Communication Strategies for Addressing Radiation Emergencies and Other Public Health Crises

Summary of the January 28–29, 2009 Roundtable

The findings and conclusions presented are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Submitted To:

CDC

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Overview

The threat of terrorism involving radioactive materials has grown significantly in recent years. A large-scale incident involving radiation—whether through an improvised nuclear device (IND), a radiological dispersal device (RDD), or a radiological exposure device (RED)—could pose a host of preparedness and response challenges. Among the most important of these is effective communication. Providing clear, comprehensible, credible information to people in a timely fashion is vital for reducing deaths, injuries and illnesses, reducing psychological impacts, and mitigating terror effects of the incident.

Federal agencies have a variety of roles and responsibilities related to communicating with the public before, during, and after an event. To better understand the various efforts currently under way, the Centers for Disease Control and Prevention's (CDC's) Radiation Studies Branch (RSB) contracted with Macro International Inc. to convene a roundtable of representatives from Federal agencies with responsibility for communicating with the public about radiation emergencies. The objectives of this meeting were to

- provide a forum where participants could discuss with one another their respective roles and responsibilities in communicating to the public in the event of a radiation emergency,
- identify existing radiological/nuclear emergency messages and materials for the general public,
- learn what communication planning activities are underway or planned across the various agencies, and
- discuss how the lines of communication can be broadened across agencies.

The roundtable took place January 28–29, 2009, at CDC's Global Communications Center in Atlanta, GA. (See Appendix A for the roundtable agenda.) The program began with remarks by Dr. Michael McGeehin (Director, Division of Environmental Hazards and Health Effects [EHHE], National Center for Environmental Health, CDC) and Dr. Charles Miller (Chief, Radiation Studies Branch in EHHE, CDC) set the stage for the roundtable by emphasizing the role of communication in our ability to respond to a radiation emergency and by stressing the importance of interagency coordination. Next, participants described their roles and their agencies' organizational structures with respect to communicating in the event of a radiation emergency. Then participants had the opportunity to share their agencies' existing communication messages and materials as part of small group and large group discussions. Roundtable participants then discussed the gaps and challenges related to the existing messages and materials.

The second day of the meeting the roundtable focused on the practical application of existing public communication efforts across the participating agencies. Thearis Osuji (Macro) presented some of the results of the recent cognitive testing of messages conducted by Macro on behalf of RSB. Dr. Steven M. Becker (University of Alabama at Birmingham) presented two different radiation emergency scenarios to help participants apply discussions about communication to possible real-world emergencies. At the conclusion of the roundtable, participants agreed that continued interagency coordination and dialogue about communication before, during, and after an event are necessary.

The roundtable provided a forum that allowed communicators across a number of Federal agencies to share information, strategies, and challenges in developing and providing communication messages and materials to the public in preparation for, and in response to, a radiation emergency. Throughout the

discussion, several "big picture" questions were brought up that may be addressed in future interagency efforts.

- Should radiation pre-event education be a priority in light of limited resources? Would this be effective or would pre-event education about radiation either be ignored or scare the public?
- What types of pre-event education are possible? How might these mesh with other preparedness efforts/campaigns?
- How can radiation-related technical terms and concepts be simplified into terms that lay people can understand?
- Can we achieve cross-agency agreement on messages, and if so, how? How can we come to consensus across agencies and disciplines with our different responsibilities, emphases, and interests?
- Can we get radiation emergency subject matter experts to agree on a unified set of messages?
- What communication strategies are more effective: direct to the public or through intermediaries?
- What can and cannot be addressed using an all-hazards approach to preparedness and response?

JANUARY 28–29, 2009

ROUNDTABLE MEETING SUMMARY

Roundtable Participants	
Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR)	Wendy Holmes, Nathan Huebner, Carol McCurley, Michael McGeehin, Charles Miller, Katrina Pollard, Hilda Shepeard, Jana Telfer, Marsha Vanderford
Department of Homeland Security (DHS)	Robert Davis, Stan Heath
Environmental Protection Agency (EPA)	Helen Burnett, Jessica Wieder
Federal Emergency Management Agency (DHS/FEMA)	Jody Cottrill
Homeland Security Institute (DHS/HSI)	Benjamin Brunjes, Benjamin Mallory
National Institute of Environmental Health Sciences (NIEHS)	Jim Remington
United States Department of Agriculture (USDA)	James Barrett, Linda Kelley
Macro International Inc. (Macro)	Doryn Chervin, Carol Freeman, Stephanie Rubel, Steven M. Becker (University of Alabama at Birmingham)

Background and Overview from Michael McGeehin (Director, Division of Environmental Hazards and Health Effects CDC), Charles Miller (Branch Chief, RSB, CDC), and Doryn Chervin (Vice President, Macro)

- Dr. McGeehin, Dr. Miller, and Dr. Chervin set the stage for the meeting with a welcome and stated appreciation for the participation of everyone present. They described the overall goals for the meeting and the objectives they hoped to accomplish during the meeting.
- Dr. McGeehin stressed the importance of communications being concise, accurate, and uniform across agencies.
- Dr. Miller presented a slide show titled Radiation Emergency Communication—Preparing for the Unthinkable. He showed a clip from the movie, *Sum of All Fears*, and noted that this clip represents both a "nightmare" and "why we are here today." He confirmed that there is a growing threat of a terrorist incident involving radiation. Dr. Miller confirmed that public health, and health communication in particular, plays a key role in our ability to respond to radiation emergencies. He also stressed the importance of agencies working together so that they do not contradict one another through their messaging.
- Dr. Chervin began facilitating the roundtable by presenting the agenda and expectations for the meeting.

Participant Introductions, Roles, and Responsibilities

Roundtable participants described their roles and their agencies' organizational structures with respect to communicating in the event of a radiation emergency. Participants were invited to ask one another questions to better understand roles and responsibilities. Each of the structures of the participating agencies' organizations with respect to communicating in the event of a radiation emergency is described in Appendix B, along with organizational charts for each of the participating agencies to further illustrate the organizations structures with respect to communicating in a radiation emergency.

Existing Communication Messages and Materials

Participants were asked to share existing public-facing communication materials with the group. Many of the materials that were shared were developed for dissemination to public health officials or first responders as guidance for communicating with the public in an emergency. For example, the EPA has developed "Communicating Radiation Risks," a pocket guide for emergency responders, which includes a set of tested message maps. The message maps were further expanded to create a radiation-focused "playbook" that EPA communicators use in working with State and local decision makers responding to radiation-related incidents. Likewise, RSB shared two radiological terrorism communication toolkits designed for public health officials and clinicians that include a wide variety of materials, including fact sheets with key information about radiation emergencies, and protective actions.

The various agency materials developed for dissemination directly to the public were mostly in the form of fact sheets and Web-based content. Many agencies indicated that they rely heavily on CDC's Web site for materials and messages. DHS primarily relies on CDC's Web site along with its own "Are You Ready?" materials.

Most of the materials identified specifically focus on dirty bombs or nuclear blasts. Materials have been tested to varying degrees.

In Appendix C, Macro has compiled an inventory of governmental and nongovernmental materials. Below are summary points related to messages and materials shared or discussed at the roundtable.

- FEMA's preparedness messages are for all-hazards preparedness, such as the "Are You Ready?" guide, which has a chapter on radiological events. If an event occurred, FEMA would turn to DHS and other agencies for additional messages and materials.
- Macro is working with DHS clients to identify the four or five most critical protective actions for various hazards, including a dirty bomb and a nuclear explosion.
- HSI has a Pre-event National Leadership Education Program which includes response messaging for leaders from the President down to local officials, such as police chiefs.
- HSI also completed a project to test draft IND preparedness materials (including billboards, handouts, and TV) using focus groups in Tier 1 and Tier 2 cities. The campaign is composed of messages based on an event timeframe (0–4 hours, 4–24 hours, and 24–72 hours), location (sure exposure, possible exposure, and no exposure), weather, and message (shelter, protective actions, human connectivity, etc.). These materials were not shared at the roundtable, but were discussed.
  - After completion of this campaign, it became clear that much more work was needed before those messages could be used with the public. They shifted focus to more of an "all hazards" based campaign.[1] The impetus behind the all hazards focus is that the general public is not generally prepared, and until the public has adopted a preparedness mentality, it may not be receptive to messages that are about a specific type of threat.
- HSI is in the research and development phase with messages for the elderly, people with pets, and businesses.
- ATSDR uses messages provided by RSB. In a radiological event, ATSDR would not have a direct role in determining an immediate communication response. Rather, the agency would work with affected communities (e.g., doing training of health care providers on the long-term effects). ATSDR also has Frequently Asked Questions (FAQs) on isotopes.
- CDC has a number of Web sites with radiation emergency messages and materials. CDC's Emergency Preparedness and Response Web site has a section on radiation emergencies. This section is available in six different languages. Some material is available on a mobile phone Web site (http://m.cdc.gov/menu.aspx?menuId=10). The First Hours Web site (based on the Pre-Event Message Development Project) and the RSB Web site also contain various materials. Each of these Web sites contains messages and materials, including:

[1] The term "all-hazards" was used to describe this type of general knowledge base about cross-cutting safety measures, as opposed to treating all possible threats (e.g., natural disasters, terrorist events involving radiation, chemical or biological agents) as if they require the same set of protective measures.

  - Fact sheets for eight different radioisotopes, radiation sickness, and protective actions (some geared toward the general public, and some tailored toward pregnant women and nursing mothers)
  - B-roll
  - Glossary of radiological terms
- CDC has a lot of material that started out hazard-specific that has been repurposed for general situations (though CDC worked with experts to make sure they are still applicable). None are ready to go out the door. CDC materials focus on dirty bombs and nuclear blasts.
- RSB developed two toolkits—one for public health officials and another for clinicians. The toolkit for public health professionals includes EPA's pocket guide on communicating about radiation risks.
- Macro is currently testing and working with RSB to revise various messages and fact sheets.
- The CDC National Center for Injury Prevention and Control has 16 blast injury fact sheets for mass casualty events. They also have mental health tip sheets with information about how to talk to your kids, coping, and violence during crises. The tip sheets are for all hazards, not specific to radiological events.
- EPA has developed a draft Playbook with expanded message maps. These messages may be turned into public service announcements (PSAs), though they are not currently in PSA format. EPA has also developed *Communicating Radiation Risks*, a pocket guide for emergency responders and local officials.
  - EPA is confident in the messages contained in this guide, and they match DHS and FEMA messages. The booklet was developed by talking to first responders. It has general messages for different types of radiation events. It is geared toward public affairs professionals, and includes various message maps.
- EPA's Office of Public Affairs does not want messages released pre-event. Instead they direct people to CDC's fact sheets. EPA also has press release templates that allow the user to fill in the details about the event themselves, but the core messages remain the same.

Message and Material Development: Gaps and Challenges

Participants identified several gaps and challenges with respect to public-directed communication materials. The comments have been synthesized and categorized below.

Dissemination

- Most information is accessible via the Internet. However, Web-based materials will not reach everyone because of the digital divide.
- Access and knowledge of the CDC Web site is a problem particularly for those who do not and would not have access to the Internet during an emergency.
  - Strategy: CDC is looking into developing mobile sites and PDFs of messages to give to locals before an event. CDC does include a CD with copies of fact sheets in its public health and clinician tool kits.
- There is a need to get the word out to State and local agencies that information is available.

Audience: Meeting the Needs of the General Public

- It is important to determine how to communicate with communities with consideration for people with special needs and low literacy.
- There is no such thing as a single "general public." The public is too diverse to send out blanketed messages—the messages need to be targeted to specific audiences.
- Establishing how to influence the largest numbers of people while also addressing the needs of the most vulnerable (often minority) audiences is essential. The most vulnerable population may not be the largest group; rather, they may be the ones who need to hear the message the most or to hear a different message altogether. (Example: *Shelter-in-place* may be the best instruction for the majority of individuals; however, mobile homes are not considered to be a "safe shelter," and those who live in mobile homes may be more vulnerable, individuals in an emergency).
- The Government's role is to serve everyone.
  - Strategy: Finding conduits or interlocutors to educate different populations.

Messages: Identifying the Appropriate Messages

- It is difficult to go into detail about specific health effects relative to any type of event other than a catastrophic event because they are so variable. Low-level exposures are difficult to predict—it is a mix of factors, much like gene-environment interactions.
- How do we address the need for pre-event education without scaring the public and without damaging the reputations of Federal agencies?
- Within agencies and among agencies, everyone does not agree on what the messages should be (what the science indicates).
- There are many "what ifs"—there are different protective actions for different isotopes, different scenarios, and so forth.
- There is no universal message in the case of radiation emergencies, yet there is a desire to issue a unified, credible, accurate message.
- "Analysis paralysis" was described as a phenomenon experienced in Top Officials National Terrorism Preparedness Exercise 4 (TOPOFF 4) in which decision makers and communicators could not agree on which message to communicate, so there was an extensive delay in getting any message out at all.

Communicating Scientific Information

- It is challenging to communicate scientific information to the public. For example, it is difficult to explain to the public the difference between medical exposure and nonmedical exposure to radiation.
  - One strategy to help address this is to use Harvey Clarke's use of plain language to explain plume maps to decision makers (ongoing work).
  - This can also be addressed by avoiding the use of jargon (e.g., "optimization" and "time, distance, shielding") in communications to the public.
- Multiple research studies, including research carried out as part of the CDC-funded "Pre-Event Message Development Project," have shown that "shelter-in-place" is not an effective term to use with the public, yet this and other potentially unclear terms continue to be used.

