



BACKGROUND

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Dirty Bombs

A “dirty bomb” is a type of “radiological dispersal device” that combines a conventional explosive, such as dynamite, with radioactive material. The terms dirty bomb and RDD are often used interchangeably. Most RDDs would not release enough radiation to kill people or cause severe illness – the conventional explosive itself would be more harmful to people than the radioactive material. However, an RDD explosion could create fear and panic, contaminate property and require potentially costly cleanup.

A dirty bomb is not a nuclear bomb. A nuclear bomb creates an explosion that is millions of times more powerful than a dirty bomb. The cloud of radiation from a nuclear bomb could spread thousands of square miles, whereas a dirty bomb’s radiation could be dispersed within a few blocks or miles of the explosion. A dirty bomb is not a “weapon of mass destruction” but a “weapon of mass disruption,” where contamination and anxiety are the major objectives.

Impact of a Dirty Bomb

The extent of local contamination would depend on a number of factors, including the size of the explosive, the amount and type of radioactive material used, the means of dispersal, and weather conditions. Those closest to the RDD would be the most likely to be injured by the explosion. As radioactive material spreads, it becomes less concentrated and less harmful. Prompt detection of the type of radioactive material used will greatly assist local authorities in advising the community on protective measures, such as sheltering in place or quickly leaving the immediate area. Radiation can be readily detected with equipment already carried by many emergency responders. Subsequent decontamination of the affected area may involve considerable time and expense.

Immediate health effects from exposure to the low radiation levels expected from an RDD would likely be minimal. The effects of radiation exposure would be determined by:

- The amount of radiation absorbed by the body;
- The type of radiation (gamma, beta, or alpha);
- The distance from the source of radiation to an individual;
- The means of exposure – external or internal (absorbed by the skin, inhaled or ingested); and
- The length of time exposed.

The health effects of radiation tend to be directly proportional to radiation dose. In other words, the higher the radiation dose, the higher the risk and severity of injury.

Protective Actions

In general, protection from radiation is afforded by:

- Minimizing the time exposed to radioactive materials;
- Maximizing the distance from the source of radiation; and
- Shielding from external exposure and inhaling radioactive material.

Control of Radioactive Material

Radioactive materials are routinely used at hospitals, research facilities, industrial and construction sites. These radioactive materials are used for such purposes as diagnosing and treating illnesses, sterilizing equipment, and inspecting welding seams. The NRC together with its [Agreement States](#), which also regulate radioactive material, administer more than 22,000 licenses of such materials. The vast majority of these materials would not be useful in an RDD.

The NRC and its Agreement States have in place a multi-layered, comprehensive security program to protect these sources. This program has been effective, keeping incidents to a minimum and their consequences low. Most lost or stolen sources are quickly found, with little or no radiation exposure or contamination. The NRC continues to work at home and abroad to make risk-significant radiation sources even more secure. The United States was the first country to require enhanced security measures for radioactive sources, and the NRC continues to lead the world in source security. For more information, see our [Backgrounder on Protection and Security of Radiation Sources](#).

Other contact information

A number of federal agencies have responsibilities for dealing with RDDs. Their public affairs offices can answer questions on the subject or provide access to experts in and out of government. Their websites are:

- Department of Homeland Security: [DHS Radiological Attack Fact Sheet](#).
- Environmental Protection Agency: [EPA Radiological Emergency Response](#).
- Federal Emergency Management Agency: [FEMA Dirty Bomb Fact Sheet](#).

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