

The International Atomic Energy Agency (IAEA) receives reports of serious injuries or deaths due to misuse or accidents involving sealed radioactive sources. Radioactive sources, used widely throughout the world in medicine, industry, and agriculture, if lost or improperly discarded, increase the likelihood of a serious accident. The IAEA offers a wide range of activities and services to assist its Member States to improve the safety and security of sealed radioactive sources.

Accident prevention requires a comprehensive approach to controlling sealed sources: applying standards for manufacturing and use; establishing regulatory control and inventories; training users on good practices; and disposing of the source when it no longer is used.

Over the past decade, the security of sealed sources has become a growing concern, particularly the potential that such a source could be used as a radioactive dispersal device or “dirty bomb”. Preventing the loss or theft of sealed radioactive sources reduces both the risk of accidents and the risk that such sources could become an instrument of misuse.

*During a recovery operation for radiation sources, Georgian emergency and rescue workers combed the terrain with hand-held radiation detectors (V. Mouchkin/IAEA).*



## KEY ACTIVITIES

### ◆ Internationally recognized safety standards

The IAEA develops safety standards on a wide range of topics related to radiation. These safety standards are developed through a consultative process with experts around the world to take into account the current state of knowledge in the area. Member States use these standards as the basis for national standards and regulations in such areas as: radiation protection, manufacture and design, transport, and waste disposal.

The International Basic Safety Standards for the Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115 (1996), is a comprehensive standard for radiation protection for all activities that involve radiation. Other standards dealing with sealed sources include:

- Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material (2002)
- Building Competence in Radiation Protection and the Safe Use of Radiation Sources: Safety Guide, Safety Standards Series No. RS-G-1.4 (2001)
- Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety, Safety Standards Series No. GS-R-1 (2000)
- Radiation Protection and the Safety of Radiation Sources: A Safety Fundamental, Safety Series No. 120 (1996)
- Regulations for the Safe Transport of Radioactive Material (1996)

### ◆ Advice through Safety Reports, technical documents and services

In addition to formal safety standards, the Agency also provides advice through safety reports, technical documents and services. Safety Reports and technical documents (TECDOCs) are produced on a wide range of topics, such as: management of disused sources, procedures for conditioning and storing long lived sealed sources, and borehole disposal. Prepared in consultation with leading experts, these documents provide detailed guidance at the technical level for those working in the relevant area.

The IAEA provides a wide range of services to assist Member States improve safety and security of radioactive sources. For example, regional training courses to help guide the development of national strategies for regaining control over sealed sources have been conducted in Asia, Africa, and South America. To reduce the risk of illicit trafficking of sources, the Agency has provided training in radiation monitoring for customs authorities and is working with international law enforcement agencies to enhance international co-operation in this area.

The Agency also facilitates information exchange through international conferences, symposia, and technical meetings.



Sources used in mobile caesium irradiators in the former Soviet Union containing 130 TBq (~3500 Curies) of caesium-137. (Soviet Union)/IAEA

### ◆ International Catalogue of Sealed Radioactive Sources

When a radioactive source or a device is found, one of the first practical problems is how to identify the type and strength of radiation it produces, so that it can be handled safely. With old sources, this is not always straightforward, as the labelling may be worn or the source container unfamiliar when compared to current models. To address this problem, the IAEA has developed a comprehensive, searchable database of sealed radioactive sources. The database includes pictures, illustrations, and technical specifications of sealed radioactive sources collected from manufacturers, distributors, regulatory bodies, waste management companies, professional associations and information available at IAEA. It will provide a valuable reference tool to facilitate the identification of unknown

sources. The catalogue contains information on over 6000 source models and over 5000 devices.

Contact International Catalogue:  
The Division of Nuclear Fuel Cycle  
and Waste Technology  
[http://www.iaea.org/  
OurWork/ST/NE/NEFW/  
wts\\_I8\\_01\\_SOURCE.html](http://www.iaea.org/OurWork/ST/NE/NEFW/wts_I8_01_SOURCE.html)

### ◆ Assistance in conditioning of disused sources

The IAEA helps countries condition disused sealed radioactive sources. Conditioning a source ensures that radiation from the source is safely contained and secured to reduce the risk of theft. When kept in a secure facility, conditioned sources can be stored safely. IAEA Member States can request direct assistance to condition

disused sources. To date over 50 conditioning operations have been conducted in some 45 Member States, involving over 10 000 individual sources. To facilitate this work, the Agency has developed specialized mobile equipment and is working with source manufacturers worldwide on the return of disused sources where feasible.

*Contact Conditioning Disused Sources: The Division of Nuclear Fuel Cycle and Waste Technology  
<http://www.iaea.org/OurWork/ST/NE/NEFW/index.html>*

achieve the five milestones required for a comprehensive infrastructure.

The five milestones are to establish:

- a regulatory framework;
- occupational exposure control;
- medical exposure control;
- public exposure control; and
- emergency preparedness and response capabilities.

*Contact Regulatory Infrastructure: Department of Nuclear Safety and Security  
<http://www-ns.iaea.org/projects/modelproject/default.htm>*

#### ◆ Emergency assistance during accidents or in recovery of a radioactive source

Under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Member States party to the Convention can ask for Agency assistance to deal with an emergency involving a radioactive source. This assistance may be in the form of technical advice or direct assistance in safely recovering and securing a source that has been found or treating persons exposed to radiation.

*Contact Emergency Assistance: Department of Nuclear Safety and Security  
<http://www-ns.iaea.org/tech-areas/emergency/default.htm>*

#### ◆ Improving regulatory infrastructure

The IAEA Model Project on upgrading radiation protection infrastructure involves 89 countries from Africa, West Asia, East Asia and the Pacific, Europe, and Latin America. Since its initiation in 1995, over \$45 million has been dispersed to support participating countries. To achieve the overall goal of upgrading radiation protection infrastructure to comply with the International Basic Safety Standards for the Protection against Ionizing Radiation and for the Safety of Radiation Sources, each participating country is developing action plans to



*Trainees are shown how to use a radiation counter during a training course for customs and police officials organized by the IAEA with the World Customs Organization and Interpol. (Austro-Hungarian border, Nickelsdorf, Austria, October 1999)/V. Mouchkin (IAEA)*

#### ◆ Illicit trafficking database

The IAEA's Illicit Trafficking Database was established in 1995 and today about 70 States provide information on incidents involving the unauthorized receipt, provision, use, transfer or disposal of nuclear and other radioactive material, including radioactive sources. Its primary function is to provide reliable and accurate information in a timely manner on all trafficking incidents to Member States, media, and the public. Analysis of the data and trends is useful for developing programmes to combat trafficking of nuclear and radioactive materials.

*Contact Illicit Trafficking:  
The Office of Physical Protection  
and Material Security  
<http://www-ns.iaea.org/security>*



The IAEA is working to  
improve the safety and security  
of sealed radioactive sources.



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