- The balance between science and communication needs sometimes conflict. There is a tension between SMEs and communicators within some agencies in determining the best way to communicate information to the public.
- There is a need to balance being succinct and being comprehensive and accurate.

Research Challenges

- Some agencies do not have money to test messages.
- The delay presented by the Office of Management and Budget (OMB) clearance processes for testing messages with more than nine individuals hinders agencies from knowing if their messages are truly effective with multiple audience segments. Because crisis and emergency communication is time-sensitive, there is a demand and urgency to have messages and materials ready to go out in a moment's notice. However, the scientific nature of the information makes it critical that we evaluate our messages and materials to ensure that the intended audiences can access, understand, and follow the instructions given. The lengthy OMB clearance process makes it difficult for crisis and emergency communication specialists to meet both demands.

Radiation-Specific Communication Challenges

- Fatalism can affect a person's response to radiation-specific messages. When some people hear the term "radiation," they assume they are going to die. They don't believe that effective, protective steps can be taken. This can reduce the likelihood that protective actions will be undertaken.
- The all-hazards approach is problematic to some people. People can rehearse for natural disasters, because they are more familiar with them, but people cannot rehearse for terrorism involving radiation.
- There are too many "what ifs" with radiation emergencies (e.g., TOPOFF 4: Two different cities—one was evacuated, the other was sheltered in place. Both were considered appropriate actions).
- It is difficult to determine what to advise people to do if no specifics are known about the incident (explosion). It could be radiological, biological, chemical, etc.
- Communicating about preparedness for radiation emergencies is challenging, because preparedness is not a one-time action. It requires maintenance. Therefore, a "stop, drop, and roll" communication strategy is not practical.
- Collaboration across the Federal agencies is also challenging. The following question was posed by a participant in the group: "If we collaborate as a team to combine what we have today, could we deliver in 90 days a public message with all of our brands/seals to inform the public how to stay alive in a radiation emergency (e.g., a series of protective actions)?" Responses to this question include:
  - "Government doesn't really work that way… It has to be so quick in an event…" In terms of tactical aspects, local-level authorities would be the ones to release a statement of what to do (not the Federal Government).
  - State and local public health officials look to CDC, DHS and EPA to know what to say. It is important to get a set of messages that are agreed upon and approved across agencies before an event. Example: Use of bleach during Hurricane Katrina. There was a lack of

agreement about how to tell the public to use bleach during this emergency. This disagreement still exists on bleach standards and associated messages.

Message and Material Development: Strategies

Participants also described strategies for addressing gaps and challenges related to message development and testing. Strategies are categorized and listed below.

Dissemination

- Pre-position messages and materials with trusted emergency information sources such as meteorologists to be key interlocutors. Agencies can work to establish relationships with these trusted sources to reach communities. Some Federal agencies are working on such efforts. For example:
  - Through its public affairs departments, EPA is developing radiation messages, and training public health and State officials and teaching them how to communicate with the public by conveying simple messages. They also are developing an EPA crisis communications plan. They are pulling from the CDC's ECS organizational structure (which was noted by participants as a sound organizational structure). The States have expressed appreciation for EPA's guidance and messaging.
  - The United States Department of Agriculture (USDA) has worked with nongovernmental organizations to get preparedness messages about pets to the public.
- Other strategies that can be used to enhance message and material dissemination include:
  - Explore different methods for communicating.
  - Help prepare local responders for communication to the public.
  - Focus on building partnerships and work with trusted sources instead of going straight to the public.
  - Teach preparedness in schools.
  - Have the messages come from the local level.
  - Focus on educating and partnering with local groups. (Example: During Hurricane Katrina, CDC partnered with interfaith organizations to deliver messages to the public.)

Messages: Identifying the Appropriate Message

Potential strategies to help identify appropriate messages include:

- Look for disagreement across agencies and address those issues first.
- Encourage scientists to come to a consensus and to appreciate the needs of communicators in times of crisis.
- Explore opportunities/feasibility of pre-event education.
- Develop messages that are categorized by time, location, and population.
- Have an exercise with local representatives to find out what they need and then develop a tool kit that has the logos of the Federal agencies with all the response messages they can use.
- Provide pre-event education (described as "essential").
- Increase the general knowledge base so there is a "culture of preparedness."
- Combat public notions of fatalism.

Communicating Scientific Information

- EPA is working on plume modeling for a radiation emergency and working on making maps more understandable for decision makers.
- Federal agencies might also capitalize on international incidents as "teachable moments" by conducting research immediately after an incident.

Research

- Participants suggested several methods for testing messages and materials. For example:
  - Conduct more TOPOFF or national-level exercises that include larger and more systematic components related to communication.
  - Develop performance measures to evaluate our communication effectiveness.
  - Test messages with decision makers and local communicators (i.e., meteorologists).
- To help address some of the concerns associated with the time period for obtaining OMB approval, participants suggested using CDC's blanket OMB clearance to test health messages, or working with HSI, as they are not subject to OMB.

General Strategies for Effective Communication

- Establish and maintain transparency with the public.
- Take a "one-lane" approach where each agency deals with different aspects of a radiation event.
- Engage in interagency coordination.

Presentation of RSB's Cognitive Testing Results

Thearis Osuji presented some of the results of the recent cognitive testing of messages conducted by Macro on behalf of RSB. The final report is being written and will be available on RSB's Web site in 2009.

Practical Application Scenarios and Discussion

Dr. Steven M. Becker presented two different radiological emergency scenarios to the group. The purpose of the scenarios was to help participants apply discussions about communication to possible real-world emergencies. After each scenario was presented, the group was asked to discuss the urgent communication needs for the public, templates and strategies that could be used to meet those needs, and gaps. Highlights of the two scenarios are provided below.

Scenario #1: Radiological Dispersal Device

- Time of day: Early evening
- City population: 850,000
- Location: Bookstore, 325 people in the store
- Event type: No-notice, terrorism, explosion, smoke and fire, mass casualty situation
- Isotope: Cesium-137

Urgent Communication Needs for the Public

- Key information (for the public) includes:
  - What happened?
  - Is it going to happen again?
  - Information about health issues, including info. about cesium-137
  - What do people need to do now to protect selves, loved ones?
- Messages for the people who would self-evacuate (that is inevitable).
- Tell the public what the Government is doing—even if you don't have the answers, you need to tell them what you are doing to work on it.
- Messages about what to do if you think you have been exposed (including those who think they may have been exposed but were not).
- Question: What about pregnant women?
  - Pregnant women would call their doctors and possibly CDC-INFO. Doctors need to be prepared to answer their questions (pre-event planning is required).

Communication Strategies and Response Processes

- The Secretary of Homeland Security's mission is to get out and go public with a message within an hour after an event—and DHS would do everything possible to enable the secretary to do so.
- Advisory teams would need to advise local officials and public information officers.
- DHS would immediately initiate a National Incident Communications Conference Line (NICCL) call, with all of the appropriate agencies/people on the line, to talk about what needs to be done and coordinate next steps.
- USDA would immediately begin looking at food distributions chains to determine how to ameliorate the issue of food.
- After CDC/ECS assessed the situation, they would send out cleared materials.
- Information would be posted and reorganized on CDC's Web site.
- Epi-X (used to communicate with clinicians) would be used to communicate with clinicians and would help determine the information they would need.

What Templates Are in Place?

- There are materials that can be repurposed for this scenario, but all of the agencies have different templates.
- DHS would direct media and everyone else to CDC's Web site for health information.

Scenario #2: Radiological Exposure Device

- Time of day: Afternoon
- City population: 2 million
- Location: Mall food court
- Event type: No-notice, terrorism, covert
- Isotope: Cobalt-60

Urgent Communication Needs for the Public

- People need information on health issues and protective actions.
- Question: At what point do we assure the public that we have the threat and their safety under control?
  - DHS wants to inform people (as opposed to reassure them). DHS would say, "We have experts doing their best to guard your safety."
- People need to be told how to determine if they are exposed and how to respond.
- This scenario presents a teachable moment for those unaffected.

Gaps and Challenges

Many more communication gaps and challenges were identified in response to this event compared with Scenario #1.

Information Accessibility Gaps

- EPA has information on this type of scenario (an RED), but it would be very difficult for people to find on their own.
- USDA has information on the isotope in their food guide, but that is not publicly available on the Web.
- Identifying the isotope could take anywhere from 90 minutes to 4 hours.
- The scripts for CDC-INFO may not be specific to this type of isotope.
- Federal agencies (collectively) have a large amount of information, but need to find a way to organize it and distribute it to the people.
- It would be beneficial to develop a process to organize the most useful information. Though it will never be possible to prepare information specific to every possible situation in advance, the information that is available should be compiled into a usable format.

Potential for Confusion

- The public would demand information right away if people become sick—especially if children

are involved. There also would be confusion about contamination versus exposure.

- Research has shown that there is confusion regarding dirty bombs versus nuclear detonation. So, if the communications do not explain the difference, people may search and find information that tells them to do the wrong thing.

Gaps and Challenges

Logistical Considerations

- CDC needs to be invited into a community, so often they work behind the scenes with State health departments.
- Decisions ultimately would be made at the local level. Federal agencies would have less concrete information about the situation at the local level. People would need to seek medical attention; how and where they would do that would be a local decision, not a Federal decision.
- Although malls would close, people would still go to schools to pick up children—and not just locally, but nationally, especially with the threat of subsequent threats. Their informational needs would need to be met.
- The terrorism aspect completely changes the situation; however, it still provides a teachable moment to educate the country about radiation. Every incident affects every State.
- A Federal Bureau of Investigation (FBI) agent may not want to enter into a radiation scene out of health concerns (this source is "very hot"), so that terror message may come later. However, a teachable moment may be available to educate people about the source and the isotope.

Communication Strategies and Response Processes

National Press Conference

- Local government agencies would handle the situation rather than Federal agencies. If they received communication with threats of other attacks, Federal agencies would come in. The threat would warrant a national press conference. Secretary Napolitano would speak publicly with a local public health official and perhaps someone from CDC or HHS.

Web

- This situation would be a great opportunity to use the Web site. If someone were to search this type of isotope on the Web, CDC's Web site would appear as the top result in a Google and Yahoo! search. CDC would move information on the isotope to the front page of their Web site.
- Another Web site is about to be launched called http://www.publichealthemergency.gov. It's a portal that will connect people to different links and Web sites of the different agencies with relative information.
- ATSDR would highlight this isotope on their Web site.
- EPA already provides general information on cobalt-60, but not information on protective actions for it.

Information Networks

- CDC would help state and local authorities notify people who were in the vicinity of the radiation source and use a health alert to give information to clinicians.
- DHS would also set up a Federal newsroom.
- NICCL calls—DHS would always be on the line in the NICCL calls. For situations in which terrorism is suspected, DHS would take the lead.

Communication Strategies and Response Processes
Messages ◆ FBI and DHS would go into automatic pilot regarding the act of terrorism and would use messages already developed by CDC on radiation. ◆ Local agencies might already have messaging on incidents involving hazardous materials. ◆ Messages on terrorism would come from DHS. EPA and CDC messages would stay the same.

Concluding Statements and Recommendations

Roundtable participants agreed that continued interagency coordination and dialogue about communication before, during, and after an event are needed. Future workgroups and subsequent roundtables were suggested. Several key strategies emerged. The following strategies and recommendations may serve as a springboard for workgroup activities and objectives.

Key Strategies and Recommendations

- Bring together SMEs and communicators to try to reach an agreement on appropriate messages for the public. Roundtable participants suggested interagency working groups or other forums to come together on a regular basis. Specific workgroup suggestions included:
  - Developing and assessing messages around radiation response, preparedness, etc.
  - Packaging of messages such that communicators address the individual needs of different groups
  - Categorizing messages into "buckets" to centralize and synthesize the messages for some sort of tool kit or other resource for State and local officials
  - Exploring where/how to position messages to fill in the gaps
    - For example, after an event, people might be evacuated; if so, communications need to address people's needs as they are being evacuated as well as the needs of the communities that are going to have to accept evacuees.
- Conduct more research to answer questions about specific audience/cultural needs around communicating radiation risks.
- Explore and counter public fatalism relative to radiation emergencies.
- Increase an all-hazards knowledge base among the public (also referred to as a culture of preparedness); build a basic understanding among the public so they can better understand and receive radiation-specific messages.
- Identify priority outreach strategies—whether via direct-to-public communication or communication via partners and interlocutors.
- Address the challenge of OMB delays on audience research/message testing.
- Determine when to put out which messages (1–4 hours, 4–24 hours, 24–72 hours, etc.).
  - One suggestion was to use Crisis and Emergency Risk Communication recommendations to identify what people need to know at each stage of an event and overlay what we know the media would ask; work with SMEs to hear what they believe people need to do; and then develop a coordinated set of messages.
- Conduct more communication-centered exercises (e.g., a TOPOFF exercise).
- Conduct a needs assessment among State and local responders to help meet their needs.

