicker materials stop them better. Several feet of concrete or a few inches of lead are required to stop most of them.
  - Gamma rays are a radiation hazard for the entire body.
  - While gamma rays can easily pass completely through the human body, some fraction of the energy will always be absorbed by body tissue.
  - Gamma rays can cause a radiation dose even if the radioactive material does not get into our bodies.

50. How much radiation is safe? How much is considered low risk?

- According to radiation safety experts, radiation exposure between 5–10 rem usually results in little to no harmful health effects.
    - Infants, the elderly and pregnant women are more sensitive to radiation exposure than healthy adults.
- It takes a large dose of radiation—more than 75 rem—in a short amount of time (usually minutes) to cause immediate health effects like acute radiation sickness.
    - Differences like age, gender and even previous exposure are factors that might influence a body's reaction to radiation exposure.
- You can lower your risk of developing health effects by limiting your exposure to radiation.
    - Get inside a building or to a basement to protect yourself.
    - Get clean.
    - Listen to officials and emergency responders for further safety instructions.

51. Does radiation cause cancer?

- Radiation from natural background and other man-made sources is a minor contributor to our overall cancer risk.
- According to radiation safety experts, radiation exposure between 5–10 rem usually results in little to no harmful health effects.
- The risk of radiation causing cancer increases with the radiation dose.
    - During an emergency listen to local officials for instructions.
    - Advice given during emergencies is meant to limit unnecessary radiation dose.
    - Follow instructions to minimize exposure.

52. Are people at risk for radiation poisoning or sickness?

- Radiation sickness occurs only when a person is exposed to very high levels of radiation (more than 75 rem).
- Pregnant women**,** infants, and young children are more susceptible to the health effects of radiation exposure.
- The steps for reducing radiation exposure are the same for all populations.

53. What is Acute Radiation Syndrome/Sickness (ARS)?

- ARS is an illness from short-term exposure to a large amount of radiation.
    - You cannot get ARS from chronic long-term exposure to small amounts of radiation.
    - The radiation must reach internal organs.
    - Symptoms appear within minutes or days.
- It is important to know the signs and symptoms.
    - Signs of ARS include: injury like a burn or rash, nausea, and/or vomiting.
    - The symptoms may subside and come back.
    - ARS can lead to death.
- Seek medical attention immediately if you think you are suffering from ARS.

54. Are there any treatments for radiation sickness?

- There are limited treatments available for people with radiation sickness.
- Local emergency workers and medical professionals will monitor (evaluate, check) the situation to determine if medical treatments are needed and what kind of medical treatment to provide.
- Although we expect cases of radiation sickness to be extremely rare, seek medical attention immediately if you have these symptoms: skin burns, nausea, and/or vomiting.

55. Are there specific protective actions for pregnant women?

- Pregnant women should follow any specific guidance for women who are actually or potentially pregnant, as well as the same protective action steps as the rest of the population.
- Pregnant women should inform response and safety officials about their condition so that they can receive proper attention.
- Pregnant women should call or visit their doctor or OB/GYN as soon as possible if they have concerns.

56. Should nursing mothers continue to breastfeed?

- Some radioactive materials can be passed through breast milk. If you are near an incident, you may have been exposed to radioactive material.
- If you think you have been contaminated by radioactive fallout, medical workers may tell you to use formula instead of breast milk. When possible, contact your doctor for further instructions or advice. You may continue to breastfeed if there is no other source of food available.
- Tell emergency workers that you are breastfeeding so they can so they can advise you of any health risks associated with continuing to breastfeed.

57. How is background radiation distinguished from radiation emitted by the power plant?

- Distinguishing between background radiation and radiation from a specific incident may require special instruments.
- In some areas we have historical baseline data on background radiation levels.
- In a situation like an accidental release from an NPP, there will be areas where radiation levels are clearly above background levels.
- Certain substances may be found in releases from a NPP that are not normally found in the environment, and special equipment can be used so it is possible to tell the difference.
- As we gather more information, our radiation scientists will help identify the specific radioactive materials from this incident.

58. What are exposure limits? Who sets them?

- The NRC requires that users of radioactive materials, including NPPs, keep radiation exposures within the NRC's specified dose limits and as low as reasonably achievable.
- The EPA has developed a series of PAGs that suggest precautions State, local, and tribal authorities can take during an emergency to help people avoid receiving an additional amount of radiation that might be dangerous to their health.
    - PAGs provide guidance only, but typically are incorporated into offsite response plans and are used as the basis for determining protective actions.
- The National Council on Radiation Protection and Measurements (NCRP) estimates that an average person in the United States receives a total annual dose of about 0.62 rem (620 millirem) from all radiation sources, natural and man-made.

59. What is the difference between radiation exposure and radioactive contamination?

- Exposure occurs when radiation interacts with the body.
    - Exposure can be long-term at low levels, such as that from background radiation (the radiation that is in the environment all the time).
    - Or exposure can be short-term at a high dose, such as that from a major accident, diagnostic medical imaging or radiation therapy.
    - Health effects depend on the strength and length of the exposure.
- You can be exposed to radiation without being contaminated.
- External radioactive contamination (or external contamination) occurs when radioactive material settles on a surface.
    - That surface could be your body or clothing, a structure, or an object.
    - If a person is externally contaminated with radioactive material, they are being exposed to radiation from radioactive material outside but on the surface of his or her body.
- Internal radioactive contamination (or internal contamination) occurs when radioactive material enters the body.
    - If a person is internally contaminated with radioactive material, they are being exposed to radiation from radioactive material inside their body.
    - This can occur after radioactive material is swallowed, inhaled, injected, or absorbed through the skin or wounds.

60. How long does an exposed person have to remove external contamination from their body?

- There is no set time. People should remove external contamination as soon as possible to reduce their radiation dose by using the following simple steps.
- If you think you have been externally contaminated, the best thing to do is take a shower.
    - Remove your clothing (being careful not to inhale contamination or get it into your mouth or eyes); put it in a plastic bag and place it outside or in an out-of-the way area.
    - Shower using lukewarm water and lots of soap and water. Wash your hair with shampoo or soap and water. Do not use conditioner in your hair because it will bind radioactive material to your hair, keeping it from rinsing out easily.
    - Be careful not to scratch the skin.
- If you have water but cannot shower, remove the outer layer of clothing and wash exposed areas.
    - This can remove up to 90% of the contamination.
    - Place the clothing in a plastic bag; leave it outside or in an out-of-the-way area.
    - When dusting off your hair or clothing, stand away from other people and be careful not to breathe in the dust or get it in your mouth or eyes.
    - Wash exposed skin using lots of soap and lukewarm water.
- If you do not have access to water, use one of the following:
    - It is best to clean off with a moist towelette or baby wipe.
    - Otherwise, clean off with dry paper towels.
        - Dispose of the towels with the clothing.

61. Can radiation or radioactive material be spread from person to person?

- Radioactive material can be spread in the same way that dust or mud can be tracked into the home or by touching another person or object.
- Radiation from radioactive material or another person or surface can expose you and give you a radiation dose, even if you do not have any of the radioactive material on you.
- Neither radiation nor radioactive material is contagious like some infectious diseases.

62. What is external decontamination? How is it done?

- External decontamination is the removal of particles of radioactive material from people, clothing, pets, or objects, usually by simple washing.
    - Decontamination may be necessary after a radiological release.
    - Radioactive particles (fallout) can settle on clothes, skin, hair, buildings and objects.
- Decontaminating yourself will significantly reduce your exposure to harmful radioactive particles.
    - The longer the particles stay on your skin, the more harm they can do.
    - Decontamination may be the only step needed after a radiological emergency.
- Immediate decontamination is recommended if you or your possessions have become contaminated during a radiological emergency.
- Decontamination centers may be set up to help with decontamination and to prevent the spread of contamination.
- Follow the directions of the emergency responders to ensure effective decontamination.
- You should go to a/the reception and care center to be checked.
    - If you are found to be contaminated, you will be directed to shower, and then rechecked to be sure you are free of contamination.

63. How should people decontaminate their pets?

- Radioactive materials could contaminate both people and pets.
- Contact with and movement of contaminated animals might expose individuals and items to the contaminant.
- Seek advice from local response authorities.
- If you must decontaminate your pet, the suggested method is to:
    - Bathe your pet thoroughly with shampoo and water and rinse completely.
    - Wear waterproof gloves, an apron, and, if possible, a dust mask to protect yourself from (further) contamination, including inhaling fallout dust.
    - Follow local jurisdictional guidance on the disposal of bath water and items coming into contact with contaminants.

64. How should people decontaminate their homes and their possessions?

- You need to get information from emergency responders or local officials on whether you need to decontaminate your home and its contents.
- If you need to decontaminate your home, get guidance from emergency responders or local officials.
    - This will likely contain information on wearing protective clothing when cleaning.
    - There are likely to be special instructions for cleaning the inside and outside of your home.

APPENDIX 1: FEDERAL ROLES AND RESPONSIBILITIES IN RADIOLOGICAL EMERGENCIES

The NRF lays out in detail the role of the Federal Government in dealing with many kinds of emergencies, generally in support of local and State responders. This appendix provides a brief summary of Federal agency roles with respect to oversight of NPPs and in the event of a nuclear emergency:

- Nuclear Regulatory Commission (NRC):
  - Grants operating licenses to NPPs if they meet specified safety standards.
  - Provides assurance of the control and containment of radioactive material, under both normal and accident conditions.
  - Inspects all plants to assure they are meeting the requirements.
  - Requires numerous controls and barriers to protect workers and the public from the effects of radiation.
  - Oversees the licensee's emergency response, including its activities to end the release.
  - Notifies other agencies that can assist in the response.
  - Assists the plant in responding to significant incidents and emergencies with teams of NRC experts.

- Department of Homeland Security (DHS):
  - The Secretary of Department of Homeland Security is the principal Federal official for domestic incident management. In this role, the Secretary coordinates the federal government's resources utilized in response to or recovery from major disasters or other emergencies if and when any one of the following conditions is satisfied: (1) a federal department or agency acting under its own authority has requested the assistance of the Secretary; (2) the resources of state and local authorities are overwhelmed and federal assistance has been requested by the appropriate state and local authorities; (3) more than one federal department or agency has become substantially involved in responding to the incident; or (4) the Secretary of DHS has been directed to assume responsibility for managing the domestic incident by the President.
  - Federal Emergency Management Agency (FEMA) has primary oversight responsibility for radiological emergency planning and preparedness outside plant boundaries.
    - An adequate offsite emergency response plan in place is a condition of a plant's receiving and maintaining an operating license
  - FEMA operates the Radiological Emergency Preparedness (REP) Program to:
    - Ensure that the health and safety of residents living around commercial NPPs are adequately protected in the event of an NPP accident.
    - Inform and educate the public about REP.
  - FEMA reviews offsite agency plans and evaluates exercises held at each NPP every other year, submitting its findings to NRC.
  - FEMA becomes especially active if the President declares a disaster (emergency or major) under the Stafford Act.
  - DHS/Domestic Nuclear Detection Office (DHS/DNDO): provides radiological/nuclear detection and prevention development against terrorist activity or illicit material outside regulatory control.

