

RADIOLOGICAL THREAT AWARENESS

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

SOURCE CATEGORIES (CATs)

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

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

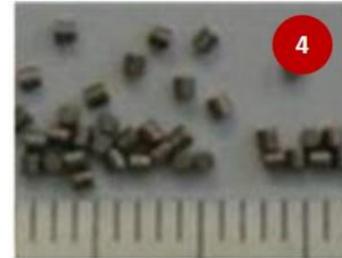
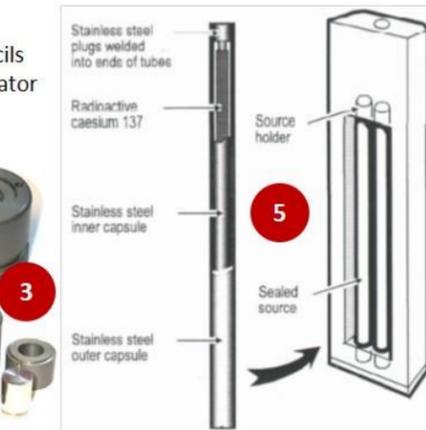
CAT 3
DANGEROUS
 Permanent injury if handle or in close contact with this source for hours

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

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

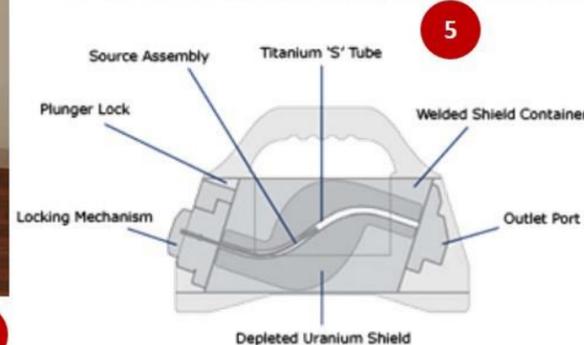
CAT 1 SOURCES – RESEARCH AND MEDICAL

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



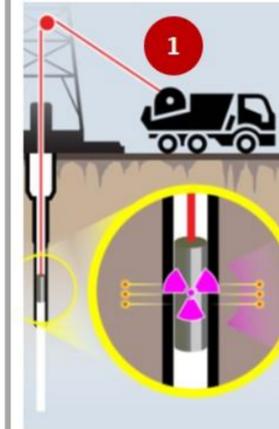
CAT 2 SOURCES – INDUSTRIAL AND MEDICAL

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



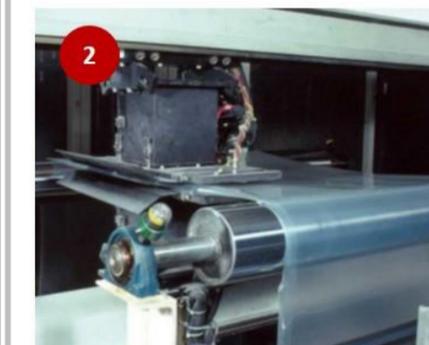
CAT 3 SOURCES - INDUSTRIAL

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



CAT 4 SOURCES - INDUSTRIAL

1. Density gauge
2. Thickness measurement gauge



CAT 5 SOURCES - COMMERCIAL

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



NOTICE: This is a Joint Counterterrorism Assessment Team (JCAT) publication. JCAT is a collaboration by the NCTC, DHS and FBI to improve information sharing among federal, state, local, tribal, territorial governments and private sector partners, in the interest of enhancing public safety. This product is **NOT** in response to a specific threat against the United States. It provides general awareness of, considerations for, and additional resources related to terrorist tactics, techniques and procedures, whether domestic or overseas. Consider the enclosed information within existing laws, regulations, authorities, agreements, policies or procedures. For additional information, contact us at JCAT@NCTC.GOV. **This poster is best printed on 11x17.**

AUTHORED BY NCTC, DHS, FBI
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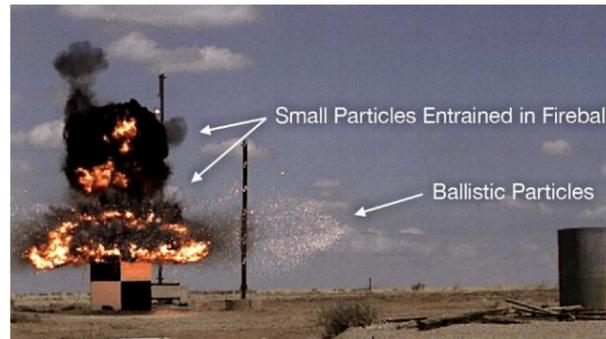
RADIOLOGICAL THREAT AWARENESS (continued)

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

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

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

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



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



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

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

RECOGNITION:

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

NOTIFICATION:

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

MULTIAGENCY RESPONSE:

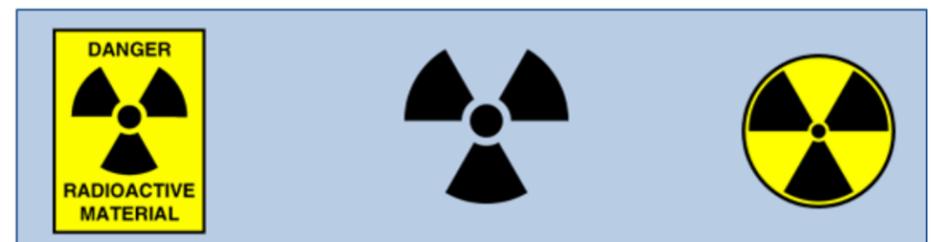
- Conduct lifesaving rescue operations.
- Remove response personnel who may be pregnant.
- Locate, isolate, triage, and decontaminate possible exposure(s).
- Secure the area, control any remaining sources, establish a security zone and crime scene.
- Establish HOT, WARM, and COLD zones on the basis of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

EVACUATION AND MONITORING:

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

RESOURCES:

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



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