- Develop some sort of mutually branded product (a kit or set of messages) for State and local officials.
- Use ESF-15 Annex F (coming in 2009) which will outline the Federal communication plan. This annex will deal with public information. Stan Heath is presently writing this annex and would like to involve the roundtable participants.

"Big Picture" Questions

Participants also raised several "big picture" questions that may be addressed in future cross-agency collaborations.

- Should radiation pre-event education be a priority in light of limited resources? Would this be effective or would pre-event education about radiation only scare the public or be ignored entirely?
  - There was a lack of consensus on this issue. Some participants felt it was not worthwhile and that the public would not pay attention to messages on radiation until an actual event occurred, while others felt it was essential.
- What types of pre-event education are possible? The "it depends" factor associated with a radiation emergency makes it difficult to have messages created pre-event.
- How can we communicate radiation-related terms and concepts into terms that lay people can more easily understand?
- Can we achieve cross-agency agreement on messages, and if so, how? People need to know things at different times, and all of the different agencies would see things differently throughout the event. How can we come to consensus across agencies and disciplines with our different interests?
- How can we get the SMEs to agree and buy into a unified set of messages?
- What communication strategies are more effective—direct to public or communication through intermediaries?
- What can and cannot be addressed using an all-hazards approach to preparedness and response?
  - Limitations of this approach were noted because of the specific protective actions required during a radiation emergency. Others pointed to basic preparedness knowledge that may be essential to surviving multiple threats (e.g., shelter-in-place and evacuation skills).

Appendix A
Agenda

JANUARY 28–29, 2009

Centers for Disease Control and Prevention

Global Communications Center

Day 1: Where Are We Today?

January 28, 2009

Arrival and Light Refreshments	8:00 AM – 8:30 AM
Welcome and Introductions	8:30 AM – 9:00 AM
Brief Introductions (name, agency, position)	9:00 AM – 9:15 AM
Purpose of the Roundtable and Objectives	9:15 AM – 9:30 AM

- Purpose of the Roundtable and Objectives
  - Share with one another our roles and responsibilities in communicating to the public in the event of a radiation emergency
  - Identify existing messages and materials for the general public
  - Learn what communication planning activities are underway or planned
  - Discuss how we may be able to broaden the lines of communication across agencies

Roles and Activities Concerning Radiation Emergency Communication to the General Public	9:30 AM – 10:15 AM

- What is your agency's role in communicating to the general public in a radiation emergency on the basis of your agency's mission and Federal mandates?
- How is your agency structured? Who does what related to communication about radiation?

Morning Break	10:15 AM – 10:30 AM
Roles and Activities Concerning Radiation Emergency Communication *(continued)*	10:30 AM – 11:30 AM

Lunch and Time to View Displays of Communication Materials	11:30 AM – 12:30 PM
Tour of the CDC Emergency Operations Center (Group 1)	12:30 PM – 1:00 PM
Tour of the CDC Emergency Operations Center (Group 2)	1:00 PM – 1:30 PM
Reconvene and Introduction to Small Group Sessions	1:30 PM – 1:45 PM
Small Group Session 1: Existing Communication Messages and Materials ◆ What types of messages and materials do you have or are you currently working on? ◆ What gaps or challenges has your agency encountered in developing and/or evaluating these messages and materials? ◆ What strategies has your agency used or considered to address these challenges?	1:45 PM – 3:00 PM
Afternoon Break	3:00 PM – 3:15 PM
Small Group Session 1 Debrief	3:15 PM – 4:15 PM
Wrap-up and Day 2 Overview	4:15 PM – 4:30 PM
Optional Dinner	5:00 PM

JANUARY 28–29, 2009

Centers for Disease Control and Prevention

Global Communications Center

Day 2: Practical Application

January 29, 2009

Arrival, Logistics, and Light Refreshments	8:00 AM – 8:30 AM
Welcome Back, Announcements, and Recap from Day 1	8:30 AM – 8:45 AM
Small Group Sessions: Practical Application to three Scenarios	8:45 AM – 10:15 AM

- What are the most critical communication needs?
- What are the primary communication objectives?
- What are the most difficult communication challenges associated with this event?
- What materials/messages are in place?
- What's missing?

Morning Break	10:15 AM – 10:30 AM
Continuation of Small Group Sessions and Discussion	10:30 AM – 11:00 AM
Moving Forward	11:00 AM – 11:30 AM

- How can we coordinate our efforts to meet the communication needs of the public concerning radiological emergencies?
- What is needed to facilitate this work moving forward?
- What future roundtables might be useful?

Review Recommendations and Plans for Roundtable Summary Dissemination	11:30 AM – 12:00 PM
Closing and Adjourn	12:00 PM – 12:15 PM

Appendix B
Descriptions of Federal Agency Organizational Structures

CDC Roles and Responsibilities

The Department of Homeland Security (DHS) is the Coordinating Agency for all deliberate attacks involving nuclear/radiological facilities or materials, including RDDs and INDs. HHS is one of several Cooperating Agencies, and CDC is an operating division of HHS. Three groups within CDC play critical roles in communicating to the public in the event of a radiation emergency: (1) CDC's Emergency Communication System (ECS), (2) National Center for Environmental Health (NCEH)/Agency for Toxic Substances and Disease Registry (ATSDR) Office of Communication Science, and (3) the Radiation Studies Branch (RSB) in NCEH.

- **ECS** represents CDC for communications in public health emergencies.
- ECS is positioned within the National Center for Health Marketing (NCHM) and serves as a point of coordination and liaison for emergency communications. In the event of a public health crisis, ECS would (1) become CDC's communications liaison with other Federal and State agencies involved in the emergency and (2) bring together the appropriate communications and science professionals within CDC to design communication strategies to address the emergency.
- ECS has an archive of existing communications and relevant communication theories. Staff members also work with subject matter experts (SMEs) and NCEH/ATSDR staff to answer questions specific to the event. Staff members also monitor and evaluate communications related to the event—they look at media content, blogs, questions from the public given to CDC-INFO (the agency's information hotline), and what reporters are asking. This information, together with specific information about the event, is used to determine what to communicate to the public and how to repurpose existing communication materials.
- ECS addresses all public health emergencies. Because staff members in ECS do not necessarily have subject matter expertise in radiation, in a radiation emergency, the head of ECS would call upon the Associate Director for Communication Science in **NCEH/ATSDR** who would, in turn, call upon the appropriate program staff members and the Health Education and Health Communications Specialists of **RSB**.
- The RSB Health Education and Health Communication Specialists would work to determine existing messages and materials that could be used to address the radiation emergency and help ECS to repurpose them to address the current event.
- ECS determines what CDC information would be disseminated to address the emergency, and how this information would be disseminated. They reach out to clinicians and partners such as the American Red Cross, the media, other CDC employees, and policymakers to determine what information is delivered through secure or public networks; global audiences including the World Health Organization (WHO) and the Pan American Health Organization (PAHO) through CDC-INFO hotline and through the CDC Web site; and directly to communities affected by the event. ECS also has a cooperative agreement with the **National Public Health Information Coalition,** which allows them to get information to senior State public health information officers, public information professionals, and academics.

DHS Roles and Responsibilities

DHS is the Coordinating Agency for all deliberate attacks involving nuclear/radiological facilities or materials, including RDDs and INDs. The DHS Office of Public Affairs (OPA) is the primary office responsible for coordinating communications with other agencies and the public. In the event of an incident requiring a Federal coordinated response, such as a radiation emergency, OPA would activate the NJIC (National Joint Information Center). As part of the Secretary of Homeland Security's responsibility to coordinate incident management under the Homeland Security Presidential Directive 5 HSPD-5, the *National Response Framework (NRF)—Incident Communications Emergency Policy and Procedures*[2] (ICEPP) provides detailed guidance to Federal incident communicators on activities to be initiated in conjunction with incidents requiring a coordinated Federal response.

- Upon activation of Emergency Support Function #15—External Affairs Annex (ESF #15) by the DHS Assistant Secretary for Public Affairs, Federal external affairs resources will be employed to conduct sustained operations in support of the Principal Federal Official (PFO), Federal Coordinating Officer(s) FCO(s), and Joint Field Office(s) JFO(s).
- NJIC serves as the Federal incident communications coordination center during incidents requiring a coordinated Federal response. The NJIC coordinates with and supports the White House Office of Communications, the Secretary of Homeland Security, DHS National Operations Center (NOC), the Crisis Action Team (CAT), the Incident Management Planning Team (IMPT), the National Response Coordination Center (NRCC), the National Infrastructure Coordinating Center (NICC), PFO, FCO, JFO, and ESF #15 staff.
- Strategic communications direction will originate from the White House Office of Communications, Senior Energy Officials (SEOs) from the DOE National Nuclear Security Administration (NNSA), DHS Assistant Secretary for Public Affairs, and the Department of Justice/Federal Bureau of Investigation (DOJ/FBI). Communications strategies and tactics will be coordinated with State and local government officials to forge a unified effort and common messaging.
- The National Incident Communications Coordination Line (NICCL) is used to transmit and exchange of critical and timely (i.e., "breaking") incident information among Federal and affected State, local, and tribal authorities. DHS Public Affairs will maintain controllers on the line continuously to provide and receive updates from Federal departments and agencies.
- The State Incident Communications Coordination Line (SICCL) is a similar dedicated Federal/State incident communications conference line.
- The Private Sector Incident Communications Coordination Line (PICCL) is a standing line that DHS Public Affairs uses to provide timely public information to the nation's critical infrastructure and key resources (CIKR) and their affiliated entities during an incident requiring Federal coordination and response.
- In the initial hours following an IND detonation, the Secretary of Homeland Security, Attorney General, and/or FBI Director and/or a DOE-NNSA SEO will deliver a formal statement. The

[2] ICEPP comprises the Public Affairs Support Annex and the ESF #15—External Affairs Annex of the NRF. Department of Homeland Security. (2008). *National Response Framework.* Washington, DC. Retrieved October 1, 2009, from http://www.fema.gov/emergency/nrf/index.htm#.

formal statement may include incident facts, Homeland Security Advisor System (HSAS) and threat status, public instructions, law enforcement, intelligence, protective measures, and Federal incident response support.

- DHS OPA has established the Domestic Communications Strategy (DCS), which will be activated for an IND incident. The DCS is a dynamic, evolving strategy that includes Federal department and agency options and actions that could be employed as a result of a credible threat or detonation. The White House Office of Communications reviews and approves its content and provides strategic direction during its employment.
- The **Federal Emergency Management Agency (FEMA)** within DHS coordinates all-hazards preparedness messaging efforts. FEMA also manages the Federal response to any national emergency (including radiation emergencies). FEMA's planning and products component within ESF #15 will have the primary responsibility for creating these products, which include press releases, talking points, Microsoft PowerPoint presentations, graphics, congressional briefings, flyers, Web content, daily summaries, and video content.
- The **Homeland Security Institute (HSI)** is a federally funded research and development center established under Section 213 of the Homeland Security Act in 2002. HSI assists DHS in addressing issues where scientific, technical, and analytical expertise is necessary. HSI's work includes conducting research to support DHS's radiation emergency communication activities.

EPA Roles and Responsibilities

During a radiological emergency, the Environmental Protection Agency (EPA) will respond as outlined in the U.S. EPA National Approach to Response Crisis Communications Plan. EPA's Center for Radiation Information and Outreach is a small group in the Radiation Protection Division. In a radiation emergency, the members of this group will provide communications support to our Public Information Officers (PIOs) at our Emergency Operations Center, at the NJIC (if assigned), or out in the field.

- Under the NRF's Nuclear/Radiological Response Annex, EPA has roles as both a support agency and as a Coordinating Agency. EPA may be called in as a support agency for radiological events that involve materials licensed, owned, or operated by another Federal agency or an agreement state. EPA is the Coordinating Agency for emergencies involving a source or facility that is not licensed, owned, or operated by another Federal agency and for emergencies involving radiological releases outside the United States. In accordance with the NRF, the Coordinating Agency supports the DHS incident management mission by providing the leadership, expertise, and authorities to implement critical and specific aspects of the response.
- As part of EPA's Office of Radiation and Indoor Air and one of EPA's Special Teams, the Radiological Emergency Response Team (RERT) supports Federal, State, tribal, and local agencies responding to radiological incidents and emergencies. The RERT provides technical advice, monitoring, sampling, data assessment, and cleanup assistance. These services focus on minimizing threats to public health and the environment. Along with the technical experts and specialized equipment, RERT has PIOs specializing in radiological crisis communications.
- During a radiological incident, EPA retains full responsibility for crisis communication programs and policies related to its activities. EPA will implement an organized, integrated, and coordinated mechanism to ensure the delivery of understandable, timely, accurate, and consistent information to the public in a crisis as outlined in EPA's National Approach to Response Crisis Communications Plan.
- EPA will work within the National Incident Management System (NIMS) and the NIMS Incident Command System structure, recognizing that PIOs occupy a key position with the Incident Management Team. EPA will contribute to the overall unified message of the response and support external affairs activities based on the ESF #15 Annex of the NRF, including providing staff and other support to the NJIC if requested.
- EPA, through its field and regional incident management structures, will support the interagency effort under ESF #15 by providing the media and the public with information on EPA's response activities. EPA will deploy public affairs personnel to the NJIC or other ESF #15 functions of an incident when requested by the DHS ESF #15 Director.
- In the event of a radiation emergency, EPA will work with Federal, State, and local partners to identify and respond to public outreach needs. The Incident Commander (IC) and PIOs should identify public concerns about the incident and response activities and take appropriate action in cooperation with the Senior Federal Officials (SFOs), and State and local authorities. EPA will make every effort to give the media access to agency incident operations so they can report them fully and accurately to the public. EPA will issue press releases and other materials to inform the media and the public of the health and environmental consequences of the incident. EPA's Office of Public Affairs (OPA) in coordination with the Office of Environmental Information

(OEI), the DHS Web team, and the relevant regional Public Affairs Directors and Headquarters program offices, will develop and maintain one Web site to keep the public informed of the incident status. All approved content and data will be posted to the Web site as quickly as possible. Phone lines will be established with a published number for public inquiries

NIEHS Roles and Responsibilities

The Worker Education and Training Branch within the Division of Extramural Research and Training provides approximately $27 million in training grants to approximately 18 consortia that provide training to responders and workers on hazardous materials under the Superfund Amendments and Reauthorization Act (SARA) of 1986 as well as funding from the Department of Energy. Through cooperative agreements with grantees, we respond under the Workers Safety and Health Support Annex of the National Response Framework to provide health and safety training at disaster sites. Our grantees have thousands of peer trainers and training resources that cover all 50 States and the U.S. territories.