  - DNDO coordinates the Global Nuclear Detection Architecture (GNDA) and implementation process.
  - Leads the Interagency Modeling and Atmospheric Assessment Center (IMAAC) to coordinate, produce and disseminate dispersion modeling and hazard prediction products that represents the federal position during an actual or potential incident to aid emergency responders in protecting the public and environment.

- Environmental Protection Agency (EPA):
  - Developed a series of Protective Action Guides (PAGs) that suggest precautions State and local authorities can take during an emergency to keep people from receiving an amount of radiation that might be dangerous to their health.
  - PAGs provide guidance only, but typically are incorporated into offsite response plans and are used as the basis for determining protective actions for both emergency responders and the general population.
  - Estimates effects of the radioactive releases on human health and the environment, and addresses non-radiological environmental hazards that may be associated with the incident.
  - Provides support to the Advisory Team for Environment, Food and Health
  - Monitors the air, precipitation, drinking water and milk across the nation for radioactive material through an environmental radiation monitoring system, RadNet.
  - Supports long-term cleanup planning, decontamination, and waste management efforts after a nuclear power plant incident.

- Department of Energy (DOE):
  - Operates the Federal Radiological Monitoring and Assessment Center (FRMAC) to coordinate all radiological measurements from various field teams.
  - Is responsible for coordinating all environmental monitoring, sampling, and assessment activities for response to a nuclear incident, available on request.
  - Also provides many other technical assistance and support functions.

- Department of Health and Human Services/Centers for Disease Control and Prevention (HHS/CDC):
  - Provides assistance to State, local and tribal public health agencies.
  - Evaluates health and medical impact on public and emergency personnel.
  - Conducts surveillance and epidemiological studies of exposed populations.
  - Deploys Strategic National Stockpile when appropriate.
  - Helps coordinate support for population monitoring.
  - Provides support to the Advisory Team for Environment, Food, and Health.

- Department of Agriculture (USDA):
  - Helps make protective action decisions regarding the handling, sheltering, and feeding of farm animals, pets, and service animals.
  - Assists in the protection of the food supply following an NPP accident.
  - Provides assistance and support to State and County agricultural agencies and Extension agents.
  - Provides support to the Advisory Team for Environment, Food, and Health

- Department of Health and Human Services/ Food and Drug Administration (HHS/FDA):
  - Provides guidance and drug information related to radiation emergencies, particularly with respect to the use of potassium iodide (KI) as a thyroid blocker.
  - Assists in the protection of the food supply.
  - Provides support/guidance to State/local authorities regarding regulated products (foods, human and animal drugs, biologics, cosmetics, etc.).
  - Provides guidance on the safety of regulated products in and near affected zones.
  - Provides support to the Advisory Team for Environment, Food and Health.

- Department of State (DOS):
  - Under an International Atomic Energy Agency (IAEA) convention, DOS provides early notification to IAEA and potentially affected countries of nuclear accidents, particularly to Canada and Mexico for incidents near their borders.

- Federal Bureau of Investigation (FBI):
  - May get involved if criminal activities occurred, are suspected, or are threatened on or near the nuclear facility.

- Department of Defense (DoD):
  - May provide specialized consequence management capabilities (personnel and equipment) in support of a validated request for assistance.
  - DoD support, other than National Guard from the respective state, is unlikely unless the situation is well beyond local/regional capabilities.

- The Regional Assistance Committee (RAC):
  - A RAC in each FEMA region, chaired by FEMA, assists State and local government officials and licensees to develop their radiological emergency plans, to review the plans, to observe exercises to evaluate the plans, and related activities.
  - RAC members may include representatives from the NRC, EPA, HHS, DOE, USDA, DOT, Commerce, and other Federal departments and agencies as appropriate.

- Department of Commerce/National Oceanic and Atmospheric Administration (NOAA):
  - Helps forecast the size and direction of radioactive air plume or ocean debris through modeling run by NOAA's Office of Oceanic and Atmospheric Research (OAR) and National Weather Service (NWS).
  - Provides special weather forecasts to the National Response Team of the incident area through NWS.
  - Assists in biological sampling and analysis of fish and shellfish in U.S. ocean waters through research ships and labs of NOAA's National Marine Fisheries Service (NMFS).
  - Has authority to close federal waters (3-200 miles from shore) to commercial fishing, and advises States to close State waters (0-3 miles) and shellfish beds.

APPENDIX 2: REFERENCES AND RESOURCES

FEDERAL REFERENCES

DHS

Nuclear Detonation Response Communications Working Group, "Nuclear Detonation Preparedness: Communicating in the Immediate Aftermath" (approved for interim use), September 2010 https://www.llis.dhs.gov/docdetails/details.do;jsessionid=D173D733995C784294DD8B045E056B07?contentID=47371

> This is a resource for Federal, State, local, tribal, and territorial officials and emergency responders who will need to communicate with the public and media following a nuclear detonation in the United States. The document includes key messages for the impacted community and the Nation, and anticipated questions and answers for the period immediately following a nuclear detonation.

Office of Public Affairs, "Emergency Support Function 15" Standard Operating Procedures, August 2009 http://www.fema.gov/pdf/emergency/nrf/ESF-15_SOP_version_19Aug2009_1330.pdf

> This is primarily a Federal tool for external affairs support to the Principal Federal Official and Joint Field Office, as well as a guiding document to coordinate overall Federal incident communications.

Domestic Nuclear Detection Office (DNDO): Nuclear Security
http://www.dhs.gov/files/programs/nuclear-security.shtm

> This link provides a summary of DNDO's activities to coordinates the Nation's efforts to prevent radiological and nuclear materials or weapons from being brought into the United States and used to attack the Nation. It links to efforts related to detection technologies, standards and evaluations, implementing detection programs, nuclear forensics, and the Global Nuclear Detection Architecture (GNDA).

DHS/FEMA

NRF Resource Center http://www.fema.gov/emergency/nrf/

> The NRF is a guide to how the Nation conducts all-hazards response – from the smallest incident to the largest catastrophe. This key document establishes a comprehensive, national, all-hazards approach to domestic incident response. The NRF identifies the key response principles, roles, and structures that organize national response. It describes how communities, States, the Federal Government, private-sector, and nongovernmental partners apply these principles for a coordinated, effective national response. The NRF Resource Center includes information about the NRF, copies of the basic document and all annexes, references, and briefing and training material.

"Overview: ESF and Support Annexes Coordinating Federal Assistance in Support of the National Response Framework" January 2008 http://www.fema.gov/pdf/emergency/nrf/nrf-overview.pdf

> This document was developed for emergency management practitioners as an overview of the process, roles, and responsibilities for requesting and providing all forms of Federal disaster assistance. This overview also presents a summary of each of the 15 ESF Annexes and 8 Support Annexes including their purpose, capabilities, membership, and concept of operations. The complete annexes are contained in the online NRF Resource Center.

"National Response Framework, Emergency Support Function #15 – External Affairs Annex" http://www.fema.gov/pdf/emergency/nrf/nrf-esf-15.pdf

This ESF ensures that sufficient Federal assets are deployed to the field during incidents requiring a coordinated Federal response to provide prompt, reliable, and actionable information to the whole community through the use of clear, consistent, accessible and culturally and linguistically appropriate methods to effectively relay information to the Whole Community. ESF #15 provides the resource support and mechanisms to implement the NRF Incident Communications Emergency Policy and Procedures (ICEPP) described in the Public Affairs Support Annex.

"National Response Framework, Nuclear/Radiological Incident Annex" June 2008 http://www.fema.gov/pdf/emergency/nrf/nrf_nuclearradiologicalincidentannex.pdf

This annex describes how the coordinating agencies and cooperating agencies support DHS's overall coordination of the response to a nuclear/radiological Incident of National Significance. In addition, this annex describes how the coordinating agencies lead the response to incidents of lesser severity.

"National Response Framework, Federal Government Partner Guide" http://www.fema.gov/pdf/emergency/nrf/PartnerGuideFederal.pdf

This Partner Guide provides a targeted index to information in the NRF core document that is specifically pertinent to Federal Government leaders and emergency management practitioners. The Guide is intended to serve as a ready reference to assist users in quickly locating sections of the NRF that are applicable to Federal partners.

(NIMS) National Incident Management System Resource Center http://www.fema.gov/emergency/nims/ NIMS provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment. The NIMS resource center includes a wide range of information about the program and copies of all NIMS documents.

"Basic Guidance for Public Information Officers (PIOs), National Incident Management System, FEMA 517," November 2007 http://www.fema.gov/library/viewRecord.do?id=3095

During an incident or planned event, coordinated and timely communication is critical to effectively help the community. Effective and accurate communication can save lives and property, and helps ensure credibility and public trust. This publication provides operational practices for performing PIO duties within the Incident Command System (ICS). It offers basic procedures to operate an effective Joint Information System (JIS) and guidance for any person or group delegated PIO responsibilities when informing the public is necessary. The guidance also addresses actions for preparedness, incident response, JICs, incident recovery, and Federal public information support. The guidance material is adaptable to individual jurisdictions and specific incident conditions.

Radiological Emergency Preparedness Program http://www.fema.gov/about/divisions/thd_repp.shtm

This link provides a summary of the REP program with links to documents, resources, training, and other related materials.

"Radiological Emergency Preparedness (REP) Program Manual" April 2012
https://www.fema.gov/library/viewRecord.do?id=5865

This manual is the principal source of policy and guidance for the FEMA REP Program. It describes the regulatory and technical basis for the program, provides guidelines for conducting exercises, and includes a variety of resource materials.

