

# **Nuclear Terrorism**

by  
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## **Abstract**

There are essentially two different categories of nuclear terrorist devices – those based on release of nuclear explosive energy and those based on dispersal of radioactive material. They are quite different both to their effects and to the difficulties in obtaining, handling, and using them.

1. Before setting off a nuclear explosion, one has to acquire a nuclear bomb of some kind. In principle this could be achieved in one of two ways:

- A. Getting hold of an already existing weapon (from the inventory of a nuclear weapon state) one way or another.
- B. Getting hold of enough fissile material to be able to construct some primitive device containing supercritical mass.

Fortunately, both of these ways to obtain “nuclear bombs” present severe problems to the hypothetical perpetrators. Furthermore, in the case of an illegally obtained nuclear weapon from some nuclear weapon state elaborate actions have - as far as we know – been taken by nuclear weapon states to prevent any unauthorized party to explode it without access to the “keys” or codes necessary to unlock it.

It is commonly believed that supplies of fissile material are not as well guarded as the nuclear weapon themselves. Hence, it is not inconceivable that sufficient quantities of fissile material to enable the construction of a primitive nuclear device - in principle uranium or plutonium suitable for nuclear weapon construction - can be obtained from existing stocks of weapon usable material. (There is a common agreement among experts that it requires a reasonably technically and economically advanced state to produce these types of materials in adequate quantities and that this cannot be achieved clandestinely by non-state actors). The opinions among nuclear weapon experts differ, however, how easy – or difficult – it is to construct some simple device from weapon usable uranium or plutonium that would release a substantial amount of nuclear energy.

It goes without saying that a the explosion of a nuclear device would result in massive human deaths and injuries as well as a tremendous damage over large areas, even if the yield of the device would be considerably lower than the yield from a sophisticated nuclear weapon. Hiroshima and Nagasaki are two well known examples of what even fairly limited nuclear explosions could result in.

2. Leaving nuclear explosive devices aside, any type of radioactive material can in principle be used for dispersal purposes. The actual dispersal can be achieved in several fairly straightforward manners. Usually, one assumes that it is done by means of an ordinary explosion. The immediate damage caused to people by radioactive materia dispersed in this way is expected to be rather limited. One reason for this assumption is the fact, that material emitting gamma radiation has to be surrounded by

a heavy container – usually made of lead - to screen the activity. Furthermore, the amount of some highly radioactive material inside such a container has to be fairly limited in quantity. Otherwise, there is a risk that the perpetrators will be exposed to such high levels of radiation before exploding the device that they are unable to carry out the act of terrorism due to severe radiation sickness. In addition to being disabled, they are likely to die from such an exposure a few weeks to a few months after the onset of the sickness. Nevertheless, the costs of sealing off, shutting down and decontaminating a radioactively contaminated area can be very high – especially if the area is situated in a sensitive urban environment such as a major communication center or an airport.

### **Brief Biography**

Gunnar Arbman has a Ph.D. in Physics and is presently Director of Research at the Swedish Defence Research Institute. He has been active in the field of nuclear weapon issues for more than two decades.