

## “Dirty Bomb” Fact Sheet

### **What is a dirty bomb?**

A dirty bomb, or "radiological dispersal device," is an ordinary bomb loaded with radioactive materials. It may range in size from a small device to a truck bomb, and perhaps larger. When the bomb goes off, or the truck crashes and explodes, the radioactive particles spread over a potentially broad area.

### **What is the damage caused by a dirty bomb?**

Almost all deaths and serious injuries would be confined to the immediate vicinity of the explosion. The surrounding area would shake from the blast. While those nearby would know a bomb had exploded, they would not immediately know it was a dirty bomb since radiation cannot be smelled, tasted, felt, or seen. However, local first responders have devices for detecting radiation and would be able to do so at the scene. Because the amount of radioactive material that can be loaded in a dirty bomb is relatively limited, casualties due to radiation poisoning are likely to be limited to the immediate vicinity of the explosion.

### **What would be the effects of this level of radiation exposure?**

People in the immediate area of the blast who survive could potentially die from radiation poisoning following the blast, and would be at an increased risk for cancer over the long-term. Most people outside of the blast area will not absorb enough radiation to cause radiation sickness, and even those who did would likely recover. Long-term health risks, such as cancer, may increase depending on the type of radioactive material used, the size of the explosive, wind conditions, and the effectiveness of the evacuation response.

### **What are the biggest dangers of a dirty bomb?**

Just as with a conventional bomb, there will likely be a number of deaths and injuries resulting from the explosion. However, very few people are likely to die from radiation.

### **If it is no more effective than a conventional bomb, why would it be used by a terrorist?**

Terrorists realize that our society has an inherent fear of radiation. They believe that using a dirty bomb, therefore, will cause tremendous psychological harm to our society and possibly result in widespread panic. There would certainly be casualties in the event of this type of attack. The economic damage would be significant because the access to the explosion area would be hazardous, and the cleanup costly. By educating ourselves about how to prepare for this type of attack, however, we can reduce the damage that would result from public panic.

### **How hard is it to make a dirty bomb?**

Assembling a crude device containing low-level radioactive material requires roughly the same skill as making a conventional bomb. However, the most lethal devices would be very difficult to make: as the amount of radioactive material needed rises, so does the risk that the builder of the bomb will develop radiation sickness or poisoning. Simply put, the more lethal the device, the higher the degree of expertise needed.

## **What should the public do in the event of a dirty bomb explosion?**

It is important to remember that those close enough to know a bomb has exploded would likely not immediately know it was a dirty bomb. If, however, you are near an explosion and realize radiation has been released, the first step to take is to get inside (or stay inside), and listen to the radio or television for further information. If you are inside, turn off fans, air conditioners, and forced-air heating units that bring in fresh air from the outside. Use them only to re-circulate the air already in the building. If you are outside, get into a building as soon as possible in order to reduce the amount of dust that gets on you. Radioactive dust can be washed off the skin and contaminated clothing should be abandoned to reduce external exposures.

If you are close to the explosion and able to identify the source of the radiation and wind direction, you should keep as much distance as possible between yourself and the source, and try to stay upwind from the source. In the case of dirty bombs, keep in mind that if you are far enough away to survive the initial explosion, the level of radiation you will be exposed to will most likely be so low that even a few hours of exposure will not be enough to harm you. Eating contaminated foods should be avoided.

## **How likely is an attack?**

While terrorists may have access to all of the ingredients needed to make a dirty bomb, the problem remains that assembling them can be lethal. Handling many types of nuclear materials can cause burns on the hands and body, and making a dirty bomb without some type of shielding from the radioactive material can cause death due to concentrated radiation levels. To make and transport an “effective” dirty bomb (that is, one that would cause high casualties and large amounts of radioactive material to be released) safely would require a lead container or shielding that makes it nearly impossible to move. These factors make it extremely difficult to make dirty bombs that are capable of spreading large amounts of lethal radiation.

However, it would be relatively easy to make an “ineffective” (that is, low casualties, little radiation released) dirty bomb. Low-level sources of radiation are much more widely available. Additionally, because they emit lower levels of radiation they are easier to store and handle. Although they are easier to make, a dirty bomb made with a low-level source would result in very few casualties from radiation poisoning.

Thus, an attack with a highly lethal dirty bomb is unlikely due to the various obstacles to creating it, while an attack with a relatively “weak” one is more likely, but would result in much less damage and disruption.

*More information on nuclear terrorism including additional fact sheets, backgrounders and reports is available on the CISAC website, <http://cisac.stanford.edu>.*