DOE

"FRMAC Operations Manual", May 2010
http://www.nv.doe.gov/library/publications/frmac/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fwww%2env%2edoe%2egov%2flibrary%2fpublications%2ffrmac%2fFRMAC%20Working%20Group%2fFRMAC%20Operations&FolderCTID=0x012000351180A087415E479639B265F9C6BEC This manual describes the FRMAC's response activities in a radiological incident and outlines how FRMAC fits into the National Incident Management System (NIMS) under the National Response Framework (NRF). It describes the federal assets and subsequent operational activities which provide federal radiological monitoring and assessment of the affected areas

EPA

Office of Radiological Programs, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," Revised 1991 http://www.epa.gov/radiation/docs/er/400-r-92-001.pdf

PAGs are values against which to compare the projected dose to an individual from a release of radioactive material at which a specific protective action to reduce or avoid that dose is warranted. The PAGs suggest precautions that State and local authorities can take during a power plant or other emergency to keep people from receiving an amount of radiation that might be dangerous to their health. The PAGs provide guidance only. This page – http://www.epa.gov/radiation/rert/pags.html – provides useful summary information.

HHS

"Nuclear Reactor Accidents" http://www.remm.nlm.gov/nuclearaccident.htm

This link outlines HHS's role and resources in the event of a nuclear accident, and includes General Information, Emergency Planning and Response, Radioisotopes in the Plume, and References.

HHS/CDC

"Emergency Preparedness and Response, Radiation Emergencies" http://emergency.cdc.gov/radiation/
see especially: Potassium Iodide (KI)

The CDC Emergency Preparedness and Response website is CDC's primary source of information and resources for preparing for and responding to public health emergencies. This site continues to keep the public informed about public health emergencies and provides the information needed to protect and save lives.

HHS/FDA

"Radiation Emergencies: Drug Information Related to Radiation Emergencies"
http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm063807.htm

Drug guidance from FDA on responding to radiation emergencies, including links to many resources on potassium iodide (KI).

NRC

"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (NUREG-0654/FEMA-REP-1, Revision 1)"
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0654/r1/ (links to the basic document, subsequent revisions, and other information).

This guidance and upgraded acceptance criteria provides a basis for NRC licensees, States, and local governments to develop radiological emergency plans and improve emergency preparedness. The guidance is the product of the joint FEMA/NRC Steering Committee established to coordinate the agencies' work in emergency preparedness associated with NPPs. This document is consistent with NRC and FEMA regulations and supersedes other previous guidance and criteria published by FEMA and NRC on this subject. It is used by reviewers in determining the adequacy of State, local, and NPP licensee emergency plans and preparedness.

Agency overview http://www.nrc.gov/

The NRC home page provides links to a wide range of information about radiation, emergency preparedness, NPPs, the Agency's regulatory and other programs, and many other related topics. The frequently asked questions page http://www.nrc.gov/reading-rm/faqlist.html provides a useful index and links.

"Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones" prepared by V.T. Covello, NUREG/CR-7033, February 2011
http://pbadupws.nrc.gov/docs/ML1104/ML110490120.pdf

This document provides guidance for NPP licensees and local response organizations on message development for radiological emergencies. Message development skills are critical to successful radiological risk communication to the public, the media, and other stakeholders. Message development skills are particularly critical to successful emergency communications with those living in close proximity to an NPP. This document contains principles, strategies, and tools for producing messages before, during, and after a radiological emergency that are understandable, timely, accurate, consistent, and credible. It contains nearly 400 questions the public and media may ask during a radiological emergency.

Emergency Preparedness and Response http://www.nrc.gov/about-nrc/emerg-preparedness.html

NRC's emergency preparedness programs enable emergency personnel to rapidly identify, evaluate, and react to a wide spectrum of emergencies, including those arising from terrorism or natural events such as hurricanes. Our incident response program integrates the overall NRC capabilities for the response and recovery of radiological incidents and emergencies involving facilities and materials regulated by the NRC or an Agreement State. Under the NRF, the NRC will coordinate with other Federal, State, and local emergency organizations in response to various types of domestic events. The NRC emphasizes the integration of safety, security, and emergency preparedness as the basis for the NRC's primary mission of protecting public health and safety.

"Developing an Emergency Risk Communication (ERC)/Joint Information Center (JIC) Plan for a Radiological Emergency," prepared by V.T. Covello, NUREG/CR-7032, February 2011
http://pbadupws.nrc.gov/docs/ML1104/ML110490119.pdf

This document provides best practices for nuclear power plant licensees and emergency response organizations on developing an Emergency Risk Communication (ERC) and JIC plan for a radiological emergency. The purpose of an ERC/JIC plan is to ensure the delivery of understandable, timely, accurate, consistent, and credible information to the public, the media, and other stakeholders during a radiological emergency.

"Effective Risk Communication: The Nuclear Regulatory Commission's Guidelines for External Risk Communication" prepared by J. Persensky, S. Browde, A. Szabo/NRC; L. Peterson, E. Specht, E. Wight/WPI (NUREG/BR-0308) http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0308/

As risk analysis becomes an important dimension of public policy, the NRC's need to improve risk communication with its internal and external stakeholders is also increasing. Risk communication provides the essential links between risk analysis, risk management, and the public. A primary challenge to effective risk communications is the conflict caused by the difference between how the NRC and the public define or perceive risk. The NRC's assessment of risk balances the likelihood of an occurrence against its possible consequences. The public's perception of risk, however, is based on the probability that something bad will happen to them, compounded by aspects of the situation that upset them.

"Effective Risk Communication: The Nuclear Regulatory Commission's Guidelines for Internal Risk Communication" prepared by A. Szabo, J. Persensky/NRC; L. Peterson, E. Specht, N. Goodman, R. Black/WPI (NUREG/BR-0318), December 2004 http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0318/guidance/index.html

This document presents practical, how-to guidelines for management and staff of the NRC to use in communicating risk-related information to others within the Agency. Research and experience show that effective risk communication depends on such key factors as understanding your stakeholders, establishing trust and credibility, clearly presenting your key messages, providing forums for discussion and deliberation, and using listening skills. In addressing these factors, these guidelines demonstrate how NRC management and staff should apply each technique to internal communication about risk-related information and the NRC's risk-informed, performance-based regulatory approach.

NSS

National Security Staff Interagency Policy Coordination Subcommittee for Preparedness & Response to Radiological and Nuclear Threats, "Planning Guidance for Response to a Nuclear Detonation," Second Edition, June 2010
http://www.hps.org/hsc/documents/Planning_Guidance_for_Response_to_a_Nuclear_Detonation-2nd_Edition_FINAL.pdf

This guidance provides emergency planners with nuclear detonation-specific response recommendations to maximize the preservation of life in the event of an urban nuclear detonation. This guidance addresses the unique effects and impacts of a nuclear detonation such as scale of destruction, shelter and evacuation strategies, unparalleled medical demands, management of nuclear casualties, and radiation dose management concepts. The guidance is aimed at response activities in an environment with a severely compromised infrastructure for the first few days when it is likely that many Federal resources will still be en route to the incident. The target audiences for the guidance are response planners and their leadership. Emergency responders should also benefit in understanding and applying this guidance. In this second edition a chapter has been added to address public preparedness and emergency public communications, among other changes.

USDA

National Agricultural Library, "Emergency Preparedness and Management"
http://riley.nal.usda.gov/nal_display/index.php?info_center=1&tax_level=1&tax_subject=609

This link provides educational tools and resources for emergency preparedness and management due to natural or man-made disasters for the food and agricultural sector.

NON-FEDERAL REFERENCES

Conference of Radiation Control Program Directors (CRCPD) http://www.crcpd.org

The CRCPD is a nonprofit non-governmental professional organization dedicated to radiation protection. Its mission is "to promote consistency in addressing and resolving radiation protection issues, to encourage high standards of quality in radiation protection programs, and to provide leadership in radiation safety and education." The primary membership of the CRCPD includes radiation professionals in State and local government that regulate the use of radiation sources.

International Atomic Energy Agency, "Prepare and Respond" http://www-ns.iaea.org/tech-areas/emergency/default.asp?s=1&l=5

IAEA's Incident and Emergency Centre (IEC) is the global focal point for international preparedness and response to nuclear and radiological safety or security related incidents, emergencies, threats, or events of media interest. This page provides information on emergency preparedness, the international response system, and updates on the incident on the Fukushima plant incident. Another page –http://www-ns.iaea.org/conventions/emergency.asp?s=6#2 – provides information on the Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency and the Convention on Early Notification of a Nuclear Accident.

APPENDIX 3: ABBREVIATIONS AND ACRONYMS

A&N	Alert and Notification
ACF	Administration for Children and Families
ACP	Access Control Point
ADA	Americans with Disabilities Act
AEC	U.S. Atomic Energy Commission
ALARA	As Low as Reasonably Achievable
AMS	Aerial Measuring System
ANI	American Nuclear Insurers
ANS	Alert and Notification System
AOA	Administration on Aging
ARC	American Red Cross
ARG	Accident Response Group
ASPECT	Airborne Spectral Photometric Environmental Collection Technology
ASPR	Assistant Secretary for Preparedness & Response
ARS	Acute Radiation Syndrome/Sickness
ATSDR	Agency for Toxic Substances and Disease Registry
Bq	Bequerel
BWR	Boiling Water Reactor
CCC	Congregate Care Center
CDC	U.S. Centers for Disease Control and Prevention (HHS)
CDE	Committed Dose Equivalent
CEDE	Committed Effective Dose Equivalent
CEMP	Comprehensive Emergency Management Plan
CFA	Cognizant Federal Agency
CFAO	Cognizant Federal Agency Official
CI	Critical Infrastructure
Ci	Curie (1 Ci = 3.7 x 10^{10} Bq)
CMAT	Consequence Management Environmental Response Team
CMHT	Consequence Management Home Team
CPG	Comprehensive Preparedness Guide
CRCPD	Conference of Radiation Control Program Directors
DAC	Disaster Application Center
DECON	Decontamination
DFO	Disaster Field Office
DHS	U.S. Department of Homeland Security
DNA	U.S. Defense Nuclear Agency
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOH	U.S. Department of Health
DOI	U.S. Department of the Interior
DOL	U.S. Department of Labor
DOS	U.S. Department of State
DOT	U.S. Department of Transportation
DRA	Disabilities-Related Assistance
DRD	Direct-Reading Dosimeter
DRP	Division of Radiation Protection (DOH Division)
DRSS	Division of Radiation Safety and Safeguards
DSO	Director of Site Operations (NRC)
E 911	Enhanced 9-1-1
EACT	Emergency Action Coordinating Team
EAL	Emergency Action Level
EAS	Emergency Alert System [formerly Emergency Broadcast System (EBS)]
EBS	Emergency Broadcast System [replaced by the EAS]
ECL	Emergency Classification Level
EDE	Effective Dose Equivalent
EICC	Emergency Information and Coordination Center (FEMA)
EIS	Emergency Information System
EM	Emergency Management
EMPO	Emergency Medical Preparedness Office
EMS	Emergency Medical Service
EOC	Emergency Operations/Operating Center (State, tribal, or local government)
EOF	Emergency Operations/Operating Facility (utility)
EOP	Emergency Operations/Operating Plan or Procedure

