The Agency is implementing a comprehensive programme aimed at stemming the threat of nuclear terrorism.

Promoting Nuclear Security: What the IAEA is doing

“The horrifying events of September 11, 2001 demonstrated all too well the urgent need to strengthen worldwide control over nuclear and other radioactive material.”

IAEA Director General, Mohamed ElBaradei

The Threat of Nuclear Terrorism

The threat to public safety and security posed by some form of nuclear terrorism is not new. But in the wake of recent highly organized terrorist attacks in Kenya, Tanzania, the United States, Indonesia, Saudi Arabia, Morocco and numerous other nations, the international community has come to recognize that new and stronger measures must be taken to protect against and prepare for a diverse range of terrorist scenarios.

Terrorists might attempt to steal a nuclear weapon, or they could attempt to acquire the nuclear material necessary for constructing a nuclear device. They might also try to acquire radioactive materials with the goal of making a Radiological Dispersal Device (RDD), or so-called “dirty bomb.” They could also initiate acts of sabotage against nuclear power stations, research reactors, storage facilities, or transport operations with the goal of spreading radioactive contamination.

Such possibilities appear more probable in the context that today’s suicide terrorists hold few personal fears concerning their own safety — there are no self-imposed limits on consequences. Moreover, since the September 11, 2001 suicide attacks on the Pentagon and World Trade Center, nuclear terrorism has gained recognition as a potential threat.

Combating Nuclear Terrorism

Given the multiplicity of targets and scenarios for terrorists, States must consider a comprehensive approach to combating nuclear terrorism. Among the key priorities:

— Adequate physical protection of all nuclear materials, radioactive materials and facilities plus transport systems;

— Proper regulatory control of nuclear and radioactive material;

— Effective detection and interdiction of illicit trafficking in nuclear and radioactive materials;

— Integration of nuclear safety and security systems for maximum benefits; and

— Readiness for implementing emergency response plans.

An IAEA expert demonstrates the use of a radiation detection “pager” to border guards in Uzbekistan / M. Riihonen, IAEA.
The IAEA is assisting its Member States with these challenges in many ways. Through well-established activities, the Agency has been heavily involved in providing assistance and technical support to States in all these areas. Moreover, a recently launched “Nuclear Security Plan of Activities” (March 2002) is reinforcing and strengthening these activities in a comprehensive and co-ordinated international approach.

Nuclear security is based on international agreements and guidance — the conventions, standards, guidelines, and recommendations that help national authorities control nuclear materials and nuclear-related activities. Indeed, a comprehensive system of regulations governing nuclear activities and radioactive materials is in the front line against terrorist threats. The IAEA assists all its Member States to implement these agreements — they serve as an integral part of the international regime for preventing nuclear terrorism.

Deficiencies remain in the legal, administrative, and technical arrangements for controlling and protecting nuclear materials and radioactive sources in many countries. Recent incidents have resulted in intensified efforts to address these problems and ensure the consistent application of international standards on radiation safety and security promoted by the IAEA and partner organizations.

The complex of measures for safety, security and control (including transborder movements) and the requirements for an adequate legal framework are being addressed through IAEA assistance, including training projects.

IAEA activities under its Safeguards programme also serve to reinforce Member States’ efforts to combat nuclear terrorism. IAEA INFCIRC/153 Agreements require States to have an effective State System of Accountancy and Control (SSAC) for nuclear material, and the IAEA provides assistance in ensuring the technical effectiveness of these systems. Such nuclear material accountancy and its verification by the IAEA contribute substantially to the deterrence and detection of any theft of nuclear material. Helping States to establish effective SSACs is an integral part of the Agency’s worldwide nuclear security strategy.

Safety and security specialists need to work together closely in the identification and protection of vital areas of nuclear facilities — the structures, systems and components that, when properly protected, can ensure the safety of the plant as defined by the regulatory authority. When protecting vital areas, physical protection measures and engineering safety measures work in parallel to minimize the possibility of an uncontrolled radioactive release. Their location is selected to optimize physical protection and operational safety. The IAEA is making significant efforts to bring together safety and security specialists from around the world to develop guidance in addressing the key issues related to the sabotage of nuclear facilities.