- The Worker Education and Training Program (WETP), as a Cooperating Agency of the Worker Safety and Health Support Annex of the National Response Framework, supports all ESFs to provide health and safety training. Specifically, the agency provides technical assistance such as instructional staff, curriculum development experts, SMEs, and professional staff. Materials produced are targeted toward workers but are also used by volunteers, public health officials, and other populations whose health and safety maybe affected by a disaster.
- WETP disseminates health and safety training and educational information through the National Clearinghouse for Workers Safety and Health Training (http://tools.niehs.nih.gov/wetp/) as well through partnerships with other Federal agencies that have an interest in the protection of workers in the aftermath of disasters. Activities that require communications outreach with mass media can be coordinated through our institute's public affairs division; otherwise our outreach is conducted primarily through grantees and their consortia and our partner governmental agencies.
- Before and during a disaster response WETP has thousands of trainers and equipment that can be dispatched to a disaster site to provide education and training necessary to protect the health and safety of responders. WETP also has access to SMEs of various occupational specialties who can provide disaster- and job-specific expertise. Through its partnerships with other Federal entities under the National Response Team and the Worker Safety and Health Support Annex to the National Response Framework, WETP can support and provide a consistent health and safety message throughout the disaster zone.
- The National Defense Authorization Act for FY 1992 and FY 1993 (42 USC 7274[d]) authorized the Secretary of Energy in Section 3131(a)(1)(A)-(B) to make awards "to provide training and education to persons who are or may be engaged in hazardous substance response or emergency at Department of Energy (DOE) nuclear weapons facilities; and to develop response curricula for such training and education." The Secretary was further authorized in Section 3131(a)(2)(A)-(B) to make the training awards to nonprofit organizations demonstrating capabilities in "implementing and conducting effective training and education programs relating to the general health and safety of workers; and identifying, and involving in training, groups of workers whose duties include hazardous substance response or emergency response." The NIEHS/WETP has been designated to provide these activities through the awarding and administration of grants and to adapt its existing program to meet the needs of the DOE nuclear weapons complex. As a result, WETP has a number of grantees who work with radiological waste on a daily basis and provide our network with the expertise needed to respond to radiological disasters. In addition, WETP has created awareness-level training material that can be provided as a preparedness tool or a just-in-time training needed to prepare workers for dealing with the health and safety issues related to radiological disasters.

USDA Roles and Responsibilities

Three agencies within the United States Department of Agriculture (USDA) play critical roles in communicating with the public in the event of a radiation emergency: (1) the Animal and Plant Health Inspection Service (APHIS), (2)Food and Nutrition Service (FNS), and (3) the Food Safety and Inspection Service.

While each of these agencies has its own external or public affairs office, post-event messaging from them would likely be directed to ESF #15 through the USDA Office of Communications (OC), which has a Homeland Security liaison to handle communications and messaging for emergencies and disasters.

- OC provides leadership, expertise, counsel, and coordination for the development of communications strategies that are vital to the overall formulation, awareness, and acceptance of USDA programs and policies and serves as the principal USDA contact point for the dissemination of consistent, timely information.
- APHIS coordinates any response efforts for incidents involving an animal disease, plant disease, or plant pest. APHIS also plays an important supporting role in response efforts involving Emergency Support Function #11—Agriculture and Natural Resources (ESF #11) and other ESF groups. For example, when needed, APHIS helps to support Emergency Support Function #8—Public Health and Medical Services in addressing animal and veterinary issues during natural disasters.
- FNS works with State agencies to determine disaster-related nutrition assistance needs, obtain appropriate food supplies, and arrange for delivery of these supplies. FNS also authorizes the Disaster Supplemental Nutrition Assistance Program, which provides electronic benefit transfer cards for disaster victims.
- FSIS ensures that the nation's supply of commercially produced meat, poultry, and egg products are wholesome, produced in a sanitary environment, and labeled properly. This includes inspecting and verifying food safety aspects of slaughter and processing plants, products in distribution and retail sites, and import facilities at ports of entry; conducting laboratory analysis of food samples; controlling products suspected to be adulterated; closing facilities when necessary; carrying out food-borne disease surveillance; and conducting field investigations.

Appendix C

Summary of Existing Government and Nongovernment Public-Facing Radiological Communications Materials

SUMMARY OF EXISTING GOVERNMENT AND NONGOVERNMENT PUBLIC-FACING RADIOLOGICAL COMMUNICATIONS MATERIALS

<table>
<tr><th colspan="5">U.S. ENVIRONMENTAL PROTECTION AGENCY</th></tr>
<tr><td colspan="5"><u>Protective Action Guides (PAGs):</u> Informational materials to help State and local authorities make radiation protection decisions during emergencies. EPA developed the PAG Manual to provide guidance on actions to protect the public.</td></tr>
<tr><td colspan="2">AUDIENCE: Health Depts.</td><td>CHANNEL: Print, Web</td><td>PURPOSE: Protective Actions</td><td>PHASE: During Event: Early, Intermediate, Late</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="2">• Sheltering
• Evacuation
• Control of access
• Administration of stable iodine</td><td colspan="2">• Relocation
• Decontamination of land and property
• Food and water controls</td></tr>
<tr><td colspan="5">Web Address: http://www.epa.gov/rpdweb00/rert/pags.html</td></tr>
<tr><td colspan="5"><u>EPA’s Protective Action Guides (PAGs) T4 – Messages:</u> A set of messages created for the TOPOFF 4 exercise that describe the purpose and use of the PAGs.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Print (exercise materials)</td><td>PURPOSE: Education, Protective Actions</td><td>PHASE: Pre-event; During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">• What are the PAGs?
• How do the PAGs work?
• What type of protective actions might be taken?
• Who uses the PAGs?
• What authority does EPA have to give this guidance?
• What other agencies provide radiological guidance?
• How clean is clean for recovery?</td></tr>
<tr><td colspan="5">Web Address: Not available.</td></tr>
<tr><td colspan="5"><u>Radiation Protection Basics:</u> With a focus on time, shielding, and distance, the Web page provides a brief history of radiation protection, an introduction to and explanation of radiation warning symbols, and a radiation warning sign gallery.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Web</td><td>PURPOSE: Protective Actions, Education</td><td>PHASE: Pre-Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">• Time, Distance, Shielding</td></tr>
<tr><td colspan="5">Web Address: http://www.epa.gov/radiation/understand/protection_basics.html</td></tr>
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U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
Radiation Health Effects: An EPA Web page devoted to the health effects of short- and long-term exposure to radiation.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	• Radiation and health • How does radiation cause health effects? • What kinds of health effects does exposure to radiation cause? • Is any amount of radiation safe? • How do we know radiation causes cancer? • Aren't children more sensitive to radiation than adults? • Effects of radiation type and exposure pathway • Non-radiation health effects of radionuclides?	• Do chemical properties of radionuclides contribute to radiation health effects? • Non-radiation health effects of radioactive materials • Estimating health effects • What is the cancer risk from radiation? How does it compare to the cancer risk from other sources? • What are the risks of other long-term health effects? • What limits does EPA set on exposure to radiation? • How does EPA protect against radionuclides that are also toxic?	
Web Address: http://www.epa.gov/radiation/understand/health_effects.html			
" What you can do": An EPA Web page devoted to what you (the general public) can do to "prepare ahead of time to help protect yourself and your family in the event of a radiological emergency."			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Protective Actions	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• Emergency kit (Ready.gov) • Well-fitting face masks • Radiation detection equipment • Potassium Iodide • Develop basic emergency skills • Types of radiological emergencies and how to develop appropriate plans: o Nuclear power plant incidents (Ready.gov) o Nuclear explosions (Ready.gov) o Radiological dispersion devices (Ready.gov) o Lost (orphan) radiation sources and devices o Transportation accidents o Accidents involving satellites containing radioactive materials	• Radiation education: o Ways you can be exposed (inhalation, ingestion, direct exposure) o The health effects of radiation (cancer, radiation sickness) o Radiation protection basics (time, distance, shielding) • Join Citizen Corps • Resources	
Web Address: http://www.epa.gov/radiation/rert/whatyoucando.html			

<table>
<tr><th colspan="4">U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)</th></tr>
<tr><td colspan="4"><u>"Health Messages for Cesium-137":</u> A fact sheet created for the TOPOFF 4 exercise containing information about the health effects of cesium-137 exposure.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Print (exercise materials)</td><td>PURPOSE: Education</td><td>PHASE: During event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">
• Health Risk – Primary Messages
o At this time, responders are in the process of determining the extent of contamination from the incident.
o Areas around the incident site may be impacted differently due to difference in weather patterns and geography.
o The instructions given by local and state officials are to help residents in the areas potentially impacted take action to minimize their radiation exposure.
• How can cesium affect my health?
o Like all types of radiation, exposure to radiation from cesium-137 increases the risk of cancer.
o The magnitude of the health risk from exposure to radiation depends on factors such as:
▪ how much radioactive material was use,
▪ how long you were exposed to the radioactive material,
▪ how close you were to the radioactive material, and
▪ how much shielding was between you and the radioactive material.
o Exposure to large amounts of radioactive cesium can make a person very sick, very quickly.
o The instructions given by local and state officials are to help residents best avoid this type of exposure.
• Are children and the elderly at more risk?
o While there is no evidence that children and the elderly are at more risk from exposure, the standards that we set for protecting children from radiation exposure are more stringent as a precaution.
o We are using these standards to help make decisions to protect the public.
</td></tr>
<tr><td colspan="5">Web Address: Not available.</td></tr>
<tr><td colspan="5"><u>"U.S. EPA Taps Emergency Resources to Respond in Portland":</u> A sample press release created for the TOPOFF 4 exercise that details the role EPA plays in monitoring the environment during a radiological emergency.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Print (exercise materials)</td><td>PURPOSE: Education</td><td>PHASE: During event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">
• EPA coordinates responses to radiological emergencies by monitoring air to determine the location and amount of radioactive material present. In addition, EPA's nationwide air monitoring system is now operating on an accelerated basis.
• EPA is working with our federal, state, and local partners to protect public health and the environment.
• EPA deployed experts that have specialized knowledge in radiation monitoring and assessment needed during a radiological emergency. In addition, EPA sent specialized equipment to monitor and analyze contamination in and around the incident site.
• EPA's primary role is monitoring the air, water, and soil for radioactive contamination.
• In addition, EPA is part of a multi-agency group that provides guidance to local officials on precautions that can help minimize the public's radiation exposure.
</td></tr>
<tr><td colspan="5">Web Address: Not available.</td></tr>
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U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
RadNet: Overview: Fact sheet that details the role and objectives of monitoring the nation's air, drinking water, precipitation, and pasteurized milk for environmental levels of radiation.			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** Education	**PHASE:** Pre-event
MAJOR TOPIC(S):	• RadNet provides baseline data on background levels of radiation in the environment and tracks increases above background from a variety of sources. • In response to the terrorist attack of September 11 and the new emphasis on homeland security, EPA is updating and expanding RadNet's air monitoring capability to be more responsive. • In the event of a radiological incident, EPA will initiate RadNet's emergency mode. EPA will deploy up to 40 monitors to the immediate vicinity of the incident to assess the spread of contamination and significantly decreasing the time required for detection, processing and notification from days to hours.		
Web Address: Not available.			
Office of Radiation and Indoor Air "Response Components for Radiation Emergencies": Fact sheet that describes the roles and responsibilities of the three main response components of the EPA's Office of Radiation and Indoor Air-- Radiological Emergency Response Team (RERT), RadNet, and the laboratory analytical service.			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** Education	**PHASE:** Pre-event
MAJOR TOPIC(S):	• The Radiological Emergency Response Team (RERT) and its partners provide technical advice and assistance to prevent or minimize threats to public health and the environment; advice on protective measures to ensure public health and safety; assessments of dose and impact of any release on public health and the environment; monitoring, sampling, laboratory analyses, and data assessments to characterize environmental impacts; and technical advice and assistance for containment, cleanup, restoration, and recovery following a radiological incident. • RadNet–Formerly the Environmental Radiation Air Monitoring System (ERAMS)–monitors the nation's air, drinking water, precipitation, and pasteurized milk for environmental radiation. • Laboratory Analytical Service–The National Air and Radiation Environmental Laboratory and Radiation and Indoor Environments National Laboratory provide monitoring and assessment services at the laboratory and at the scene of an accident.		
Web Address: Not available.			