EPA U.S. Environmental Protection Agency
EPD Electronic Personnel Dosimeter
EPO Environmental Protection Officer
EPZ Emergency Planning Zone
ERC Emergency Risk Communication
ERPA Emergency Response Planning Area
ERPG Emergency Response Guidelines
ERT Emergency Response Team
ERT-A Emergency Response Team—Advance
ESF Emergency Support Function
EST Emergency Support Team (FEMA)
ETE Evacuation Time Estimate
ETS Evacuation Time Study
EW Emergency Worker
EWAC Emergency Worker and Assistance Center
EWC Emergency Worker Center
EWMDS Emergency Worker Monitoring and Decontamination Station

FAA Federal Aviation Administration
FAQ Frequently Asked Question
FBI Federal Bureau of Investigation
FCC U.S. Federal Communications Commission
FCO Federal Coordinating Officer
FCP Forward Command Post
FDA U.S. Food & Drug Administration
FECC Federal Emergency Communications Coordinator
FEMA Federal Emergency Management Agency
FERN Food Emergency Response Network
FMT Field Monitoring Team
FNF Fixed Nuclear Facility
FNSS Functional Needs Support Services
FOC Federal Operations Center
FPC Federal Preparedness Coordinator
FRC Federal Regional Center
FRC Federal Response Center
FRMAC Federal Radiological Monitoring and Assessment Center
FRMAP Federal Radiological Monitoring and Assistance Plan
FRMT Field Radiological Monitoring Team
FRPCC Federal Radiological Preparedness Coordinating Committee
FRSSB Facilities Radiological Safety and Safeguards Branch
FSA Forward Staging Area
FSAR Final Safety Analysis Report
FTC Field Team Coordinator
FTS Federal Telecommunications System

GE General Emergency
G-M Geiger-Mueller (radiation detector)
GNDA Global Nuclear Detection Architecture
GSA U.S. General Services Administration
Gy Gray

HAZMAT Hazardous Material
HEAR Hospital Emergency Administrative Radio
HEPA High-Efficiency Particulate Air (filters)
HHS U.S. Department of Health and Human Services
HOO Headquarters Operations Officer (NRC)
HP Health Physicist
HQ Headquarters
HSPD Homeland Security Presidential Directive
HUD U.S. Department of Housing and Urban Development

I Iodine
IAEA International Atomic Energy Agency
IC Incident Commander
ICP Incident Command Post
ICPACC Incident Communications Public Affairs Coordination Committee
ICS Incident Command System
IEP Ingestion Exposure Pathway
IMAAC Interagency Modeling and Atmospheric Assessment Center
IP Implementing Procedure
IP Improvement Plan
IRAC Interagency Radiological Assistance Committee
IRZ Immediate Response Zone
ISCORS Interagency Steering Committee on Radiation Standards

JIC Joint Information Center
JIS Joint Information System
JNC Joint News Center
JOC Joint Operations Center
JPIC Joint Public Information Center

KI Potassium Iodide
KR Key Resource

LAO Lead Agency Official
LEPC Local Emergency Planning Committee
LERN Law Enforcement Radio Net
LFA Lead Federal Agency
LLEA Local Law Enforcement Agency
LOA Letter of Agreement
LOCA Loss of Coolant Accident
LWR Light Water Reactor

MERRT Medical Emergency Radiological Response Team
MERS Mobile Emergency Response Support
MET Meteorological
MHz Megahertz
MIC Media Information Center
MOU Memorandum of Understanding
MPC Maximum Permissible Concentration
mR Milliroentgen
mR/h Milliroentgen per hour
mrem Millirem
MRV Mobile Response Vehicle
mSv Millisievert
MUDAC Meteorological and Unified Dose Assessment Center
MW Megawatt
MWH Megawatt Hour
µCi Microcuries
uSv Microsievert

NAAQS National Ambient Air Quality Standards
NAERG North American Emergency Response Guidebook
NARAC National Atmospheric Release Advisory Center (DOE)
NARP Nuclear Accident Response Plan (or Procedures)
NASA National Aeronautics and Space Administration
NAWAS National Warning System
NCC National Coordinating Center for Telecommunications
NCP National Contingency Plan
NCRP National Council on Radiation Protection and Measurements
NCS National Communications System
NDA National Defense Area
NEI Nuclear Energy Institute
NEMA National Emergency Management Association
NFPA National Fire Protection Association
NGO Non-Governmental Organization
NICCL National Incident Communications Conference Line
NIFC National Interagency Fire Center
NIMS National Incident Management System
NIOSH U.S. National Institute for Occupational Safety and Health
NIST U.S. National Institute of Standards & Technology [formerly National Bureau of Standards (NBS)]
NIT Nuclear Incident Team (DOE)
NJIC National Joint Information Center
NMSS Nuclear Materials Safeguards and Security
NOAA U.S. National Oceanic and Atmospheric Administration
NOUE Notification of Unusual Event
NPD National Preparedness Directorate
NPP Nuclear Power Plant
NPS U.S. National Park Service
NRC U.S. Nuclear Regulatory Commission
NRF National Response Framework
NRIA Nuclear/Radiological Incident Annex (NRF)
NRT National Response Team
NSA National Security Area
NTSB U.S. National Transportation Safety Board
NUMARC Nuclear Management and Resources Council
NUREG Nuclear Regulation (NRC Documents Reference)
NWS U.S. National Weather Service

OAR Office of Oceanic and Atmospheric Research
OCRWM Office of Civilian Radioactive Waste Management
OEM Office of Emergency Management
OMB Office of Management and Budget
ORIA Office of Radiation and Indoor Air (EPA)
ORO Offsite Response Organization

OSC Operational Support Center
OSC On-Scene Coordinator/Commander
OSHA U.S. Occupational Safety and Health Administration
OST Office Support Team

PA Public Address
PA Public Affairs
PAs Protective Actions
PAD Protective Action Decision
PAG Protective Action Guide
PAO Public Affairs Officer
PAR Protective Action Recommendation
PAZ Protective Action Zone
PEL Permissible Exposure Limit
PFO Principal Federal Official
PHS Public Health Service
PICCL Private Sector Incident Communications Coordination Line
PIO Public Information Officer
PPE Personal Protective Equipment
ppm Parts per Million
PRD Permanent Record Dosimeter
PWR Pressurized Water Reactor
PZ Precautionary Zone

R Roentgen
R/h Roentgens per hour
Ra Radium
RA Regional Administrator
RAC Regional Assistance Committee
RAC AC Regional Assistance Committee Advisory Council
RACES Radio Amateur Civil Emergency Services
RAD Radiation Absorbed Dose
RADLAB Radiological Laboratory
RAM Radioactive Material
RAP Radiological Assistance Program (DOE)
RASCAL Radiological Assessment System for Consequence Analysis
RC Reception/Relocation Center
RCC Reception and Congregate Care
RCS Reactor Coolant System
RCT Response Coordination Team
RDO Radiological Defense Officer
RDO Regional Duty Officer
REA Radioactive Emergency Area
REDAM Radiological Emergency Dose Assessment Model
REL Recommended Exposure Limit
REM Roentgen Equivalent Man/Mammal
REP Radiological Emergency Preparedness
RERO Radiological Emergency Response Operations
RERP Radiological Emergency Response Plan
RERT Radiological Emergency Response Team
RF Radio Frequency
R/h Roentgens per hour
RM Radiological Monitor
RMT Radiological Monitoring Team
RO Radiological Officer
ROST Regional Office Support Team
RPT Radiation Protection Technician
RRAC Regional Radiological Assistance Committee
RRCC Regional Response Coordination Center
RRF Regional Response Force
RRT Radiological Response Team
RRT Regional Response Team

SAE Site Area Emergency
SARA Superfund Amendments and Reauthorization Act of 1986
SAV Staff Assistance Visit
SBA U.S. Small Business Administration
SCO State Coordinating Officer
SEOC State Emergency Operations Center
SFO Senior FEMA Official
SICCL State Incident Communications Coordination Line
SOG Standard Operating Guidelines
SRD Self-Reading Dosimeter
SRF Service or Agency Response Force
SWAT Special Weapons and Tactics
Sv Sievert

TAR Tone-Alert Radio
TBA Thyroid Blocking Agent (see KI)
TCP Traffic Control Point
TDD Telecommunications Device for the Deaf
TEDE Total Effective Dose Equivalent
TL Team Leader
TLD Thermoluminescent Dosimeter
TSC Technical Support Center
TSP Total Suspended Particulates

US&R Urban Search & Rescue
USACE U.S. Army Corps of Engineers
USCG U.S. Coast Guard
USDA U.S. Department of Agriculture

VA U.S. Veterans Administration
VOAD Voluntary Organization Active in Disaster

WHO World Health Organization
WP Warning Point

APPENDIX 4: GLOSSARY OF NUCLEAR POWER PLANT EMERGENCY TERMS

This glossary covers basic terms likely to be of interest to senior officials addressing a nuclear power plant emergency. The full list of terms can be found at: FEMA, Program Manual, Radiological Emergency Preparedness (October 2011).

Access control: all activities accomplished for the purpose of controlling entry or reentry into an area that has either been evacuated or is under a sheltering protective action decision to minimize the radiation exposure of individuals because of radiological contamination. This function is needed to prevent the general public from entering restricted areas (sheltered and/or evacuated) and permitting only emergency workers with essential missions and limited members of the general public to enter.

Activated: an EOC or other facility is considered activated as soon as notification of an incident is received and the Director/Commissioner/responsible representative makes the determination to activate the facility. The facility is not considered *operational* until it is ready to carry out full emergency operations with key decision makers in place.

Activation of personnel: the process by which emergency response personnel are notified of an incident and instructed to report for duty.

Acute exposure: an exposure to radiation that occurs over a short period of time, usually less than an hour.

Advisory Team for Environment, Food and Health (Advisory Team): a group consisting of members from the EPA, USDA, FDA, and CDC which develops coordinated advice and recommendations on environmental, food, health, and animal health matters for the coordinating agency, State, local, and tribal governments, and others as appropriate.