The IAEA has established several advisory services to help Member States to assess the effectiveness and the need for improvement of their national physical oversight systems. The IAEA provides peer reviews in related areas such as regulatory or control infrastructures, and also supplies expert technical advice on the required upgrades. Several of these specialized services aim directly at protecting against terrorist threats.

Since 1995, the International Physical Protection Advisory Service (IPPAS) has been helping Member States to strengthen and enhance the effectiveness of their physical protection of nuclear materials and facilities. At the request of a Member State, IPPAS assembles a team of international experts in physical protection to assess the State’s system, compare it with international standards and make recommendations for improvements.

IPPAS team recommendations cover legislation and government organization, licensing and regulations, facility implementation and assessment, and inspection and enforcement. IPPAS missions have already been carried out in Eastern and Central Europe, Latin America, Africa and Southeast Asia.

The International Nuclear Security Advisory Service (INSServ) is a new initiative that is providing specialized services promoting enhanced nuclear security. The service has been developed to review both overall and specific needs of States to strengthen their capacity to prevent, detect and respond to nuclear terrorism. INSServ missions are not intended to provide detailed technical fixes to deficiencies. Rather, they are aimed at identifying the nuclear security needs. By the end of 2003, some six expert INSServ missions will have been conducted in several regions.

Some of these missions consider the adequacy of measures taken by States to control and secure radioactive sources and have already paid sizeable dividends. In one instance, a research reactor with Highly Enriched Uranium (HEU) and...
two irradiators containing a sizeable quantity of Cobalt-60, were observed to have essentially no physical protection. Action was taken shortly after to improve this situation. Due to the thoroughness of these missions, additional situations will be identified which will require immediate follow-up. With the experience of these initial missions, the Agency is in a position to move more rapidly in arranging these INSServ assessments and implementing their recommendations.

The International SSAC Advisory Service (ISSAS) is another new initiative providing advice to Member States in strengthening their SSAC. ISSAS support is available to all countries with nuclear materials and facilities. ISSAS missions compare the procedures and practices in Member States with the obligations specified under safeguards agreements, with international consensus guidelines and against equivalent practices in other countries.

New recommendations concerning the Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.4) were issued in 1999. One major innovation in these recommendations is the importance attributed to the creation and operation of a “design basis threat” (DBT) in implementing national physical protection programmes. The DBT Process helps States to define the characteristics of potential adversaries who might attempt the unauthorized removal of nuclear materials or sabotage in order to determine the physical protection measures required. The IAEA recommends development of a DBT for each of its Member States to strengthen the effectiveness of their physical protection systems, and offers workshops to help them define and implement a DBT and the measures needed to protect the State’s nuclear facilities.

The IAEA also offers the EPREV (Emergency Preparedness REVIEW) service for Member States. Under this programme, international teams of experts conduct reviews of preparedness for nuclear or radiological emergencies in Member States on request of the host country. The EPREV programme provides an opportunity for emergency response planners in all countries to assist other planners through the dissemination of information on best international practice.

Each EPREV mission is conducted by a team of experts with extensive experience in response and preparedness for nuclear and/or radiological emergencies.

### Uncovering Nuclear Smuggling at Border Crossings

Laboratories and companies around the world are working steadily to improve the technology for detecting radioactive materials, using a variety of nuclear forensic techniques to characterize the nature and origins of confiscated material quickly. The IAEA has been working with the Austrian government for many years on equipment enhancement and field-testing at border crossings.

But each country must take numerous issues into consideration when designing and implementing border monitoring systems. The IAEA recently initiated a Co-ordinated Research Project (CRP) on "Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and other Radioactive Material" to enhance ongoing efforts to combat nuclear smuggling. The project involves 28 laboratories in 18 countries.

Researchers are improving the capability of instruments (portable radionuclide measurement devices and stationary systems) that are crucial to detecting and identifying radioactive materials in containers and vehicles or carried by individuals at borders. The latest knowledge and technologies are then being shared through the IAEA co-ordinated network. For the possible seizure of radioactive material by law enforcement officials, the IAEA is establishing a system for the provision of nuclear forensics support to Member States for the characterization of this material.