<table>
<tr><th colspan="5">U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)</th></tr>
<tr><td colspan="5"><u>Commonly Encountered Radionuclides:</u> A Web page that details information on types of unstable radioactive particles that may be found in the environment, in industrial applications, or radiological events and weapons. Includes links to information pages for each of the listed radionuclides.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Web</td><td>PURPOSE: Education</td><td>PHASE: Pre-event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">• Each page lists some basic information about the following radionuclides, how exposures to each can take place, the health effects of such exposure, and protective actions that both the EOA and individuals can take.
o Americium-241
o Cesium-137
o Cobalt-60
o Iodine-129 &-131
o Plutonium
o Radium
o Radon
o Strontium-90
o Technetium-99
o Tritium
o Thorium
o Uranium</td></tr>
<tr><td colspan="5">Web Address: http://www.epa.gov/radiation/radionuclides/</td></tr>
<tr><td colspan="5"><u>PLAYBOOK: Message Maps for Radiological Emergencies:</u> A set of message maps containing information for the public to be released in the event of a radiological event.</td></tr>
<tr><td colspan="2">AUDIENCE: Health Departments; General</td><td>CHANNEL: Print</td><td>PURPOSE: Education</td><td>PHASE: Pre-event; During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td>• Background
o What is radiation?
o Where do I find radiation in everyday life?
o What does “background radiation” mean?
o What should we know about low levels or radiation?
o What is the difference between contamination and exposure?
o Are there different</td><td>o What is an Improvised Nuclear Device (IND)?
• EPA Roles
o What are EPA’s role in a radiological emergency? What are you doing to protect us?
• Sheltering
o How can I protect myself against radiation after a dirty bomb?
o How can I lessen my exposure during an emergency?</td><td>o What should I do if I think I may have been contaminated?
o What can I do to decontaminate my home?
o My pet is outside and may have been exposed or contaminated? What should I do?
• Monitoring
o How is radiation tracked?
o Who tracks radiation in an emergency?</td><td>o What is a Plume Map? How are Plume Maps used to track radiation?
o How accurate is the information in a Plume Map?
• Health Effects of Radiation Exposure
o How much radiation is safe?
o What should the public know about the health effects of radiation exposure?
o Does radiation cause</td></tr>
</table>

	types of radioactivity? What is the difference between Alpha, Beta and Gamma radiation? o What are radioisotopes? o What is ionizing radiation? o How do I detect radiation? • Exposure, Contamination, and Emergencies o What is radiation exposure and how does it occur? o What is radioactive contamination? o What is a Radiological Dispersal Devise (RDD)? o What is a dirty bomb? o What is the difference between an Improvised Nuclear Device (IND) and a dirty bomb?	o What does it mean to "shelter-in-place" and how do I do it? o Is my food and water safe? • Evacuation o How do I know if I should evacuate? o What should I do if I think I am contaminated and am asked to evacuate? o If the exposure that may be received without evacuation is only equivalent to a chest x-ray, why is evacuation necessary? o Where should I evacuate to? o When can I return to my home? • Decontamination o What is decontamination?	o What does RadNet do? o What kind of coverage does RadNet provide? o Will radiation monitor operators be exposed to elevated levels of radiation? o Who decides where to put deployable air monitors and when? o Where does information go to be analyzed? o What is EPA's laboratory capability? o What is Aerial Measuring System and what does it do? o How can the non-air portion of RadNet assist in an emergency? o How is RadNet data used? o Why should we trust EPA to monitor radiation?	cancer? o Are certain populations more vulnerable to radiation than others? o How do I know if I have been exposed to radiation and what happens if I am? o How is radiation exposure treated? o Am I at risk for radiation poisoning? o What is Potassium Iodide (KI)? o Should I take potassium iodide (KI) during a radiological emergency? o What is Acute Radiation Syndrome/Sickness (ARS)? o How do I know if I have Acute Radiation Syndrome (ARS)? • Clean-Up o What is EPA's role in a radiological emergency? What are you doing to protect us?
Web Address: Not available.				

U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
Communicating Radiation Risks: Crisis Communications for Emergency Responders Radiation Message Maps: An excerpt from *Communicating Radiation Risks: Crisis Communications for Emergency Responders* that includes message maps with information on radiation facts.			
AUDIENCE: Emergency Responders	**CHANNEL:** Print	**PURPOSE:** Response	**PHASE:** During event
MAJOR TOPIC(S):	• Basic Radiation Information o How do I detect radiation? o How can radiation exposure occur? o How much radiation is safe? o What are common sources of radiation? o What should we do about low levels of radiation? o What are the reasonable steps to take in an emergency? o What happens when I am exposed to radiation? o What is radiation exposure? o What is radioactive contamination? o Are there different types of radioactivity? o What is the difference between contamination and exposure? o How can I tell if I have been exposed? o Am I going to get cancer? • Radiological Emergencies o What type of emergency is this?		o Was this a terrorist event? o What is a dirty bomb? o What should I do if I am asked to shelter-in-place? o How can I lessen my exposure? o What should I do if I think I may have been contaminated? o What should I do if I think I am contaminated and am asked to evacuate? o My dog or cat is outside and may have been exposed or contaminated. What should I do? o I need to get my pet inside as soon as possible. What should I do if it has been contaminated? o What about livestock? o Should I take potassium iodide (KI) during a radiological emergency? o What are you doing to protect public health and the environment? o Are my food and water safe? o When can I return to my home? o Will my home be safe? o What is the role of your agency?
Web Address: Not available.			

U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
"Scenario: Improvised Nuclear Device(IND)": An EPA fact sheet that defines the term Improvised Nuclear Device (IND) and discusses its associated dangers. The fact sheet describes a likely scenario that would unfold with the detonation of an IND, and gives a list of relevant and pertinent messages that must be delivered to the public in case of this kind of radiological emergency.			
AUDIENCE: First Responders	**CHANNEL:** Print	**PURPOSE:** Response	**PHASE:** During Event
MAJOR TOPIC(S):	• "What" has happened o Definition of "Improvised Nuclear Device" • "When" it has happened • What to expect o Effects of an IND o Limited communication abilities o Blast zones	• Key messages to give to the public during this sort of event o There has been an explosion o The cloud is radioactive o Follow instructions from local authorizes o If you think you have been contaminated, shower and change your clothes	
Web Address: n/a			
"Scenario: Radiological Dispersal Device (RDD)-Dirty Bomb": An EPA fact sheet that defines the term Improvised Radiological Dispersal Device (RDD-"Dirty Bomb") and discusses its associated dangers. The fact sheet describes a likely scenario that would unfold with the detonation of an RDD, and gives a list of relevant and pertinent messages that must be delivered to the public in case of this kind of radiological emergency.			
AUDIENCE: First responders	**CHANNEL:** Print	**PURPOSE:** Response	**PHASE:** During Event
MAJOR TOPIC(S):	• "What" has happened o Definition of "Radiological Dispersal Device" • "When" it has happened • What to expect o Effects of an RDD o Radioactive dust dispersion o Health effects unlikely	• Key messages to give to the public during this sort of event o This is an explosion that has spread radioactive material o Avoid the immediate vicinity o If you have been hurt, seek help o If you think you have been contaminated, shower and change your clothes o Listen for recommendations from public safety professionals	
Web Address: Not available.			

U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
"Office of Radiation and Indoor Air: RadNet-Fixed Component":			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** General Education	**PHASE:** Pre-event
MAJOR TOPIC(S):	• Expansion of RadNet and its importance in radiation monitoring • Fixed monitoring systems will: o Send data directly to National Air and Radiation Environmental Lab automatically o Quickly monitor Alpha and Beta radiation through filters o All air filters will be comprehensibly analyzed	o This process begins in 2006–2012 o RadNet will be fully operational in 2009	
Web Address: Not available.			
"**Office of Radiation and Indoor Air: RadNet-Deployable Component":** An EPA fact sheet that describes how RadNet is pivotal in the next steps to monitoring radiation effectively and efficiently. It describes how RadNet now includes 40 deployable monitoring stations that can be used at locations after a radiological incident has occurred.			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** General Education	**PHASE:** Pre-event
MAJOR TOPIC(S):	• Expansion of RadNet and its importance in radiation monitoring • The features included in deployable radiation monitors o Low and high sampling capacities o Near-real-time satellite communication o GPS o Weather Station • The inclusion of deployable stations will help to provide radiation monitoring data in locations after a radiation emergency	• The purpose of deployable monitoring systems o Compare radiation levels to background levels • In case of an emergency, these monitors can be sent to the area • The monitors include data inscription tools for security purposes and a battery backup with a minimum 24 hr. capacity	
Web Address: Not available.			

U.S. ENVIRONMENTAL PROTECTION AGENCY (continued)			
"EPA Detect Elevated Levels of Airborne Radioactive Material _____ (Incident) Suspected": An EPA press release that reports an elevated level of radioactive material as a result of suspected incident. The press release describes the suspected event and explains the RadNet monitoring system.			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** Protective Action	**PHASE:** Response
MAJOR TOPIC(S):	• EPA detect elevated levels of airborne radioactive materials • The elevated level is related to XX event • EPA's use of mobile monitors to provide additional air sampling • RadNet was in charge of detecting this radioactive change in ambient air, and has XX amount of monitoring stations reporting and gathering data	• RadNet, (once known as the Environmental Radiation Ambient Monitoring System), was upgraded after 9/11 and monitors air, water, precipitation, and pasteurized milk. o They have worked for 60 years to provided baseline data on background levels of radiation	
Web Address: Not available.			

U.S. DEPARTMENT OF HOMELAND SECURITY			
Federal Emergency Management Agency (FEMA) Are You Ready Guide: The guide is intended for direct distribution to the public. It is designed to help the citizens learn how to protect themselves and their families against all types of hazards. It can be used as a reference source or as a step-by-step manual. The focus of the content is on how to develop, practice, and maintain emergency plans that reflect what must be done before, during, and after a disaster to protect people and their property. Also included is information on how to assemble a disaster supplies kit that contains sufficient food, water, and other supplies to help families survive the aftermath of a disaster. The guide includes a section on terrorism and has a particular section devoted to RDDs.			
AUDIENCE: General	**CHANNEL:** Print, Web	**PURPOSE:** Protective Actions	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• RDD, dirty bomb, dirty nuke • Before a RDD event • During a RDD event (indoors and outdoors) • After a RDD event • Terrorism checklist		
Web Address: http://www.fema.gov/areyouready/radiological_dispersion_device.shtm			
READY.gov: The Ready campaign has a concise Web page devoted to "Radiation Threats" and another Web page devoted to "Nuclear Threats."			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** During-Event, Post-Event
MAJOR TOPIC(S):	• RDD, dirty bomb • Limit exposure • If you are outside and there is an explosion, or if authorities warn of a radiation release nearby • If you are inside and there is an explosion near where you are, or you are warned of a radiation release inside • If you think you have been exposed to radiation • Time, distance, shielding		
Web Address: Radiation Threat: http://www.ready.gov/america/beinformed/radiation.html Nuclear Threat: http://www.ready.gov/america/beinformed/nuclear.html			

U.S. DEPARTMENT OF HOMELAND SECURITY (continued)			
Radiological Dispersion Devices Fact Sheet: A press release from 2003 about how to prepare oneself for an RDD explosion and what to do immediately after an RDD explosion.			
AUDIENCE: General	**CHANNEL:** Press Release	**PURPOSE:** Protective Actions	**PHASE:** Pre-Event, During Event
MAJOR TOPIC(S):			
• Why are RDDs a likely terrorist strategy? • How to prepare yourself o Learn all sources of warning used in your community. o Assemble and maintain a disaster supply kit with food, water, medications, fuel, and personal items adequate for up to two weeks. Keep a battery-powered radio with you to listen for official information. o Find out what public buildings in your community have been designated as fallout shelters. o If you live in an apartment building or high-rise, talk to the manager about the safest place in the building for sheltering. o Learn about your community's evacuation plans.	• What to do following an explosion o Move away from the immediate area—at least several blocks from the explosion—and go inside. This will reduce exposure to any radioactive airborne dust. o Turn on local radio or TV channels for advisories from local emergency response and health authorities. o If facilities are available, remove clothes and place them in a sealed plastic bag. Saving contaminated clothing will allow testing for exposure without invasive sampling. o Take a shower to wash off dust and dirt. This will reduce total exposure. o If radioactive material was released, local news broadcasts will advise people where to report for radiation monitoring and blood tests to determine whether they were exposed and what steps to take to protect their health.	• Physical impact o In most cases, any immediate deaths or serious injuries would likely result from the explosion itself, rather than from radiation exposure. It is unlikely that the radioactive material contained in a dirty bomb would result in direct deaths. A low-level exposure to radioactive contamination could slightly increase the long-term risk of cancer. o Use of a dirty bomb could result in radioactive contamination of several city blocks to an entire city. The extent of the contamination depends upon a number of factors including the size of the explosive, the amount and type of radioactive material used, and weather conditions. Cleanup of the contamination could cost millions of dollars and take weeks to months to complete.	• Immediate response o Because a "dirty bomb" explosion could expose people to loose radioactive material in the air, which could be inhaled, people are advised to quickly move away from the immediate area, at least several blocks from the explosion, and tune in to local radio or TV broadcasts for instructions from emergency officials. Emergency response officials will arrange medical treatment for those injured by the blast, evacuating people from the area, decontaminating those who were contaminated, and assessing any internal or external exposures. It should be noted that the use of potassium iodide would not necessarily be protective in these cases because radioactive iodine is not necessarily the isotope that would be used in these devices. The affected area will be cordoned off from surrounding areas.
Web Address: http://www.dhs.gov/xnews/releases/press_release_0085.shtm			