Aerial Measuring System (AMS): DOE asset that performs remote sensing from aerial platforms to rapidly characterize large areas of ground-deposited radiation. These platforms include fixed-wing and rotary-wing aircraft with radiological measuring equipment. Measurements are analyzed and assessed to inform protective action decisions.

Airborne radioactivity: any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors, or gases.

Airborne Spectral Photometric Environmental Collection Technology (ASPECT): EPA's aircraft offers gamma emission screening and mapping, chemical detection and characterization, Geo-tracking, and video and imaging capabilities**.**

ALARA: acronym meaning "as low as reasonably achievable."

Alert: licensee emergency classification level indicating that events are in process or have occurred that involve an actual or potential substantial degradation in the level of plant safety or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Releases are expected to be limited to small fractions of the EPA PAG exposure levels.

Alerting of personnel: transmission of a signal or message notifying personnel about the development of an incident that may require reporting for emergency duty.

Alerting the public: activating an attention getting warning signal through such means as

sirens, tone alert radios, route alerting, and speakers on cars, helicopters, and boats.

Alert system: the hardware system(s) used to get the attention of the public within the plume emergency planning zone. An alert system may include a combination of sirens; tone activated radios; vehicles (including boats and airplanes) that utilize loud speakers/sirens, and other equipment that provides an alert signal (including considerations for the hearing impaired).

Alpha particle (alpha radiation): a positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of 4 and an electrostatic charge of plus 2. It has low penetrating power and short range. The most energetic alpha particle will generally fail to penetrate the skin. Alpha is hazardous when an alpha-emitting isotope is introduced into the body. Alpha particles are the least penetrating of the three common types of radiation (alpha, beta, and gamma) and can be stopped by a piece of paper (cannot penetrate skin).

Assessment: the evaluation and interpretation of radiological measurements and other information to provide a basis for decision making. Assessments can include projections of offsite radiological impact.

Atomic energy: energy released in nuclear reactions, more appropriately called "nuclear energy." Of particular interest is the energy released when a neutron initiates the breaking up or fissioning of an atom's nucleus into smaller pieces (fission), or when two nuclei are joined together under millions of degrees of heat (fusion).

Background radiation: the level of naturally occurring radiation in the environment. Sources include air, water, soil, potassium-40 in the body, medical, and galactic cosmic and solar radiation. The usually quoted individual radiation annual exposure is an average of approximately 620 millirem per year.

Becquerel (Bq): the basic unit to describe the intensity of radioactivity in a sample of material. One Bq is equal to one disintegration (nuclear transformations) per second. Several commonly used multiples of the Bq include:

kilobequerel: thousand bequerels, abbreviated kBq)
megabequerel: million bequerels, abbreviated MBq)
gigabequerel: billion bequerels, abbreviated GBq)
terabequerel: trillion bequerels, abbreviated TBq)
petabequerel: quadrillion bequerels, abbreviated PBq)

Beta particle (beta radiation): a charged particle emitted from a nucleus during radioactive decay, with a mass equal to 1/1827 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Large amounts of beta radiation may cause skin burns, and beta emitters are harmful if they enter the body. Most beta particles can be stopped by aluminum foil.

Boiling water reactor (BWR): a light water reactor design used in some nuclear power stations. It has many similarities to the pressurized water reactor, except that in a BWR the steam going to the turbine is produced in the reactor core rather than in a steam generator or heat exchanger. In a BWR there is only a single circuit in which the water is at lower pressure than in a PWR (about 75 times atmospheric pressure) so that it boils in the core at about 285°C. The reactor is designed to operate with 12-15% of the water in the top part of the core as steam, resulting in less moderation, lower neutron efficiency and lower power density than in the bottom part of the core.

Buffer zone: an area adjacent to a restricted zone, to which residents may return, but for which protective measures are recommended to minimize exposure to radiation.

Chronic exposure: exposure to small doses of radiation over an extended period of time.

Commercial nuclear power plant (NPP): facility licensed by the NRC to use a nuclear reactor to produce electricity for sale to the general public.

Committed dose: the dose that will be received over a period of 50 years from the ingestion or inhalation of a particular quantity of a radionuclide or a specific mix of radionuclides.

Committed dose equivalent (CDE): the dose equivalent to an organ or tissue that will be received from an intake of radioactive material by an individual during the 50-year period following inhalation (or ingestion).

Committed effective dose equivalent (CEDE): the sum of the 50-year (NRC) or 70-year (EPA) committed doses equivalent to individual organs from inhalation (or ingestion) of radionuclides, where the individual organ doses equivalent have been appropriately weighted prior to summing so that the associated risk of fatal cancer can be compared to the risk of fatal cancer from a whole-body dose.

Congregate care center (CCC): a facility for temporary housing, care, and feeding of evacuees.

Containment: the provision of a gas-tight shell or other enclosure around a reactor that confines fission products and prevents their release to the environment in an accident.

Contaminated: the condition resulting from the adhesion of radioactive particulates to the surface of structures, areas, objects, or personnel.

Contaminated injured individuals: individuals who are: (1) contaminated with radioactive material that cannot be removed by the simple methods described in NUREG-0654/FEMAREP- 1, Evaluation Criteria J.12 and K.5.b; or (2) contaminated and otherwise physically injured. Individuals exposed to high levels of radiation may be injured but not contaminated.

Contamination: refers to radioactive materials not in their intended containers. Whether the contamination is considered "fixed" or "loose" depends on the degree of effort required to unfix or remove the contamination from a surface.

Control rod: a rod containing a material that readily absorbs neutrons (such as boron). It is used to control the power of a nuclear reactor. By absorbing neutrons, a control rod slows the fission chain reaction by preventing neutrons from causing further fission.

Controlled area: a defined area in which the occupational exposure of personnel to radiation or radioactive material is under the supervision of an individual in charge of radiation protection.

Coolant: a substance, usually water, circulated through a nuclear reactor to remove or transfer heat.

Cool down: the gradual decrease in reactor fuel rod temperature caused by the removal of heat from the reactor coolant system.

Core: the central portion of a nuclear reactor containing the fuel elements, moderator, neutron poisons, and support structures.

Core melt accident: a reactor accident in which the fuel core melts because of overheating.

Cumulative dose (radiation): the total dose resulting from repeated exposure to radiation of the same body region, or of the whole body.

curie (Ci): a basic unit to describe the intensity of radioactivity in a sample of material. One curie is equal to 37 billion disintegrations (nuclear transformations) per second, or 37 billion bequerels. So, in one curie, 37 billion atoms decay in one second. Several commonly used fractions of the curie include:

millicurie: 1/1,000 of a curie, (one thousandth of a curie, abbreviated mCi)
microcurie: 1/1,000,000 of a curie, (one millionth of a curie, abbreviated μCi)
nanocurie: 1/1,000,000,000 of a curie, (one billionth of a curie, abbreviated nCi)

picocurie: 1/1,000,000,000,000 of a curie (one trillionth of a curie, abbreviated pCi)

Decontamination: the process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing chemical or biological agents, or by removing radioactive material clinging to or around it.

Decontamination station: a building or location suitably equipped and organized where personnel and material are cleansed of chemical, biological, or radiological contaminants.

Direction and control: the management of emergency functions within a particular context (e.g., an emergency operations center) through leadership and use of authority.

Direct-reading dosimeter (DRD): a small ionization detection instrument that indicates radiation exposure directly. An auxiliary charging device is usually necessary. DRDs can be read in real time by the user. A DRD is also referred to as a "pocket dosimeter."

Dose: the quantity of energy absorbed from ionization per unit mass of tissue. The rad is the unit of absorbed dose.

Dose equivalent: The product of the absorbed dose in rad and a quality factor related to the biological effectiveness of the radiation involved. The rem is the unit of dose equivalent.

Dose limits for emergency workers: the allowable accumulated dose during the entire period of the emergency. Action to avoid exceeding the limit is taken based on actual measurements of integrated gamma exposure. In contrast, protective action guides are trigger/action levels of projected dose at which actions are taken to protect the public. These actions are taken prior to the dose being received.

Dose rate: the radiation dose delivered per unit time. The dose rate may be expressed numerically in rads per second or rads per hour.

Dosimeter: a portable device such as a thermoluminescent film badge or direct-reading ionization chamber used for measuring and registering the total accumulated exposure to ionizing radiation. Thermoluminescent dosimeters (TLD) and optically-stimulated luminescence (OSL) dosimeters are types of dosimeters that collect field data for processing at a remote location.

Dosimetry: the measurement of radiation doses. It applies to both the devices used (dosimeters) and to the techniques.

Drill: an event involving organizational responses to a simulated accident to develop, test, and monitor specialized emergency skills that constitute one or more components of emergency plans/procedures.

Early phase: (also referred to as the plume or emergency phase) the period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must therefore usually be based primarily on the status of the nuclear power plant and the prognosis for worsening conditions. When available, predictions of radiological conditions in the environment based on the condition of the source or actual environmental measurements may also be used. Precautionary actions may precede protective actions based on the protective action guides. This phase lasts hours to several days and ends when the radioactive release ends.

Effective dose equivalent (EDE): the sum of the products of the dose equivalent to each organ and a tissue weighting factor, where the tissue weighting factor is the ratio of the risk of mortality from delayed health effects arising from irradiation of a particular organ or tissue to the total risk of mortality from delayed health effects when the whole body is irradiated uniformly to the same dose.

Emergency: an unexpected event during the operation of a nuclear power plant that has a significant effect on the safety of the facility, personnel or the public.

Emergency Action and Coordination Team (EACT): the DOE senior management team at DOE headquarters that coordinates the initial NRF response to a radiological emergency.

Emergency Alert System (EAS): a system of radio and television stations responsible for providing official government instructions to the public (formerly the Emergency Broadcast System).

Emergency Classification Level (ECL): classifications used by the licensee to classify incidents. In increasing order of severity, the four ECLs are Notification of Unusual Event (NOUE), Alert, Site Area Emergency (SAE), and General Emergency (GE).

Emergency Information and Coordination Center (EICC): the FEMA 24-hour national emergency center from which the Emergency Support Team operates. Emergency Information and Coordination Center communications link the Senior Federal Official, FEMA Regional and headquarters staff, and other Federal departments and agencies at the national level with one another.

Emergency information: material designed to improve public knowledge or understanding of an emergency.

Emergency instructions: information provided to the general public during an emergency pertaining to protective action recommendations for actions such as evacuation and sheltering.

