

The Threat of Nuclear Terrorism: Assessment and Preventive Action

*Anita Nilsson**

The International Atomic Energy Agency (IAEA) is an international organization with a global mandate in the atomic energy area. It has a wide assortment of programmes, underpinned by three pillars.

The first pillar, most relevant for security, contains the Agency's responsibilities under the provisions of the Nuclear Non-Proliferation Treaty. When becoming parties to this treaty, non-nuclear weapon States undertake to put all their nuclear material under international control, so called "safeguards". The IAEA verifies that States *honor their undertakings*, use the nuclear materials they possess for peaceful activities only and do not divert them to military use or to any activities related to weapons production. The second pillar relates to the establishment of standards for the safe conduct of nuclear activities. The third pillar involves the development and transfer of technology for peaceful purposes so that as many as possible can reap the benefits of the peaceful application of such technologies.

The term "nuclear sector" includes a wide range of activities (see box 1), from nuclear power plants to the use of radiation in beneficial applications, such as diagnostics, cancer treatment and industrial applications. In addition, nuclear fuel cycle facilities prepare fuel, manage spent fuel and take care of waste material. The transport of nuclear and other radioactive materials and waste is another key nuclear activity.

Box 1

The Nuclear Sector

Global Overview

- 438 power reactors
- 504 fuel cycle facilities (250 in operation)
 - 89 uranium mills and conversion plants
 - 22 enrichment plants
 - 59 fuel fabrication plants
 - 67 interim storages
 - 13 reprocessing plants
 - 277 operational research reactors
- Widespread use of radiation sources

* Anita Nilsson is Head of the Office of Physical Protection and Material Security of the International Atomic Energy Agency.

Nuclear material is a basic requirement for any of the peaceful nuclear applications mentioned above. It is, however, also the main ingredient of a nuclear weapon. Globally, very large quantities of nuclear materials are recorded (see box 2). In addition to nuclear material in nuclear power plants, research reactors and fuel cycle facilities, more nuclear material comes out of the disarmament process. This means that materials that had a military application are now withdrawn from its military use and transferred to peaceful applications. Much of this material is coming from the dismantling of nuclear weapons.

Box 2

Nuclear And Other Radioactive Materials

- Nuclear material under safeguards:
111,000 “significant quantities” as defined in IAEA INFCIRC/153
- Nuclear material outside of safeguards:
 - Highly enriched uranium and plutonium:
 - In the order of 1 000 tonnes
- Nuclear material in military use
- Large number of radioactive sources (many of them not under regular control; “orphaned”)

WHAT IS THE THREAT FROM THE NUCLEAR SECTOR?

Nuclear materials may be susceptible to threat unless they are properly controlled and protected by Member States. Material can be stolen by terrorists or other criminals, or diverted to a non-peaceful application by a State. If nuclear material gets into the wrong hands, it can be used for nuclear weapons purposes or dispersed as a radiological weapon (a so-called “dirty” bomb whereby radioactive material is dispersed by means of conventional explosives). Further, the nuclear industry operates nuclear facilities such as research reactors and power plants, which could be a target for sabotage and consequently cause a release of radioactive material. There is also a threat that sabotage involving poorly protected radiation sources could cause a radioactive dispersion.

WHAT EVIDENCE IS THERE OF SUCH A THREAT?

In the beginning of the 1990s, reports of cases of illicit trafficking of nuclear and other radioactive materials started to appear from various countries (see box 3). The Agency was requested in 1994 by its General Conference to establish a database on illicit nuclear trafficking to monitor the evolution of this new situation. Since 1993 States parties have confirmed almost 400 cases of illicit trafficking or inadvertent movement. Of the many cases, some have been serious, but most have been trivial. Over time, the frequency of cases has gone down and there has been a change in the type of substances being detected. Instead of nuclear material, other radioactive materials are appearing in increased numbers.

The information available on attempts or threats of sabotage of nuclear facilities is more limited. Since the impact of sabotage on a nuclear facility may be serious, the

nuclear industry and responsible governments implement in-depth measures to prevent sabotage activities from being realized. Recent events demonstrate that there is no room for complacency in this respect.

Box 3

Illicit Trafficking & Inadvertent Movement

Illicit trafficking database programme

- Maintained since 1993
- 70 States assigned a point of contact (POC)
 - Almost 600 incidents, 400 confirmed by States
 - ≈ 50% involving nuclear material
 - 19 cases with highly enriched uranium or plutonium
 - ≈ 50% involving other radioactive material, 12 sources > 1TB
- 75% of cases within a criminal context

WHAT CAN BE DONE TO IMPROVE SECURITY?