<table>
<tr><th colspan="5">U.S. DEPARTMENT OF HOMELAND SECURITY (continued)</th></tr>
<tr><td colspan="5"><u>Radiation Threat Visual Guide and Nuclear Threat Visual Guide:</u> Visual graphics representing step-by-step instructions in the event of potential exposure to radiation.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Web, Print</td><td>PURPOSE: Protective Actions</td><td>PHASE: During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">• Time, distance, shielding</td></tr>
<tr><td colspan="5">Web Address: <u>Radiation:</u> http://www.ready.gov/america/_downloads/radiation.pdf
<u>Nuclear:</u> http://www.ready.gov/america/_downloads/nuclear.pdf</td></tr>
<tr><td colspan="5"><u>Radiological Attack Dirty Bombs (RDD) and Other Devices</u> <u>(edition of NEWS & TERRORISM):</u> A fact sheet from the National Academies and the U.S. Department of Homeland Security that discusses the effects of dirty bombs and other devices.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Web</td><td>PURPOSE: Education, Protective Actions</td><td>PHASE: During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="2">• What is it?
o Radiological dispersal devices, a.k.a. dirty bombs
o A dirty bomb is not a nuclear bomb
o How a RDD might be used
o Detection and measurement
• What do RDDs do?
o The area affected
o Spread of a radioactive plume
• What is the danger?
o Immediate impact to human health
o Health effects of radiation exposure
o Acute radiation syndrome (ARS)
o Psychological impacts</td><td colspan="2">• What should people do to protect themselves?
o Time, distance, and shielding
o Practical steps
o Decisions regarding evacuation
o Reducing contamination
o Antidotes
• What are the long-term consequences?
o Monitoring and cleanup of affected areas
o Delayed health effects of radiation
o Economic impact</td></tr>
<tr><td colspan="5">Web Address: http://www.nae.edu/NAE/pubundcom.nsf/weblinks/CGOZ-646NVG/$file/radiological%20attack%2006.pdf</td></tr>
</table>

U.S. NUCLEAR REGULATORY COMMISSION			
What Do I Do to Prepare For a Radiological Emergency: This Web page provides information for individuals who live within a radius of approximately 10 miles from a nuclear power plant.			
AUDIENCE: General, People living near nuclear facilities	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• Emergency information materials for the public • Alert and notification system • Learn about obtaining potassium iodide		
Web Address: http://www.nrc.gov/about-nrc/emerg-preparedness/prepare-for-radiological-emerg.html			
Response to Dirty Bombs: This Web page provides the same information as "What Do I Do in a Radiological Emergency" (dirty bomb event section).			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Protective Action	**PHASE:** During Event
MAJOR TOPIC(S):	• Risk assessment information • What people should do after an explosion o Move away from the immediate area—at least several blocks from the explosion—and go inside. This will reduce exposure to any radioactive airborne dust. o Turn on local radio or TV channels for advisories from emergency response and health authorities. o If facilities are available, remove clothes and place them in a sealed plastic bag. Saving contaminated clothing will allow testing for radiation exposure. o Take a shower to wash off dust and dirt. This will reduce total radiation exposure, if the explosive device contained radioactive material. o If radioactive material was released, local news broadcasts will advise people where to report for radiation monitoring and blood and other tests to determine whether they were exposed and what steps to take to protect their health.		
Web Address: http://www.nrc.gov/about-nrc/emerg-preparedness/in-radiological-emerg.html			

<table>
<tr><th colspan="4">U.S. NUCLEAR REGULATORY COMMISSION (continued)</th></tr>
<tr><td colspan="4"><u>Backgrounder on Dirty Bombs</u>: A 7-page printable document from May 2007 about dirty bombs. The document includes FAQs and resource links.</td></tr>
<tr><td>AUDIENCE: General</td><td>CHANNEL: Web, Print</td><td>PURPOSE: Education, Protective Actions</td><td>PHASE: Pre-Event, During event, Post-Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td></td><td></td><td></td></tr>
<tr><td colspan="4">

Background
Health impact of a dirty bomb
Protective actions

Minimize the time exposed to radioactive materials
Maximize the distance from the source of radiation
Shielding from external exposure and inhaling radioactive material

Sources of radioactive material
Control of radioactive material
Risk of cancer

Resources

Department of Homeland Security
Department of Energy
Environmental Protection Agency
Nuclear Regulatory Commission
Federal Emergency Management Agency
Department of Justice
Federal Bureau of Investigation
Department of Health and Human Services
Transportation Security Administration
National Nuclear Security Administration

FAQs

What is an RDD or ”dirty bomb”?
What is radiation?
Are terrorists interested in radioactive materials?
Will an RDD make me sick?
How can I protect myself in a radiation emergency?
If I'm told NOT to take public transportation when evacuating from an RDD attack, what about using my personal vehicle?
I was a mile from the explosion—am I going to be sick?
Will it be safe to clean my home and continue to live in it during and after such an RDD explosion?
Should I buy a radiation detector?
Should I purchase potassium iodide tablets for protection against radiation?

</td></tr>
<tr><td colspan="4">Web Address: http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/dirty-bombs-bg.html</td></tr>
<tr><td colspan="4"><u>Fact Sheet on Dirty Bombs:</u> A 3-page fact sheet about dirty bombs created in March 2003.</td></tr>
<tr><td>AUDIENCE: General</td><td>CHANNEL: Web, Print</td><td>PURPOSE: Education, Protective Actions</td><td>PHASE: During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="3">

Background
Impact of a dirty bomb
Sources of radioactive material
Control of radioactive material
What people should do following an explosion

Move away from the immediate area—at least several blocks from the explosion—and go inside. This will reduce exposure to any radioactive airborne dust.
Turn on local radio or TV channels for advisories from emergency response and health authorities.
If facilities are available, remove clothes and place them in a sealed plastic bag. Saving contaminated clothing will allow testing for radiation exposure.
Take a shower to wash off dust and dirt. This will reduce total radiation exposure, if the explosive device contained radioactive material.
If radioactive material was released, local news broadcasts will advise people where to report for radiation monitoring and blood and other tests to determine whether they were exposed and what steps to take to protect their health.

Risk of cancer

</td></tr>
<tr><td colspan="4">Web Address: http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/dirty-bombs.html</td></tr>
</table>

CENTER FOR INTERNATIONAL SECURITY AND COOPERATION INSTITUTE FOR INTERNATIONAL STUDIES, STANFORD UNIVERSITY			
Understanding the Risks and Realities of Nuclear Terrorism: A 21-page backgrounder describing nuclear explosions, RDD "dirty bombs," and attacks on nuclear facilities. The document includes a radiation primer, response guidance, and references and resources.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Actions	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• Summary of major nuclear threats (dirty bombs, attacks on nuclear facilities, attacks using nuclear weapons) • A radiation primer • Sources of radiation • Radiation in professional life • Medical uses of radiation • Effects of overexposure • Damages caused by nuclear and radiological threats (nuclear explosions, dirty bombs/RDDs, nuclear facilities)		
Web Address: http://cisac.stanford.edu/publications/understanding_the_risks_and_realities_of_nuclear_terrorism/			
Dirty Bombs Fact Sheet: This fact sheet provides answers to many of the most frequently asked questions about dirty bombs. It includes information on what the public can do to both prepare for and work to prevent nuclear terrorist attacks.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• What is a dirty bomb? • What is the damage caused by a dirty bomb? • What would be the effects of this level of radiation exposure? • What are the biggest dangers of a dirty bomb? • If it is no more effective than a conventional bomb, why would it be used by a terrorist? • How hard is it to make a dirty bomb? • What should the public do in the event of a dirty bomb explosion? • How likely is an attack?		
Web Address: http://iis-db.stanford.edu/pubs/20769/dirty_bomb_facts.pdf			
Radiation Fact Sheet: This fact sheet provides answers to many of the most frequently asked questions about radiation. It includes information on what the public can do to both prepare for and work to prevent nuclear terrorist attacks.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• What is radiation? • How are Americans exposed to radiation? • How do these types of radiation differ? • What can I do to minimize radiation exposure? • Time, distance, shielding		
Web Address: http://cisac.stanford.edu/publications/radiation/			

<table>
<tr><th colspan="5">RAND PUBLIC SAFETY AND JUSTICE PROGRAM</th></tr>
<tr><td colspan="5"><u>Individual Preparedness and Response to Chemical, Radiological, Nuclear, and Biological Terrorist Attacks:</u> This 161-page book is intended to provide guidance for individuals to protect themselves in the event of an actual terrorist attack (aerial release of anthrax over a city, dispersal of smallpox in an indoor arena, sarin gas release outside a famous building, and a nuclear weapon detonation in a large city).</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Print (Book)</td><td>PURPOSE: Education, Protective Action</td><td>PHASE: Pre-Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4"><u>“What You Should Do to Prepare for and Respond to Chemical, Radiological, Nuclear, and Biological Terrorist Attacks” Reference Card</u></td></tr>
<tr><td colspan="5">Web Address: http://www.rand.org/pubs/monograph_reports/MR1731/</td></tr>
<tr><td colspan="5"><u>“What You Should Do to Prepare for and Respond to Chemical, Radiological, Nuclear, and Biological Terrorist Attacks” Reference Card</u>: This 8-sided foldable pocket guide is a summary of the essential features of the strategy described in the Individual Preparedness and Response to Chemical, Radiological, Nuclear, and Biological Terrorist Attacks.</td></tr>
<tr><td colspan="2">AUDIENCE: General</td><td>CHANNEL: Print (Pocket Guide)</td><td>PURPOSE: Protective Action</td><td>PHASE: Pre-Event, During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">For radiological attack:
What will you experience
What you should do
The overarching goal is to avoid inhaling dust that could be radioactive
Response actions
If an explosion occurs outdoors, or you are outdoors and are informed of an outside release of radiation…
If an explosion occurs inside your building, or you are informed of a release of radiation…
Decontaminate by removing clothing and showering
Relocate outside the contaminated zone, only if instructed to do so by public officials.</td></tr>
<tr><td colspan="5">Web Address: http://www.rand.org/pubs/monograph_reports/2005/MR1731.2.pdf</td></tr>
</table>

THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)			
Factsheet: Radiation in Everyday Life: Electronic fact sheet that includes information on radiation.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• Types of radiation • Radiation doses • Radiation protection	• At what level is radiation harmful? • Risks and benefits of radiation	
Web Address: http://www.iaea.org/Publications/Factsheets/English/radlife.html			
Flyer for the General Public: A multi-page document that provides an overview of what sealed radioactive sources are, information on radiation, and advice on what to do should a source be found. The flyer is one component of *The Sealed Radioactive Sources Communications Toolkit*, a toolkit developed by the IAEA to help improve communication with key groups about safety and security issues related to sealed radioactive sources. The toolkit also includes some fundamental informational materials, like this flyer, for the general public.			
AUDIENCE: General	**CHANNEL:** Print	**PURPOSE:** Education	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• What sealed radioactive sources are • Information on radiation • Advice on what to do should a source be found		
Web Address: http://www.iaea.org/Publications/Booklets/SealedRadioactiveSources/pdfs/flyer_public.pdf			

THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) (continued)			
The Sealed Radioactive Sources Communications Toolkit: The IAEA developed this toolkit to help improve communication with key groups about safety and security issues related to sealed radioactive sources; however the toolkit also includes some fundamental informational materials, like this one, for the general public. The toolkit is a starting point for communication on safety and security matters relating to sealed radioactive sources.			
AUDIENCE: PH Officials, Government, General	**CHANNEL:** Toolkit	**PURPOSE:** Education	**PHASE:** Pre-Event
MAJOR TOPIC(S):	The toolkit contains the following: • A handout for medical users of sources; provides a summary of relevant accidents and provides advice on best practices when using sources in medical procedures; • A handout for industrial users of sources; provides a summary of relevant industrial accidents and guidance on preventing the loss of industrial sources; • A handout for those working in the scrap metal industry; provides a summary of relevant scrapyard accidents, an overview of what sealed radioactive sources are, advice on how to recognize a sealed source, and what to do should one be found; • A handout for government agencies; provides an overview of how to maintain effective control over sealed sources, as well as the long term management challenges for government • A flyer for the general public; provides an overview of what sealed radioactive sources are, information on radiation and advice on what to do should a source be found; • A fact sheet on radiation and radioactive sources; provides a general overview of radiation and radioactive sources and is intended as background information for non-technical or low technical audiences, such as the media, general public or workers in scrap metal industry; • A fact sheet on IAEA activities; provides a summary of key IAEA activities related to sealed radioactive sources and is intended as a reference for those working in government agencies; • A fact sheet on key IAEA publications related to sealed sources; provides a summary of key IAEA publications on this topic; • A poster for educating members of the public on the trefoil symbol used to identify radiation hazards.		
Web Address: http://www.iaea.org/Publications/Booklets/SealedRadioactiveSources/pdfs/instructionguide.pdf			

THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) (continued)			
New Supplemental Radiation Warning Symbol: The new symbol, the result of a five-year project conducted in 11 countries around the world, is aimed at alerting anyone, anywhere to the potential dangers of being close to a large source of ionizing radiation. It was tested with different population groups—mixed ages, varying educational backgrounds, males and females—to ensure that its message of "danger—stay away" was crystal clear and understood by all.			
AUDIENCE: General	**CHANNEL:** Print (Alert Symbol)	**PURPOSE:** Alert	**PHASE:** During Event
MAJOR TOPIC(S):	With radiating waves, a skull and crossbones, and a running person, the new ionizing radiation warning symbol was introduced to supplement the traditional international symbol for radiation, the three-cornered trefoil. 		
Web Address: http://www.iaea.org/NewsCenter/News/2007/radiationsymbol.html			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC)			
FAQ About a Radiation Emergency: How you can protect yourself and your family in a radiation emergency.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** During Event
MAJOR TOPIC(S):	• What is radiation? o Defines radiation and its measurement • How can exposure occur? o Addresses exposure and internal and external contamination from natural sources (i.e. sunlight) and man-made sources (i.e., microwaves, nuclear testing) • What happens when people are exposed to radiation? o Explains effects of radiation exposure • What types of terrorist events might involve radiation? o Describes possible terrorist tactics including dirty bombs, destroying a nuclear facility, and/or exploding a small nuclear device • What preparations can I make for a radiation emergency? o Discusses emergency plans in school, home, and community • How can I protect myself during a radiation emergency? o Highlights action steps/directives during an emergency: shelter in place and evacuation • Should I take potassium iodide during a radiation emergency? o Discusses purpose of potassium iodine		
Web Address: http://www.emergency.cdc.gov/radiation/emergencyfaq.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Dirty Bombs: FAQ about a terrorist attack with a conventional weapon that has radioactive material in it.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** Pre-Event, During Event
MAJOR TOPIC(S):			

- What is a dirty bomb?
- What are the main dangers of a dirty bomb?
- What immediate actions should I take to protect myself?
- If you are outside and close to the incident:
  - Cover your nose and mouth with a cloth to reduce the risk of breathing in radioactive dust or smoke.
  - Don't touch objects thrown off by an explosion—they might be radioactive.
  - Quickly go into a building where the walls and windows have not been broken. This area will shield you from radiation that might be outside.
  - Once you are inside, take off your outer layer of clothing and seal it in a plastic bag if available. Put the cloth you used to cover your mouth in the bag, too. Removing outer clothes may get rid of up to 90% of radioactive dust.
  - Put the plastic bag where others will not touch it and keep it until authorities tell you what to do with it.
  - Shower or wash with soap and water. Be sure to wash your hair. Washing will remove any remaining dust.
  - Tune to the local radio or television news for more instructions.
- If you are inside and close to the incident:
  - If the walls and windows of the building are not broken, stay in the building and do not leave.
  - To keep radioactive dust or powder from getting inside, shut all windows, outside doors, and fireplace dampers. Turn off fans and heating and air-conditioning systems that bring in air from the outside. It is not necessary to put duct tape or plastic around doors or windows.
  - If the walls and windows of the building are broken, go to an interior room and do not leave. If the building has been heavily damaged, quickly go into a building where the walls and windows have not been broken. If you must go outside, be sure to cover your nose and mouth with a cloth. Once you are inside, take off your outer layer of clothing and seal it in a plastic bag if available. Store the bag where others will not touch it.
  - Shower or wash with soap and water, removing any remaining dust. Be sure to wash your hair.
  - Tune to local radio or television news for more instructions.
- If you are in a car when the incident happens:
  - Close the windows and turn off the air conditioner, heater, and vents.
  - Cover your nose and mouth with a cloth to avoid breathing radioactive dust or smoke.
  - If you are close to your home, office, or a public building, go there immediately and go inside quickly.
  - If you cannot get to your home or another building safely, pull over to the side of the road and stop in the safest place possible. If it is a hot or sunny day, try to stop under a bridge or in a shady spot.
  - Turn off the engine and listen to the radio for instructions.
  - Stay in the car until you are told it is safe to get back on the road.
- What should I do about my children and family?
- How do I protect my pets?
- Should I take potassium iodide?
- Will food and water supplies be safe? How do I know if I've been exposed to radiation or contaminated by radioactive materials?

Web Address: http://www.emergency.cdc.gov/radiation/dirtybombs.asp

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Sheltering in Place During a Radiation Emergency: When and how you need to shelter in place during a radiation emergency.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Protective Action	**PHASE:** Pre-Event, During Event
MAJOR TOPIC(S):	• Preparing a shelter in your home • Preparing emergency supplies • Tips before entering a shelter		
Web Address: http://www.emergency.cdc.gov/radiation/shelter.asp			
Facts About Evacuation During a Radiation Emergency: This fact sheet will help you decide on the best actions to protect yourself and your family during a radiation emergency.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Protective Action	**PHASE:** During Event
MAJOR TOPIC(S):	• What you should do during a radiation emergency • What you should do if you are told to take shelter where you are • How to know whether to evacuate • Why you may be told *not* to evacuate • What to do if you're told to evacuate • What you should bring to the emergency shelter • What you should do with your pets • What to do if you live near a nuclear power plant • Where you can get more information about evacuation		
Web Address: http://www.emergency.cdc.gov/radiation/evacuation.asp			
Nuclear Blast: FAQs about what a nuclear blast is and how to protect yourself.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** During Event

MAJOR TOPIC(S):	• What is a nuclear blast?
	• What are the effects of a nuclear blast?
	• How can I protect my family and myself during a nuclear blast?
	  o If you are near the blast when it occurs
	  o If you are outside when the blast occurs
	  o If you are already in a shelter or basement
	  o If you are advised to evacuate
	• Is a nuclear bomb the same as a suitcase bomb?
	• Is a nuclear bomb the same as a dirty bomb?
	• Would an airplane crash in a nuclear power plant have the same effect as a nuclear blast?
	• Do I need to take potassium iodide (KI) if there is a nuclear blast?		

Web Address: http://www.emergency.cdc.gov/radiation/nuclearfaq.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Radioactive Contamination & Radiation Exposure: Provides information on the basics of radiation contamination and radiation exposure and the differences between the two.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education, Protective Action	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• What radioactive contamination is • What external contamination is • What internal contamination is • What radiation exposure is • How contamination differs from exposure • How exposure or contamination can happen • How radioactive contamination is spread • How your home could become contaminated • How you can limit contamination o Get out of the immediate area quickly. o Remove the outer layer of your clothing. o If possible, place the clothing in a plastic bag or leave it in an out-of-the-way area, such as the corner of a room. o Wash all of the exposed parts of your body using lots of soap and lukewarm water to remove contamination. This process is called decontamination. • After authorities determine that internal contamination may have occurred, you may be able to take medication to reduce the radioactive material in your body.		
Web Address: http://www.emergency.cdc.gov/radiation/contamination.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continue			
Potassium Iodide (KI): Provides information about when you should use KI in a radiation emergency.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):			
• What is potassium iodide (KI)? • What does KI do? • What KI cannot do • How does KI work? • How well does KI work?	• Who should take KI? o **Infants (including breast-fed infants)**: Infants need to be given the recommended dosage of KI for babies. o **Children**: The FDA recommends that all children internally contaminated with (or likely to be internally contaminated with) radioactive iodine take KI, unless they have known allergies to iodine. o **Young Adults**: The FDA recommends that young adults (between the ages of 18 and 40 years) internally contaminated with (or likely to be internally contaminated with) radioactive iodine take the recommended dose of KI. o **Pregnant Women**: Because all forms of iodine cross the placenta, pregnant women should take KI to protect the growing fetus. However, pregnant women should take only one dose of KI following internal contamination with (or likely internal contamination with) radioactive iodine. o **Breastfeeding Women**: Women who are breastfeeding should take only one dose of KI if they have been internally contaminated with (or are likely to be internally contaminated with) radioactive iodine. Because radioactive iodine quickly gets into breast milk, CDC recommends that women internally contaminated with (or are likely to be internally contaminated with) radioactive iodine stop breastfeeding and feed their child baby formula or other food if it is available. If breast milk is the only food available for an infant, nursing should continue. o **Adults**: Adults older than 40 years should not take KI unless public health or emergency management officials say that contamination with a very large dose of radioactive iodine is expected.	• When should I take KI? • How much KI should I take? • How often should I take KI? • Medical conditions that may make it harmful to take KI • What are the possible risks and side effects of KI? • Where can I get KI?
Web Address: http://www.emergency.cdc.gov/radiation/ki.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
DTPA: Provides facts about diethylenetriaminepentaacetate (DTPA) and how it can remove select radioactive materials from people's bodies.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	• What DTPA Is • What does DTPA do? • What DTPA cannot do • How does DTPA work? • How well does DTPA work? • Who should get DTPA? • How should DTPA be given? • How often will I need to get DTPA? • Medical conditions that might make it harmful to receive DTPA • What are the possible risks and side effects of DTPA? • Where can I get DTPA?		
Web Address: http://www.emergency.cdc.gov/radiation/dtpa.asp			
Prussian Blue: Provides facts about Prussian blue and how Prussian blue can remove select radioactive materials from people's bodies.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	• Facts about Prussian blue • What Prussian blue is • Use of Prussian blue to treat radioactive contamination • How Prussian blue works • Who can take Prussian blue • How Prussian blue is given • Side effects of Prussian blue • Where you can get Prussian blue		
Web Address: http://www.emergency.cdc.gov/radiation/prussianblue.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Neupogen®: Provides basic facts about what it is and how it is used.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	• What Neupogen® is • What cytokines are • Use of Neupogen® to treat persons accidentally exposed to high doses of radiation • How Neupogen® works • Who can take Neupogen® • Side effects of Neupogen® • How Neupogen® is given • What the treatment plan is		
Web Address: http://www.emergency.cdc.gov/radiation/neupogenfacts.asp			
What We Learn About Radiation Threats from Movies—Fact or Fiction: Addresses misconceptions and answers questions about radiation threats.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	Many recent writers of fictional film and television programs and movies have chosen threats from radiation as the central theme of their story lines. The television drama "Dirty War," screened on HBO and PBS in 2005, is a recent example of this type of terrorism story. Telling the story of a dirty bomb in film or on television creates challenges for the writers and for audiences. Because of the immediacy of the film medium, scientific and medical facts have to be dramatized, which might leave the audience with some questions about the type of threat posed by a dirty bomb.		
Web Address: http://www.emergency.cdc.gov/radiation/movies.asp			
Population Monitoring After a Release of Radioactive Material: Provides information about how public health officials would monitor people following a radiological incident and how this monitoring could be used to protect people's health.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	• What "population monitoring" is • Plans for population monitoring • What CDC is doing		
Web Address: http://emergency.cdc.gov/radiation/populationmonitoring.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Acute Radiation Syndrome: Provides information about what you need to know about radiation sickness.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	Radiation sickness, known as acute radiation syndrome (ARS), is a serious illness that occurs when the entire body (or most of it) receives a high dose of radiation, usually over a short period of time. People exposed to radiation will get ARS only if: • The radiation dose was high (doses from medical procedures such as chest X-rays are too low to cause ARS; however, doses from radiation therapy to treat cancer may be high enough to cause some ARS symptoms), • The radiation was penetrating (that is, able to reach internal organs), • The person's entire body, or most of it, received the dose, and • The radiation was received in a short time, usually within minutes. The first symptoms of ARS typically are nausea, vomiting, and diarrhea. People with ARS typically also have some skin damage. The chance of survival for people with ARS decreases with increasing radiation dose.		
Web Address: http://emergency.cdc.gov/radiation/ars.asp			
Radiation Exposure to Unborn Babies: Provides information about how radiation exposure affects pregnant women and their unborn babies.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Post-Event
MAJOR TOPIC(S):	The exposure of an unborn baby to radiation is referred to as prenatal radiation exposure. Radioactive materials may pass from the mother's blood to the baby through the umbilical cord or concentrate in areas of the mother's body near the womb (such as the urinary bladder) and expose the unborn baby to radiation. • Radiation exposure before birth can increase a person's risk of getting cancer later in life. • Health effects other than cancer from radiation exposure are not likely when the dose to the unborn baby is very low. • During the first two weeks of pregnancy, the radiation-related health effect of greatest concern is the death of the baby. • Large radiation doses to the unborn baby during the more sensitive stages of development (between weeks 2 and 15 of pregnancy) can cause birth defects, especially to the brain. • Between the 16th week of pregnancy and birth, radiation-induced health effects (besides cancer) are unlikely unless the unborn baby receives an extremely large dose of radiation. • After the 26th week of pregnancy, the radiation sensitivity of the unborn baby is similar to that of a newborn.		
Web Address: http://emergency.cdc.gov/radiation/prenatal.asp			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Radioactive Isotopes: Provides information about isotopes that might be used in a terrorist attack.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event, During Event
MAJOR TOPIC(S):	Presents information on the following isotopes: • Americium-241 (Am-241) • Cesium-137 (Cs-137) • Cobalt-60 (Co-60) • Iodine-131 (I-131) • Iridium-192 (Ir-192) • Plutonium • Polonium 210 • Strontium-90 (Sr-90) • Uranium-235 (U-235) & Uranium-238 (U-238)		
Web Address: http://emergency.cdc.gov/radiation/isotopes/			
Radiation Measurement: Provides an explanation of measurement units with examples of common radiation exposures.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• Units of measure • Measuring emitted radiation • Measuring radiation dose • Measuring biological risk • Abbreviations for radiation measurements • Common radiation exposures		
Web Address: http://emergency.cdc.gov/radiation/measurement.asp			
Glossary of Radiological Terms: Provides definitions of terms used throughout this site.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• Includes a primer on radiation measurement		
Web Address: http://emergency.cdc.gov/radiation/glossary.asp			