Emergency Operations Facility (EOF): a facility that is the primary base of emergency operations for the Licensee in a radiological incident. An onsite operations facility provided by the NRC Licensee to facilitate the management of an overall emergency response. Utility and State officials, and a very limited number of Federal personnel may be accommodated.

Emergency Operations Center (EOC): a facility that is the primary base of emergency operations for an offsite response organization in a radiological emergency.

Emergency phase: see "early phase."

Emergency Planning Zone (EPZ): a geographic area surrounding a commercial nuclear power plant for which emergency planning is needed to ensure that prompt and effective actions can be taken by offsite response organizations to protect the public health and safety in the event of a radiological accident. The plume pathway EPZ is approximately 10 miles in radius, while the ingestion pathway EPZ has a radius of approximately 50 miles.

Emergency protective actions: protective actions to isolate food to prevent its introduction into commerce and to determine whether condemnation or other disposition is appropriate.

Emergency response planning area: see "planning area."

Emergency Support Team (EST): the FEMA Headquarters' team that carries out notification, activation, and coordination procedures from the FEMA Emergency Information and Coordination Center. The EST is responsible for Federal agency headquarters coordination, staff support of the FEMA Administrator, and support of the Senior Federal Official.

Emergency worker (EW): individual who has an essential mission to protect the health and safety of the public who could be exposed to ionizing radiation from the plume or from its deposition. Some examples of emergency workers are: radiation monitoring personnel; traffic control personnel; fire and rescue personnel, including ambulance crews; medical facilities personnel; emergency operations center personnel; personnel carrying out route alerting procedures; and essential services or utility personnel; and evacuation vehicle (e.g., bus, van, etc.) drivers. Note that evacuation vehicle drivers who will be transporting individuals or groups out of the EPZ and who are not expected to return to the emergency planning zone are not considered "Emergency Workers."

Essential emergency functions: these include communications, direction and control of

operations, alert and notification of the public, accident assessment, information for the public and media, radiological monitoring, protective response, and medical and public health support.

Evacuation (Resident Evacuation): a population protection strategy involving orderly movement of people away from an actual or potential hazard, and providing reception centers for those without their own resources for temporary relocation.

Exclusion area: the area surrounding a nuclear reactor in which the facility operator has the authority to determine all activities, including exclusion or removal of personnel and property from the area. A specific area off-limits (expressed in miles) from an NPP.

Exercise: see Radiological Emergency Preparedness (REP) Exercise.

Exposure: the absorption of radiation or ingestion of a radionuclide. The exposure at a given point is a measurement of radiation in relation to its ability to produce ionization. The unit of measurement of the exposure is the roentgen. A measure of radiation dose received by a person, usually broken down and used to refer to whole-body exposure compared with exposure to the hands only.

Exposure rate: the amount of energy from gamma or x-ray radiation transferred in a standard volume of air (expressed in units of microRoentgen per hour µR/hr, milliRoentgen per hour (mR/hr), Roentgen per hour (R/hr), etc.).

Facility: any building, center, room(s), or mobile unit(s) designed and equipped to support emergency operations.

Federal or other support organizations: Federal agencies such as FEMA, DOE, the NRC, or any other governmental, quasi-governmental, or private organizations (e.g., American Red Cross, Civil Air Patrol, Amateur Radio Emergency Services, and Radio Amateur Civil Emergency Services, cooperating state compact radiological monitoring or sampling personnel, and national or university laboratories) that may provide assistance in radiological emergencies.

Federal Coordinating Officer (FCO): the Federal official appointed by the President upon declaration of a major disaster or emergency under Public Law 93-288 to coordinate the overall Federal response.

Federal Emergency Management Agency (FEMA): the agency responsible for establishing Federal policies for and coordinating all civil defense and civil emergency planning, management, mitigation, and assistance functions of executive agencies. FEMA assists State, local, and tribal agencies in their emergency planning. Its primary role is one of coordinating Federal, State, local, tribal, and volunteer response actions.

Federal Radiological Monitoring and Assessment Center (FRMAC): a center usually located at a facility near the scene of a radiological emergency from which the FRMAC Manager conducts the NRF response. This center need not be located near the onsite or Federal-State operations centers as long as its operations can be coordinated with them.

Federal Radiological Preparedness Coordinating Committee (FRPCC): the national level coordination mechanism to provide technical assistance to offsite response organizations (see 44 CFR Part 35l).

Federal Response Center (FRC): the on-scene focal point established by the Senior FEMA Official, as required, for coordinating the Federal response to an incident. Representatives of other Federal, State, local, tribal, and volunteer agencies will be located in the center.

Film badge: a photographic film packet to be carried by personnel, usually in the form of a badge, used for measuring and permanently recording gamma ray dosage. A thermoluminescent dosimeter is a type of film badge.

Field Monitoring Team (FMT): includes groups used to detect and monitor radiation in the environment (e.g., measuring the concentration of radiation in the air, water, vegetation, soil, etc.).

Fixed Nuclear Facility (FNF): a stationary nuclear installation that uses or produces radioactive materials in its normal operations. Fixed nuclear facilities include commercial NPPs and other fixed facilities.

Food chain: the pathway of any material through the environment to edible plants, animals and ultimately to humans.

Forward Emergency Operations Center: if the State EOC is a significant distance from the plant site, the plans/procedures may indicate that a near-site or forward emergency operations center will be established at the time of an accident.

Forward Command Post (FCP): a location near the affected area used to direct the activities of state field personnel performing emergency tasks in support of local government response. This location may also be used for location for field team coordination.

Forward Operations Post: a location in or near the affected area used to coordinate the monitoring and sampling activities of the Radiological Emergency Response Teams.

Forward Staging Area (FSA): location near the incident site for collection and preparation of resources for deployment.

Fuel cycle: the series of steps involved in supplying fuel for nuclear power reactors. It includes mining, fabrication of fuel elements and assemblies, their use in a reactor, reprocessing spent fuel and refabrication into new fuel elements.

Fuel element: a rod or other form into which nuclear fuel is fabricated for use in a nuclear reactor.

Gamma rays (gamma radiation): the most penetrating of the three types of ionizing radiation, gamma rays are electromagnetic radiation like light, radio waves and microwaves. Similar to X-rays, but usually more powerful, they have no mass; they are only energy. Gamma rays are best stopped or shielded against by dense material such as concrete or lead.

Geiger-Mueller (G-M) detector: a type of radiation detector that can be used to measure the gamma, or beta plus gamma radiation depending on whether the detector is covered by a beta shield.

General Emergency (GE): the most serious of the four licensee emergency classification levels indicating that events are in process or have occurred that involve actual or imminent substantial core degradation or melting, with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can reasonably be expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Gray (Gy): the world standard unit of radiation dose or energy absorbed per unit tissue mass. One Gray is equal to 1 joule per kilogram or 100 rads.

Half-life: the time required for the activity of a given radioactive substance to decrease to half of its initial value due to radioactive decay. The half-life is a characteristic property of each radioactive species and is independent of its amount or condition. The effective half-life of a given isotope on the body is the time in which the quantity in the body will decrease to half as a result of both radioactive decay and biological elimination. Half-lives vary from millionths of a second to billions of years.

High exposure rate: an exposure rate greater than 2.5 milliroentgens per hour.

High levels of radiation dose equivalent: doses of 100 rem or greater annually.

Host/support jurisdiction: a geographical area that is at least 5 miles, and preferably 10 miles, beyond the boundaries of the 10-mile plume pathway emergency planning zone (i.e., 15-20 miles from the commercial nuclear power plant) where functions such as congregate care, radiological monitoring, decontamination, and registration are conducted.

Hostile action: as defined in NRC Bulletin 2005-02, *Emergency Preparedness and Response Actions for Security-Based Events*, a hostile action is "an act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force."

Hot spot: region in a contaminated area in which the level of radioactive contamination is considerably greater than in neighboring regions.

Implementing procedure: instructions used by personnel that provide a detailed description, including checklists, of the operations that are to be conducted by either a specific group of individuals or a designated position. Implementing procedures are also referred to as standard operating guidelines.

Incident: an occurrence, natural or man-made, that requires a response to protect life or property. Incidents can include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, tsunamis, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response.

Incident Command Post (ICP): the field location where the primary response functions are coordinated. The ICP may be co-located with other incident facilities.

Incident Command System (ICS): a standardized management tool for meeting the demands of small or large emergency or nonemergency situations.

Ingestion Exposure Pathway Emergency Planning Zone (EPZ): a geographic area, approximately 50 miles in radius surrounding a commercial NPP, in which it has been estimated that the health and safety of the general public could be adversely affected through the ingestion of water or food which has been contaminated through exposure to radiation primarily from the deposition of radioisotopes after a radiological accident. The duration of such exposures could range in length from hours to months.

Institutionalized individuals: individuals who reside in institutions, such as nursing homes or correctional facilities, who may need to depend on others for assistance with protective actions. Institutionalized individuals may or may not have disabilities and access/functional needs.

Intermediate phase: the period beginning after the utility has verified that the release has been terminated. Reliable environmental measurements are available for use as a basis for decisions on additional protective actions. It extends until these additional protective actions are terminated. This phase may overlap the late phase and may last from weeks to many months. The intermediate phase encompasses REP postplume activities associated with both ingestion and relocation.

Internal contamination: radioactive material inside the body. Some examples are iodine-131 that seeks the thyroid gland, cesium-137 that seeks muscle, and strontium-90 that seeks the bone.

Iodine (I): an element of the periodic table. Only one stable isotope exists, the rest are radioactive and artificially created. Several iodine isotopes can be released to the environment during and NPP accident. Iodine-131 generally is of most concern, while iodine-129 has the longest radioactive half-life. The most common, iodine-131 and iodine-125, are

used for medical treatment of the thyroid gland and in research.

Ionization: the process of adding or removing electrons from atoms or molecules, thereby creating ions. High temperatures, electrical discharges, or nuclear radiation can cause ionization.

Ionizing radiation: any radiation that displaces electrons from atoms or molecules, thereby producing ions. Alpha, beta, and gamma radiation are examples. Ionizing radiation may damage skin and tissue.

Isotope: nuclides having the same number of protons in their nuclei and the same atomic number, but differing in the number of neutrons and atomic mass number. Some isotopes of a particular element may be radioactive while the others are not.

Joint Information Center (JIC): a central point of contact for all news media at the scene of the incident. News media representatives are kept informed of activities and events via public information officials from all participating Federal, State, and local agencies, which are ideally collocated at the JIC.