First, it should be underlined that the responsibility for nuclear material being used only for peaceful purposes and that the material and facilities are adequately protected lies exclusively with States' governments. The IAEA, as an international organization, can help governments to promote certain activities that would increase nuclear security. The Agency does this through a number of programmes (see box 4).

Box 4

IAEA Contributions to Security

- Verification of States' obligations in Safeguards agreements
- Programme for physical security
- Programme on illicit trafficking
- Programme for nuclear installation safety
- Programme for safety and security of radioactive sources
- Emergency response programme

The use of nuclear material is subject to the Nuclear Non-Proliferation Treaty, and the Convention on the Physical Protection of Nuclear Material. Supplementary IAEA documents provide further guidance on the establishment of the necessary control and protection systems. Coincidentally, on the 11 September 2001, the IAEA Board of Governors endorsed a new set of security fundamentals applicable for the physical protection of nuclear material. These fundamentals underline, *inter alia*, that a security culture should be implemented for all kinds of nuclear activities. Although not legally binding, the recommendations published by the IAEA for the physical protection of

nuclear material and nuclear facilities (INFCIRC/225/Rev. 4) have obtained widespread international acceptance (see box 5).

Box 5

The Physical Protection Regime

- Convention on the Physical Protection of Nuclear Material
States Parties to draft a strengthening amendment of the CPPNM
- Security fundamentals
Newly endorsed by IAEA Board and General Conference
- INFCIRC/225/Rev 4 – *Internationally accepted recommendations*

The Basic Safety Standards includes a requirement for radioactive sources “to be kept secure so as to prevent theft or damage”. Many countries have incorporated this requirement in their national regulations. Other than this, it should be noted that the security of radioactive sources is not covered by a legal obligation (see box 6). A “code of conduct” helps States to take the necessary actions to secure that radioactive sources are kept safe and secure.

Box 6

Security of Radioactive Sources

- Basic Safety Standards
- Revised Action Plan for the Safety and Security of radiation sources.
- Code of Conduct on the Safety & Security of Radioactive Sources.
- Efforts to locate and bring into safety “orphan sources”
- Services to assess States’ regulatory systems for control of radioactive sources
- Management of disused sources
- Safety Guide on the Safety & Security of Radiation Sources (Draft)

The Agency can help States calibrate their physical protection systems, if they so request. The needs for improvements as well as good practices are identified. An incentive for States to request this assistance is to make use of the assessment to demonstrate that it adheres to international standards.

Comprehensive security measures also require arrangements for “interdiction”, namely, if the prevention of a theft fails, there are systems in place at borders to detect

smuggled nuclear material or radioactive sources. This requires awareness and competence in the law enforcement organizations.

The Agency has been offering a wide variety of training in the nuclear security area. In the course of the past ten years, but mainly in the last five years, the Agency has trained more than 1,500 people from nuclear authorities, nuclear facilities and law enforcement authorities, in such programmes.

IAEA DATABASE ON ILLICIT TRAFFICKING

The Agency maintains a database on illicit trafficking and inadvertent movement in order to get a more solid picture of the reality of the situation and share the information with its Member States. This information system will be strengthened to cover in addition to illicit trafficking, other relevant aspects of security. This requires active interaction with Member States points of contacts, and an effective system in place to handle large volumes of information (see box 7).

Box 7

Strengthening IAEA Programmes to Prevent Nuclear Terrorism

- Review all programmes thoroughly with a view to strengthening the activities to prevent nuclear terrorism
- Review the implications of the enhanced threat
- Promote a comprehensive approach to security
- Strengthen the legal instruments for physical protection and extend the scope of States' undertakings
- Promote high security culture in States
- Promote security in all nuclear applications
- Enhance direct assistance to States for improved security

CONCLUSION

In the light of the events of 11 September, the General Conference requested the IAEA Director General to review thoroughly the activities and programmes of the Agency with a view to strengthening the Agency's work relevant to preventing acts of terrorism involving nuclear materials and other radioactive materials. That review is ongoing and the results will be presented in March to the Board of Governors, including proposals for revisions and updates on relevant programmes.

I would like to underline that preventing nuclear terrorism requires cooperation between States and with international organizations. The problem must be addressed in a comprehensive manner. The events of 11 September demonstrated that the level of security is only as strong as its weakest link. We must therefore strive for strong, comprehensive, internationally accepted security systems. I am convinced in joint efforts that we can make a more secure world.