<table>
<tr><th colspan="5">U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)</th></tr>
<tr><td colspan="5"><u>Communicating in the First Hours—Nuclear Weapons:</u> Short and extended messages intended for use by public health officials during the first hours after a suspected nuclear weapon emergency. The short messages include essential information to help minimize the immediate risk to the public from an attack. The extended messages also include general information that can be used as a resource for officials in developing messages tailored to a specific situation.</td></tr>
<tr><td colspan="2">AUDIENCE: PH Officials</td><td>CHANNEL: Web</td><td>PURPOSE: Protective Actions, Education</td><td>PHASE: During Event, Post-Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">• What is happening?
• What should I do right now?
o What to do if you are indoors
o What to do if you are outdoors
o What to do if you are driving
o What to do if you have minor injuries or think you have been exposed to radiation
• What is a nuclear weapon explosion?
• What type of injuries could occur from a nuclear weapon explosion?
• Can the illness caused by radiation be spread from person to person?
• How are the effects of a nuclear explosion treated?
• What is being done and how to get more information?</td></tr>
<tr><td colspan="5">Web Address: http://www.emergency.cdc.gov/firsthours/nuclearweapon/index.asp</td></tr>
<tr><td colspan="5"><u>Communicating in the First Hours—Dirty Bombs: Short and Extended Messages:</u> Messages intended for use by public health officials during the first hours after a suspected dirty bomb emergency. The short messages include essential information to help minimize the immediate risk to the public from an attack. The extended messages also include general information that can be used as a resource for officials in developing messages tailored to a specific situation.</td></tr>
<tr><td colspan="2">AUDIENCE: PH Officials</td><td>CHANNEL: Web</td><td>PURPOSE: Protective Actions</td><td>PHASE: During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">Messages conveyed during the first hours after a suspected dirty bomb emergency
• What is happening?
• What is a dirty bomb?
• What to do if you are in the immediate area of the blast and have been severely injured
• What to do if you are in the immediate area of the blast but have not been injured or you have minor injuries
• How can I help protect myself indoors?
• What is being done and how to get more information</td></tr>
<tr><td colspan="5">Web Address: http://www.emergency.cdc.gov/firsthours/dirtybomb/messages.asp</td></tr>
<tr><td colspan="5"><u>Communicating in the First Hours—Dirty Bombs: Short and Long Radio Scripts:</u> For use in the first hours following an attack.</td></tr>
<tr><td colspan="2">AUDIENCE: PH Officials</td><td>CHANNEL: Web</td><td>PURPOSE: Protective Actions</td><td>PHASE: During Event</td></tr>
<tr><td>MAJOR TOPIC(S):</td><td colspan="4">Provides immediate directives during the first hours after a suspected dirty bomb emergency; addresses the same topics presented in the short and extended messages.</td></tr>
<tr><td colspan="5">Web Address: http://www.emergency.cdc.gov/firsthours/pdf/live_read_dirtybomb.pdf</td></tr>
</table>

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (CDC) (continued)			
Communicating in the First Hours—Dirty Bombs: Slates, B-roll, and Sound Bites: For broadcast media use.			
AUDIENCE: Broadcast Media	**CHANNEL:** Web	**PURPOSE:** Protective Actions	**PHASE:** During Event
MAJOR TOPIC(S):	Provides immediate directives during the first hours after a suspected dirty bomb emergency; addresses the same topics presented in the short and extended messages.		
Web Address: http://www.emergency.cdc.gov/firsthours/dirtybomb/video.asp			
Communicating in the First Hours—Dirty Bombs: Creative Brief: A creative brief for terrorist events involving radioactive material, developed by S. M. Becker during the PEMD project.			
AUDIENCE: PH Officials	**CHANNEL:** Web	**PURPOSE:** Protective Actions	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	Provides guidance for risk communicators to develop messages for radiological terrorist attacks that include protective actions, special considerations/potential obstacles, tone, creative considerations, and more.		
Web Address: http://www.emergency.cdc.gov/firsthours/pdf/creativebrief_radioactive_materials.pdf			

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES)			
Protecting Yourself During a Dirty Bomb Response: An Awareness Level Training Tool for Skilled Support Personnel: This training tool is an awareness-level health and safety resource for "skilled support personnel" who will participate in a dirty bomb response.			
AUDIENCE: First responders/Emergency personnel	**CHANNEL:** Web, Print (booklet)	**PURPOSE:** Education, Protective Action	**PHASE:** Pre-Event
MAJOR TOPIC(S):	• Radiological Dispersion Device (RDD) "Dirty Bomb" Awareness • Dirty Bomb (RDD) radioactivity basics • Controlling hazards during a dirty bomb response		
Web Address: http://www.cdphe.state.co.us/epr/Public/WIPP/RDDPrepBooklet.pdf			

HEALTH PHYSICS SOCIETY			
Weapon of Mass Destruction—Radiological Events: A fact sheet that defines RDDs and addresses the role of first responders.			
AUDIENCE: General	**CHANNEL:** Web	**PURPOSE:** Education	**PHASE:** Pre-Event, During Event, Post-Event
MAJOR TOPIC(S):	• What is a weapon of mass destruction? • What does a weapon of mass destruction look like? • What is a "dirty bomb" or radiological dispersal device (RDD)? • What is an "improvised nuclear device" (IND)? • What can the first responders, firemen, and police do at a WMD event?		
Web Address: http://hps.org/hsc/documents/wmd_factsheet.pdf			

U.S. DEPARTMENT OF ENERGY
No public-facing communications information on radiological emergencies found.

U.S. DEPARTMENT OF EDUCATION
No public-facing communications information on radiological emergencies found.

NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS
No public-facing communications information on radiological emergencies found.

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD)
No public-facing communications information on radiological emergencies found.

Appendix D
Glossary of Frequently Used Terms

GLOSSARY OF FREQUENTLY USED TERMS[3]

All-hazards approach	An approach to emergency preparedness that emphasizes steps that increase preparedness for any type of hazard, not just a specific type of hazard such as an improvised nuclear device.
Biological emergencies	An emergency involving a biological agent, including *bioterrorism*. A bioterrorism attack is the deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plants.
Chemical emergencies	When a hazardous chemical has been released and the release has the potential for harming people's health. Chemical releases can be unintentional, as in the case of an industrial accident, or intentional, as in the case of a terrorist attack.
Cobalt-60 (Co-60)	A radioisotope. Radioactive Co-60 is produced commercially through linear acceleration for use in medicine and industry. Co-60 also is a byproduct of nuclear reactor operations, when metal structures, such as steel rods, are exposed to neutron radiation.Co-60 occurs as a solid material and might appear as small metal disks or in a tube, enclosed at both ends, that holds the small disks. Co-60 can occur as a powder if the solid sources have been ground or damaged.
Emergency Support Function 15 (ESF-15)	Emergency Support Functions (ESFs) are "used by the Federal Government and many State governments as the primary mechanism at the operational level to organize and provide assistance. ESFs align categories of resources and provide strategic objectives for their use. ESFs utilize standardized resource management concepts such as typing, inventorying, and tracking to facilitate the dispatch, deployment, and recovery of resources before, during, and after an incident."[4] "ESF #15 coordinates Federal actions to provide the required external affairs support to Federal, State, tribal, and local incident management elements. This annex details the establishment of support positions to coordinate communications to various audiences."[5]
Exposure	Radioactive materials give off a form of energy that travels in waves or particles. This energy is called radiation. When a person is exposed to radiation, the energy penetrates the body. For example, when a person has an x-ray, he or she is exposed to radiation.
Improvised nuclear device (IND)	"A nuclear weapon made from illegally obtained fissile materials or a nuclear weapon obtained illicitly. An improvised nuclear device is designed to inflict maximum destruction by fissioning atoms and uranium, or plutonium, releasing vast amounts of energy in the forms of a blast, heat, and radiation. Fissile materials are capable of being made into nuclear bombs." [6]

[3] Unless otherwise stated, all definitions are taken from the Centers for Disease Control and Prevention Emergency Preparedness and Response Web site (http://emergency.cdc.gov).
[4] Federal Emergency Management Agency. Glossary. NRF Resource Center. Retrieved April 11, 2009 from http://www.fema.gov/emergency/nrf/glossary.htm#E.
[5] Department of Homeland Security. (2008). *Emergency support function #15—External Affairs Annex*. ESF #15-1.
[6] United States Environmental Protection Agency. (2007). *Communicating radiation risks: Crisis communications for emergency responders*. EPA-402-F-07-008.

Message maps	Message maps are sets of organized statements or messages that address likely questions and concerns in an emergency. Message maps are used to structure messages in order to convey complex information, and to make it easier to understand. Most message maps contain a primary message and three supporting messages that can be used to provide context for the primary message.[7]
National Incident Communications Conference Line (NICCL calls)	NICCL calls are used to disseminate and exchange critical and timely incident information among Federal and affected state, local, and tribal authorities.[8]
Office of Management and Budget (OMB) clearance[9]	This phrase refers to the OMB Paperwork Reduction Act Clearance. OMB PRA clearance is required to conduct federally sponsored data collections. The Paperwork Reduction Act (44 U.S.C. 3501 et seq.) of 1995 grants authority to OMB to review and approve federally sponsored data collections involving 10 or more respondents. The implementing regulations for the PRA can be found in 5 CFR 1320. The purpose of the Paperwork Reduction Act is to ensure that the federal government is not duplicative in paperwork requests made to the public and that the paperwork is necessary to Government business.
Plume	A plume is the material spreading from a particular source and traveling through environmental media, such as air or ground water. For example, a plume could describe the dispersal of particles, gases, vapors, and aerosols in the atmosphere, or the movement of contamination through an aquifer (e.g., dilution, mixing, or adsorption onto soil).
Radiation	Radiation is energy moving in the form of particles or waves. Familiar radiations are heat, light, radio waves, and microwaves. *Ionizing radiation* is a very high-energy form of electromagnetic radiation.
Radioactive Contamination	Occurs when radioactive material is deposited on or in an object or a person. Radioactive materials released into the environment can cause air, water, surfaces, soil, plants, buildings, people, or animals to become contaminated. A contaminated person has radioactive materials on or inside their body.
Radiological dispersal device (RDD)	An RDD is a device that disperses radioactive material by conventional explosive or other mechanical means, such as a spray. It is commonly referred to as a *dirty bomb*.
Radiological exposure device (RED)	An RED is also known as a "hidden sealed source." "An RED is a terrorist device intended to expose people to significant doses of ionizing radiation without their knowledge. Constructed from partially or fully unshielded radioactive material, an RED could be hidden from sight in a public place (e.g., under a subway seat, in a food court, or in a busy hallway), exposing those who sit or pass close by. If the seal around the source were broken and the radioactive contents released from the container, the device could become a radiological dispersal device (RDD), capable of causing radiological contamination."[10]

[7] United States Environmental Protection Agency. (2008). *Homeland security research: Message mapping.* Retrieved April 11, 2009 from http://www.epa.gov/nhsrc/news/news040207.html.
[8] Federal Emergency Management Agency. (2007). *Basic guidance for public information officers*. FEMA 517.
[9] From the CDC Office of Science Coordination and Innovation Web site. (http://www.cdc.gov/od/science/regs/reducePublicBurden/index.htm)
[10] U.S. Department of Health and Human Services. (2009). Dictionary of radiological terms. Retrieved April 14, 2009 from http://remm.nlm.gov/dictionary.htm#rdd.

Shelter-in-place	Occurs when people who live near but not in the immediate area of an attack are asked to stay home and take shelter rather than try to evacuate.
TOPOFF 4	Top Officials (TOPOFF) is a national terrorism preparedness exercise involving top officials at every level of government and representatives from the private sector and international community. TOPOFF 4 took place in October 2007. The scenario involved three coordinated terrorist attacks involving RDDs in two major U.S. metropolitan areas and one U.S. territory.[11]

[11] Department of Homeland Security. (2008). *TOPOFF: Exercising national preparedness*. Retrieved April 11, 2009 from http://www.dhs.gov/xprepresp/training/gc_1179350946764.shtm.

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