Joint Information System (JIS): Joint Information System (JIS): a structure that integrates incident information and public affairs into a cohesive organization designed to provide consistent, coordinated, accurate, accessible (for both individuals with disabilities and populations with limited English proficiency), timely, and complete information during a crisis or incident operations.

Key staff: those emergency personnel, sufficient in numbers and functions, necessary to carry out emergency operations as set forth in the plans/procedures.

KI (potassium iodide): see potassium iodide.

Late phase: the period beginning when recovery action designed to reduce radiation levels in the environment to acceptable levels for unrestricted use are commenced, and ending when all recovery actions have been completed. This period may extend from months to years. REP post-plume activities associated with return and recovery occur during the late phase.

Lead Agency Official (LAO): the designated official on scene from each participating Federal agency authorized to direct that agency's response.

Licensee: the utility or organization that has applied for or has received from the NRC (1) a license to construct or operate a commercial NPP, (2) a possession-only license for a commercial NPP, with the exception of licensees that have received an NRC-approved exemption to 10 CFR § 50.54(q) requirements, (3) an early site permit for a commercial NPP, (4) a combined construction permit and operating license for a commercial NPP, or (5) any other NRC license that is now or may become subject to requirements for offsite radiological emergency planning and preparedness activities.

Limited response: response to a request for radiological assistance that involves limited DOE or other Agency resources and does not require the formal field management structure.

Local government: the government of a town, city, county, or region at a local level by locally elected politicians.

Maximally exposed individual: a hypothetical individual who receives the greatest possible projected dose in the area of highest radiation levels over a specified period of time.

Media center: a facility staffed by public information officers from multiple emergency response organizations for the purpose of providing a single designated point of contact with the news media and to facilitate exchange and coordination of information among public information officers from different organizations. This type of facility is also referred to as a Public Information Center, a JIC, a Public Affairs Center, or an Emergency News Center.

Mobilized organization: an organization that has completed the activation process and is able to carry out the essential emergency functions, as required by scenario events and as set forth in emergency response plans/procedures.

Monitoring: the act of detecting the presence of radiation and the measurement of radiation levels, usually with a portable survey instrument.

Monitoring and decontamination facility: a temporary facility established outside the plume emergency planning zone for the purpose of monitoring and decontaminating emergency workers and their vehicles and equipment used in the plume and/or areas contaminated by the plume.

National Incident Management System (NIMS): a set of principles that provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment.

National Operations Center (NOC)
The National Operations Center (NOC) is the principal operations center for the Department of Homeland Security consisting of a NOC Watch, Intelligence Watch and Warning, FEMA National Watch Center and National Response Coordination Center, and the National Infrastructure Coordinating Center. In the event of a natural disaster, act of terrorism, or other man-made disaster the NOC provides situational awareness and a common operating picture for the entire federal government, and for state, local, and tribal governments as appropriate. The NOC also ensures that critical terrorism and disaster-related information reaches government decision-makers. This is achieved through the coordination and integration of information from the NOC as well as the National Cybersecurity and Communications Integration Center, and other Federal operations centers. Additionally, the NOC serves as the national fusion center, collecting and synthesizing all-source information, including information from the state fusion centers, for all-threats and all-hazards covering the homeland security enterprise across the spectrum of prevent, protect, mitigate, respond, and recover."

National Response Framework (NRF): a comprehensive national guidance document that addresses roles, responsibilities, activities, and interdependencies for partners involved in response and short-term recovery actions to disasters and emergencies in the United States. This includes local, tribal, State, and Federal governments, as well as nongovernmental organizations (NGOs) and the private sector.

Noble gases: the chemically inert radioactive gases that are released during an accident at a nuclear power plant.

Non-participating organizations: offsite response organizations that are not participating in emergency planning and preparedness for incidents at a commercial nuclear power plant.

Notification and mobilization of personnel: the transmission of messages to emergency personnel informing them of an incident and directing them to report for emergency duty at their assigned duty stations.

Notification of Unusual Event (NOUE): the lowest of four licensee emergency classification levels indicating that unusual events are in process or have occurred that indicate a potential degradation in the level of plant safety or indicate a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected, unless further degradation of safety systems occurs.

Notifying the public: distributing an instructional message through the EAS or some other system. Additional means may be necessary to communicate effectively with individuals with disabilities and provide meaningful access to people with limited English proficiency.

Nuclide: a general term referring to all known isotopes, both stable (279) and unstable (about 5,000), of the chemical elements.

Offsite: beyond the boundaries of the owner controlled area around a commercial NPP.

Offsite Response Organization (ORO): any state, local, and tribal government; supporting private industry and voluntary organizations; and licensee offsite response organizations (that are formed when State, local, and tribal governments fail to participate in the REP Program) that are responsible for carrying out emergency functions during a radiological emergency.

On-scene: the area surrounding a site that is, or potentially could be, impacted by an incident. This area includes both onsite and offsite areas.

Onsite: beyond the boundaries of the owner controlled area around a commercial NPP.

Onsite personnel: Licensee or contract personnel working at commercial NPP.

Operational: status of a facility (e.g., EOC, EOF, media center, assistance center, emergency worker center, laboratory, etc.) when all key decision makers, as identified in plans/procedures, are at their duty stations and capable of performing all emergency functions assigned to that facility.

Particulate radiation: radiation in the form of particles (e.g., neutrons, electrons, alpha and beta particles) as opposed to electromagnetic radiation.

Persons with access/functional needs: Individuals with Access and Functional Needs: Individuals who have physical, sensory, behavioral and mental health, intellectual and cognitive disabilities, including individuals who live in the community and individuals who are institutionalized, older adults with and without disabilities, individuals who are from diverse cultures, races and nations of origin; individuals who don't read, have limited English proficiency or are non-English speaking, children with and without disabilities and their parents, individuals who are economically or transportation disadvantaged, women who are pregnant, individuals who have chronic medical conditions, those with pharmacological dependency (i.e.: a chemical dependency/addiction), other individuals who are often underrepresented or excluded and the social, advocacy and service organizations that serve individuals and communities such as those listed above.

Persons with disabilities: individuals protected under a variety of civil rights laws who may require physically accessible transportation and facilities, auxiliary aids and services for effective communication, disability-related assistance (DRA), consumable medical supplies, and durable medical equipment, among other things.

Planning Area: a pre-designated geographic subdivision of the plume exposure pathway EPZ. In some plans/procedures, it may be referred to as an Emergency Response Planning Area or an equivalent term.

Plans/Procedures: an organization's documented concept of operations and implementing procedures for managing its internal response to emergencies and coordinating its external response with other organizations. The term *plans/procedures* as used in this manual includes radiological emergency preparedness/response plans, associated implementing procedures such as Standard Operating Guides, and other supporting and referenced materials, all of which are subject to review. The generic term *plans/procedures* is used specifically for flexibility. Procedures may be either incorporated in the main plans or into separate procedural documents at the discretion of the offsite response organization.

Plume: generally a gaseous atmospheric release from an NPP, in an accident or emergency, which may contain radioactive noble gases and volatile solids. While emergency plans/procedures must recognize the very low

probability that particulates could be released in a serious accident, primary emphasis is given to the development of protective actions against the release of noble gases and volatiles such as radioiodines. This cloud is not visible to the eye, but can be measured, or "seen" with radiation measurement equipment.

Plume dose projections: estimates of dosage to the public from exposure to the plume, over a period of time, in the absence of any protective actions.

Plume Exposure Pathway: (1) For planning purposes, the area within approximately a 10-mile radius of a commercial NPP site. (2) A term describing the means by which whole body radiation exposures occur as a result of immersion in a plume release. The area in which plume exposures are likely is described in NUREG-0396 as an area extending out approximately 10 miles from the reactor site and forming roughly a "keyhole" shape, with the keyhole oriented downwind. In the plume EPZ, actions may be required to protect the public from the effects of whole-body external exposure to gamma radiation from the plume and from deposited materials and inhalation exposure from the passing radioactive plume's released materials. The duration of exposure in this mode could range from hours to days in the case of particulate deposition.

Plume Exposure Pathway EPZ: a geographic area approximately 10 miles in radius surrounding a commercial NPP within which the health and safety of the general public could be adversely affected by direct whole body external exposure to gamma radiation from deposited materials as well as inhalation exposure from the passing radioactive plume during a radiological accident. The duration of such exposures could range in length from hours to days.

Population dose projection: projection made by a Federal agency under the Federal Radiological Monitoring and Assistance Plan pertaining to the levels of radiation to which the population within the EPZ will be exposed.

Portal monitor: a radiation monitor consisting of several radiation detectors arranged in a fixed position within a frame that forms a passageway for individuals being monitored.

Post-emergency phase: the EPA term for the period beginning after the utility determines that the release has terminated, and the responsible offsite response organization determines that public safety is ensured by appropriate protective actions in accordance with applicable PAGs and that valuable property has been protected. See also "post-plume phase."

Post-plume phase: includes REP activities (ingestion, relocation, reentry, and return) that occur after a release has been terminated. These activities can be demonstrated in an exercise with the plume phase or separately.

Potassium iodide (KI): a prophylactic compound commonly referred to as a radioprotective drug containing a stable (i.e., non-radioactive) form of iodide that can be used effectively to block the uptake of radioactive iodine by the thyroid gland in a human being.

Potential dose: the radiation dose that could result from a particular set of plant conditions, not based on estimated or measured releases or environmental levels.

Precautionary protective actions: any preventive or emergency protective actions implemented without the verification of radionuclide measurements by field monitoring or laboratory analysis. In addition to evacuation and shelter-in-place it may include relocation of schools, agricultural advisories, clearing of recreation areas and waterways, and other actions.

Pressurized water reactor (PWR): a power reactor in which heat is transferred from the core to the heat exchanger by water kept under high pressure. The primary system is pressurized to allow the water to reach high temperatures without boiling. Steam is generated in a secondary circuit.

Preventive protective actions: protective actions to prevent or reduce contamination of

milk, food, and drinking water such as covering water sources and providing dairy cows with stored feed. Preventive protective actions also include washing, brushing, scrubbing, or peeling fruits and vegetables to remove surface contamination.

Primary coolant: water used to cool and carry heat away from the core of a pressurized water reactor. Heat is transferred from the primary coolant to a secondary loop using a heat exchanger, producing steam to drive the turbine.

Principal Federal Official (PFO): pursuant to the Homeland Security Act of 2002 and HSPD-5, the Secretary of DHS is the principal Federal official for all domestic incidents requiring multiagency Federal response. The Secretary may elect to designate a single individual to serve as his or her primary representative to ensure consistency of Federal support as well as the overall effectiveness of the Federal incident management. When appointed, such an individual serves in the field as the Principal Federal Official for the incident.

