

Sealed  
Radioactive Sources

Could that be  
a sealed radioactive source?



**IAEA**

International Atomic Energy Agency

Sealed radioactive sources are used widely in medicine, industry, and agriculture — by doctors to treat cancer, by radiographers to check welds in pipelines, or by specialists to irradiate food to prevent it from spoiling, for example. The radioactive substance within the source is sealed within a protective container. Radioactive substances emit energetic particles or waves.

Professionals who work routinely with radioactive sources are able to do so safely because of their skill and training and because they are knowledgeable about the safety features and design of the equipment they are using.

When these sources are lost or stolen, however, they can fall into the hands of persons who do not have such training



*Teletherapy equipment uses powerful radioactive sources to kill cancer tumours.*

and knowledge. In such circumstances, radioactive sources may be a serious risk to anyone who comes too close to them, touches them, or picks them up, particularly if they are damaged.

Serious injuries from sealed radioactive sources have occurred in the past when a radioactive source is found and the person handling the source is not aware of the risk.

In Thailand in February 2000, two scrap collectors obtained a radioactive source, and unaware of the risk, tried to take it apart. As a result, ten people were seriously injured, three of whom died. Many hundreds more living in the area of the scrap yard sought medical advice.

In June 2000, six members of a family in Egypt became seriously ill from a radioactive source that someone had found and taken home. The father and one child died as a result and 76 people in the neighbourhood were found to have some symptoms of radiation exposure.

The same radiation that can penetrate metal or kill tumours, can also be harmful, if it is not properly controlled. Excessive exposure to radiation can result in injuries such as skin burns. Being too close to a high activity source for too long can cause radiation sickness. Prolonged exposure to a high activity source can kill or increase the risk of cancer.

To inform people of the presence of radiation, radioactive sources have special labels. The trefoil is the international symbol that appears on all containers, materials, or devices that have a radioactive component. The word “radioactive” and the number I, II, or III may also appear on the packaging used to transport radiation sources.



*“Trefoil symbol”  
for radiation*



*Radiation transportation  
package label*

Radioactive sources come in a variety of shapes and sizes. They can be as small as the tip of a match or needle or as large as a paint can. High activity sources are inside a lead or other heavy material container, which acts as a protective shield. Heavy materials block radiation, making sealed radioactive source containers typically heavy.



1 — Type B transport package for radioactive material (IAEA).

2 — An old transport container for radioactive material recovered during an IAEA-assisted mission. (Georgia, 2002) (IAEA).

3 — A radium applicator once used for insertion into a patient's nasal passageways to shrink the lymphoid tissues. (Oak Ridge Associated Universities 1999).

4 — Industrial radiography source. This type was used in the USA during the 1930s and 1940s to inspect welds and metal casting. (Oak Ridge Associated Universities 1999).

- Anyone finding a package or metal container with a radioactive symbol should stay as far away from it as possible.
- Do not touch it or pick it up.
- Contact the appropriate authorities or the police.

Radiation injuries can look like a burn, but unlike thermal burns, they do not heal easily. High levels of radiation exposure may also result in symptoms of nausea, diarrhoea, and fever. Anyone with these symptoms, who has been near to or touched a package or metal container with a radioactive symbol should see a doctor immediately. Be sure to tell the doctor about any contact with a radioactive source. Remember you do not have to touch a radioactive source in order to be exposed to radiation.



*Blistering of the palm of the right hand caused by radiation (IAEA).*

Sources are sometimes lost on construction sites or when old equipment is thrown away. Lost or discarded sources can end up in scrap metal yards.

People who collect scrap metal need to know how to recognize a sealed radioactive source. Old equipment, particularly if it is unusually heavy for its size, should be checked for the radiation symbol.

*Discarded electrical generators may contain a powerful radioactive source.*





The best way to prevent an accident or injury is to prevent the radioactive source from being lost or stolen in the first place.

Users should make sure that a source is kept secure at all times and, when it no longer has a useful purpose, it is properly disposed of at a licensed radioactive waste facility.

*Sealed radioactive sources were found in an old military transport scrapyard at the Lilo Training centre in Georgia (IAEA).*



Cover photo: *Damaged teletherapy heads (IAEA).*

For more information about sealed radioactive sources or radiation in general, contact your local regulatory authority. Information is also available on the International Atomic Energy Agency's website <http://www.iaea.org>

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