The IAEA Nuclear Security Equipment Laboratory was established in 2003. In addition to the equipment development related to the CRP, the laboratory provides support for equipment monitoring, maintenance, procurement and emergency response, for numerous nuclear security related projects of the IAEA. The combination of development effort and implementation support in one location is accelerating technical progress in the deployment of improved equipment in the field.
Securing Research Reactors

There are hundreds of research reactors in countries throughout the world. Many of these reactors are old, obsolete, inoperative, or in need of repair. In some cases, stocks of spent fuel are stored in an insecure manner. In other instances, spent fuel has been building up for years with few opportunities for disposal. Some of these reactors are still fueled with high enriched uranium (HEU), a key ingredient for assembling a nuclear weapon.

Since 1999, the IAEA has been helping to enhance the general safety of ageing research reactor facilities, and spent fuel storage, in selected countries of the former Soviet Union, and Eastern and Central Europe. The goal is both to reduce the risk of accidents and to improve the safety and security of such facilities.

Because of the proliferation risks associated with the HEU fuel at some research reactors, the Nuclear Threat Initiative has approved a contribution of US $260 000 to the IAEA to support development of an integrated plan for the return shipment of HEU at over 30 Soviet-supplied research reactors.

IAEA Nuclear Security Plan of Activities

Immediately after “9/11”, the IAEA 2001 General Conference requested a review of the Agency’s activities relevant to preventing nuclear terrorism. The following March, a plan for enhanced activities was delivered to the Board of Governors. Upon approval, the new initiative became known as the IAEA Nuclear Security Plan of Activities.

This Plan builds on, accelerates and expands a number of existing IAEA activities under a single co-ordinator. It also introduces several new initiatives. The Activities Plan focuses on eight key activity areas:

1. Improving the physical protection of nuclear material and facilities
2. Detecting malicious activities involving nuclear and other radioactive materials
3. Strengthening State Systems of Accountancy and Control (SSACs)
4. Strengthening the security of radioactive materials other than nuclear material
5. Assessing the security/safety vulnerabilities of nuclear facilities
6. Responding to malicious acts and threats
7. Ensuring compliance with international agreements and guidelines
8. Co-ordinating information on nuclear security.

The Plan is built around a comprehensive approach that includes both prevention and detection of nuclear terrorism and appropriate response should it happen. The IAEA is also working to articulate emergency measures.

In the prevention realm, the Plan supports several key activities: nuclear security evaluation and appraisal missions; implementing security upgrades, including through bilateral support; expert missions aimed at securing “orphaned” radioactive sources, notably in the States of the former Soviet Union; and developing of national strategies for locating and securing sources.

In the area of detection, the Activities Plan aims to further strengthen capabilities of the authorities controlling border crossings; to validate instruments used for detection; and to supply detection instruments to Member States through Agency programmes and bilateral support.

To respond to any terrorist attack, the Activities Plan is helping the Agency and States to prepare emergency response arrangements, through improved planning and methodology development. This also includes assisting in the transportation of samples, and making nuclear forensics analysis available to numerous States.

To enhance co-ordination with other UN agencies and bodies, the IAEA participates in the Security Council Counter-Terrorism Committee established by the Secretary General in October 2001. It also works closely with a number of international organizations, including the World Customs Organization on security and trade issues, the Universal Postal Union on mail security issues, and Interpol and Europol in combating illicit nuclear trafficking.

The resources required to implement the plan of action to protect against nuclear terrorism are about US $12 million per year over a period of three years. Financial pledges for implementing the Plan from 20 States and one organization to date exceed $22 million.

For further information and reading, please see:

“Experts at International Conference Look to Reinforce Security of Radioactive Sources Against Potential Terrorist Threats”
http://www.iaea.org/worldatom/Press/Focus/RadSources/index.shtml

“Reducing the Threat of RDDs”, IAEA Bulletin, Journal of the IAEA, Volume 45, Number 1
http://www.iaea.org/worldatom/Periodicals/Bulletin/Bull451