Projected dose: the estimated or calculated amount of radiation dose to an individual from exposure to the plume and/or deposited materials, over a period of time, in the absence of protective action.

Protective Action Decision (PAD): measures taken in anticipation of, or in response to, a release of radioactive material to the environment. The purpose of PADs is to provide dose savings by avoiding or minimizing the radiation exposure received by individuals, thereby minimizing the health risks resulting from radiation exposure. Sheltering and evacuation are the two PADs relied upon for limiting the direct exposure of the general public within the plume exposure EPZ. Preventive and emergency PADs are two categories of PADs relied upon for limiting exposure from contaminated food and water in the ingestion exposure EPZ.

Protective Action Guide (PAG): projected dose to an individual in the general population that warrants the implementation of protective action. The FDA and EPA have recommended specific PAGs in terms of the level of projected dose that warrants the implementation of evacuation and sheltering, relocation, and limiting the use of contaminated food, water, or animal feed.

Protective Action Recommendation (PAR): advice to the State on emergency measures it should consider in determining action for the public to take to avoid or reduce their exposure to radiation.

Protective response: implementation of a protective action, including authority to request Federal assistance and to initiate other protective actions.

Public instruction: instructions (warning messages) that are protective action recommendations for the public. Instructions are given by a public official and delivered directly to the public via the notification system (i.e., EAS radio). Message content, timeliness, and accessibility, including people with disabilities or have limited English proficiency, are very important. Messages are repeated by the notification system at least every 15 minutes until updated by public authorities. If applicable, public instructions are coordinated with other authorities.

Public information: information delivered to the media via press conferences, interviews, technical briefings, printed media releases, and telephonic distribution of printed releases. Information needs to be current, accurate, accessible (to people with disabilities and people with limited English proficiency) and timely. All printed releases are coordinated with other authorities before distribution to the media. Ideally, information released in news conferences, briefings, and interviews is coordinated before release. If pre-coordination does not occur, then post-notification of other authorities of critical points discussed in interviews, conferences, etc., is necessary.

rad: radiation absorbed dose, the basic unit of absorbed radiation dose. One rad is equal to an

absorbed dose of 100 ergs per gram of the absorbing material or tissue.

Radiation sickness: the complex of symptoms characterizing the disease condition known as radiation injury, resulting from excessive exposure of the whole body (or a large part) to ionizing radiation.

Radioactivity: the spontaneous decay or disintegration of an unstable atomic nucleus, usually accompanied by the emission of ionizing radiation, generally alpha or beta particles, often accompanied by gamma rays from the nuclei of an unstable isotope.

Radioisotope: an unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5000 natural and artificial radioisotopes have been identified.

Radiological Assistance Program (RAP) team: a team dispatched to the site of a radiological incident by the DOE Regional Office responding to the incident. RAP teams provide radiological field monitoring and assessment support to protect the health and safety of the general public, responders, and the environment.

Radiological emergency: a type of radiological incident that poses an actual or potential hazard to public health or safety or loss of property.

Radiological emergency area: an area established either on an ad hoc basis or pre-identified in a medical facility for monitoring, decontamination, and treatment of contaminated injured individuals, and for contamination control.

Radiological Emergency Preparedness (REP) Exercise: an event involving organizational responses to a simulated commercial NPP incident with radiological and other offsite consequences. The purpose of an exercise is to test the integrated capabilities of involved offsite response organizations to implement emergency functions set forth in offsite response organization radiological emergency response plans/procedures. An exercise may include a full-scale effort, a drill, a tabletop, or other variations.

Radiological Emergency Preparedness (REP) Program: the FEMA program that administers emergency preparedness for all commercial NPP sites.

Radiological Emergency Response Plan (RERP): a detailed plan that describes and coordinates the emergency response organizations, responsibilities, and capabilities of utilities, OROs, and private organizations to ensure public health and safety during an incident in which there is a potential for radiological release.

Radiological Emergency Response Team (RERT): a team located near the affected area that coordinates all field teams and sampling activities.

Radiological survey: the directed effort to determine the distribution of radiological material and dose rates in an area.

Radionuclide: a radioactive isotope of a particular element.

RadNet: EPA's nationwide system for monitoring the nation's air, drinking water, precipitation, and milk for radiation. Results from RadNet monitoring and samples provide baseline data on background levels of radiation in the environment, and can detect increased radiation from nuclear/radiological incidents.

Rapidly-escalating incident: an incident that develops potential or actual severe core damage within a short time. Such an incident results in an initial declaration of or rapid escalation to a Site Area Emergency or General Emergency.

Reception Center (RC): see Reception/relocation center.

Reception/Relocation center (RC): a pre-designated facility located outside the plume exposure pathway EPZ (at a minimum 15 miles from the NPP) at which the evacuated public can register; receive radiation monitoring and

decontamination; receive assistance in contacting others; receive directions to congregate care centers; reunite with others; and receive general information. It generally refers to a facility where monitoring, decontamination, and registration of evacuees are conducted. A reception/relocation center is also referred to as a registration center or public registration and decontamination center.

Recovery: the process of reducing radiation exposure rates and concentrations of radioactive material in the environment to acceptable levels for return by the general public for unconditional occupancy or use after the emergency phase of a radiological emergency.

Recovery plan: a plan developed by the state to restore the affected area with Federal assistance if needed.

Recovery worker: an individual who is permitted to enter the restricted zone under controlled conditions to perform work or to retrieve valuable property.

Reentry: the provisions for the temporary return of the public after evacuation, when the radiation risk has been reduced to acceptable levels (see return).

Reentry recommendation: advice provided to the state by the Cognizant Federal Agency in conjunction with the Senior Federal Official and appropriate Federal departments and agencies concerning ORO guidance or recommendations that may be issued to the public for returning to an area affected by a radiological emergency.

Regional Office Support Team (ROST): a FEMA Regional team that supports the Emergency Response Team. The Regional Office Support Team facilitates deployment of the Emergency Response Team; interfaces with the Emergency Support Team at FEMA Headquarters, with other regional departments or agencies, and with State, local, or tribal agencies and organizations during deployment; provides regional support during deployment; and assists with recall of the Emergency Response Team.

Regional Radiological Assistance Committee (RAC): a committee of representatives from a number of Federal agencies which have agreed to assist the FEMA Region in providing technical assistance to OROs and to evaluate radiological emergency response plans/procedures and exercises on the basis of their special authorities, missions, and expertise.

Regional Response Force (RRF): force identified in the Nuclear Accident Response Capabilities Listing (at the Joint Nuclear Accident Coordinating Center) belonging to DoD or DOE installations, facilities, or activities within the US and its territories. The Regional Response Force may be tasked with taking emergency response actions necessary to maintain command and control onsite pending arrival of the Service or Agency Response Force. Functions with which the Regional Response Force may be tasked, within its capabilities, are: (1) rescue operations; (2) accident site security; (3) firefighting; (4) initial weapon emergency staffing; (5) radiation monitoring; (6) establishing command, control and communications; and (7) public affairs activities.

Release: escape of radioactive materials into the environment.

Relocation: the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure.

Relocation center (RC): see Reception/relocation center.

Rem (**roentgen equivalent man/mammal)**: one rem is the quantity of ionizing radiation of any type which, when absorbed by man or other mammals, produces a physiological effect equivalent to that produced by the absorption of 1 roentgen of X-ray or gamma radiation.

REP: see *Radiological Emergency Planning Program*.

Residual contamination: contamination that remains after steps have been taken to remove it.

These steps may consist of nothing more than allowing the contamination to decay naturally.

Responsible offsite response organization (responsible ORO): an organization designated in emergency response plans/procedures as that organization responsible for a specific emergency function.

Restricted zone: an area of controlled access from which the population has been evacuated, relocated or sheltered-in-place.

Return: reoccupation of areas cleared for unrestricted residence/use by previously evacuated or relocated populations (see reentry).

Roentgen (r): a unit of exposure of gamma (or X-ray) radiation in field dosimetry. One roentgen is essentially equal to one rad (see "rad"). A unit for measuring the amount of radiation energy imparted to a volume of air. The roentgen can be used only to measure X-rays or gamma rays.

Roentgen equivalent man/mammal (rem): one rem is the quantity of ionizing radiation of any type which, when absorbed by man or other mammals, produces a physiological effect equivalent to that produced by the absorption of 1 roentgen of X-ray or gamma radiation.

Scram (Safety Control Rod Axe Man): the sudden shutdown of a nuclear reactor, usually by rapid insertion of the control rods. Emergencies or deviations from normal reactor operation cause the reactor to automatically scram.

Senior FEMA Official (SFO): official appointed by the director of FEMA, or his representative, to direct the FEMA response at the scene of a radiological emergency.

Shelter-In-Place: a protective action that includes going indoors listening to an EAS radio or television station, closing all windows and doors, closing exterior vents, and turning off heating and air conditioning equipment using outside air.

Sievert (Sv): the world standard unit of radiation dose, effective dose, and committed dose. One Sievert is equal to 100 rem, an older unit of measurement used to measure the biological effects of ionizing radiation.

Site Area Emergency (**SAE)**: licensee emergency classification level indicating that events are in process or have occurred that involve actual or likely major failures in the plant functions needed for protecting the public or security events that result in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevents effective access to equipment needed for the protection of the public. Releases are not expected to exceed EPA PAG exposure levels beyond the site boundary.

Special facility: includes schools, licensed daycare centers, hospitals, nursing homes, certain types of industrial plants that may require a lengthy shutdown period, etc., within the plume EPZ that need to be considered separately from the general population when planning for an incident or accident at an NPP.

Standard Operating Guideline (SOG): see *implementing procedures.*

State Coordinating Officer (SCO): an official designated by the governor of an affected state to work with the Cognizant Federal Agency Official and Senior FEMA Official in coordinating the response efforts of Federal, State, local, tribal, volunteer, and private agencies.

Support jurisdiction: see *host/support jurisdiction.*

Thyroid exposure: exposure of the thyroid gland to radiation from radioactive isotopes of iodine that have been either inhaled or ingested.

Total effective dose equivalent (TEDE): the sum of the deep dose equivalent (for external exposures) and for committed effective dose equivalent (for internal exposures).

Traffic control: all activities accomplished for the purpose of facilitating the evacuation of the general public in vehicles along specific routes.

Whole-body exposure: an exposure of the body to radiation, in which the entire body rather than an isolated part is irradiated.