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# Nuclear Security Report 2007

## Measures to Protect Against Nuclear Terrorism

*Report by the Director General*

## **Summary**

- In March 2002 the Board of Governors approved in principle the proposals contained in the report entitled *Protection against Nuclear Terrorism: Specific Proposals*<sup>1</sup>. Since then, the Agency has accorded, as requested by the Board, the highest priority to the effective implementation of its programme of enhanced activities in the area of nuclear security. In September 2005, the Board of Governors approved the Director General's proposal for a new Nuclear Security Plan (NSP) covering the period 2006–2009, and expressed the view that the Secretariat should issue a report annually on nuclear security. The first such annual report by the Director General was welcomed by the Board in August 2006<sup>2</sup>. At its fiftieth regular session (2006), the General Conference requested the Agency to prepare an annual report highlighting significant accomplishments of the prior year and establishing goals and priorities for the year to come for the fifty-first regular session (2007) of the General Conference<sup>3</sup>. This report has been produced in response to the request contained in resolution GC(50)/RES/11 and covers the period 1 July 2006–31 June 2007.

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<sup>1</sup> See GOV/2002/10.

<sup>2</sup> See GOV/2006/46-GC(50)/13.

<sup>3</sup> See GC(50)/RES/11.

## **Recommended Action**

- It is recommended that the Board of Governors:
  - a. Take note of the Nuclear Security Report 2007, on Measures to Protect Against Nuclear Terrorism;
  - b. Transmit this Report to the General Conference with a recommendation that States contribute on a voluntary basis to the NSF, which is necessary for the continuation of the Agency's activities related to the measures to protect against nuclear terrorism;
  - c. Call upon States to ratify as soon as possible the Amendment to the Convention on the Physical Protection of Nuclear Material and to promote its early entry into force; implement the legally binding and non-binding international nuclear security related instruments; and invite States to make full use of the assistance available for this purpose through participation in the Agency's nuclear security programme; and
  - d. Invite all States to participate in the Illicit Trafficking Database programme on a voluntary basis.

# Nuclear Security Report 2007

## Measures to Protect Against Nuclear Terrorism

*Report by the Director General*

### Executive Summary

1. The threat of nuclear terrorism has not diminished over the past year. In response to the threat, an international nuclear security framework has emerged through the development and approval of a series of legally binding and non-binding international instruments. Progress on ratifying or adhering to these instruments, particularly to the Amendment to the Convention on the Physical Protection of Nuclear Material, remains slow. States need to give a new impetus to this process, building on the progress achieved by bringing into force the International Convention for the Suppression of Acts of Nuclear Terrorism, this year.

2. The Agency continues to assist States' efforts to enhance nuclear security and to implement the aforementioned nuclear security framework described in Section B. Agency efforts are aimed at ensuring the sustainability of nuclear security improvements and dealing with the legacy of limited security, which stems, inter alia, from the past assumption that nuclear and other radioactive material were self protecting. It does so through a range of capacity building activities including missions, human resource development and upgrades to the physical protection of nuclear and other radioactive material and related facilities. In the period covered by this report (1 July 2006–30 June 2007), the Agency:

- achieved increased participation in the Illicit Trafficking Database Programme;
- provided training to more than 1650 people from 90 States;
- assisted in improving the physical protection at facilities in nine States;
- supplied over 900 pieces of security related equipment, including border detection equipment to 29 States; and
- completed 38 Integrated Nuclear Security Support Plans and is implementing, or is planning to implement, the agreed activities in all of the States concerned.

3. In carrying out its activities, the Agency has adopted a cross cutting approach to nuclear security, building on the synergies with other Agency programmes.

4. The Agency's efforts are part of a wider spectrum of action to protect against nuclear terrorism. The United Nations has responded to the increased threat of terrorism by initiating the development of an integrated approach to providing counter terrorism assistance. The international community, in recognizing the threat, has launched various initiatives to counter terrorism. Agency activities under

the Nuclear Security Plan (NSP) also contribute to achieving the nuclear security related objectives of these initiatives.

5. In response to increasing pressure on resources, the Agency is devoting greater effort to the coordination of its activities with those of others to ensure an effective and efficient use of resources. A methodology to prioritise further NSP activities and to improve programme management has been developed. In addition, the Agency has embarked on a more systematic approach to programme evaluation, the results of which will ensure in particular that the nuclear security training programme is better tailored to recipients' needs.

6. The Secretariat assesses that provision of assistance through the Nuclear Security Plans has improved overall global nuclear security. However, there is no room for complacency. Nuclear terrorism remains a real threat and greater efforts must be made to address that threat which could have devastating consequences.

## **A. Introduction**

### **A.1. IAEA Nuclear Security Programme**

7. The Agency embarked on its first comprehensive programme to combat the risk of nuclear terrorism by assisting States in strengthening their nuclear security through the adoption by the Board of Governors in March 2002 of the Director General's report on *Protection against Nuclear Terrorism: Specific Proposals*<sup>4</sup>. In September 2005, the Board of Governors considered and approved a second NSP covering the period 2006–2009<sup>5</sup>. The new NSP built upon the accomplishments of the first plan, reviewed the threat picture as it had evolved since the configuration of the priorities and approach set in 2002, and promoted the adherence to and implementation of strengthened international instruments to combat nuclear terrorism. The NSP gives priority to assisting States to meet their undertakings under the relevant legally binding and non-binding international instruments that constitute the new international nuclear security framework through the development of guidance and documents; provision of advisory services; review and assessment of needs and solutions; provision of support to States, as requested, for the implementation of nuclear security recommendations; and outreach and information exchange through databases, conferences, workshops and fellowships. Activities originally conceived for nuclear and radiation safety and verification objectives, but which also support nuclear security objectives, are also covered in the Plan. This report covers activities carried out under the NSP during the period 1 July 2006–30 June 2007.

### **A.2. Global context**

8. In the five years since the establishment of the Agency's first Plan to protect against nuclear terrorism, steady progress has been made in improving the security of nuclear and other radioactive substances. There is long-standing recognition that highly enriched uranium or plutonium requires effective protection against theft. In addition, there is a growing recognition that radioactive material can no longer be perceived as self-protecting. The international community has responded to this assessment and has addressed prevailing weaknesses in nuclear security, both by establishing a new

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<sup>4</sup> See GOV/2002/10.

<sup>5</sup> Included in GOV/2005/50.

platform of legally binding and non-binding international instruments and by recognising the urgent need to secure nuclear and other radioactive material. However, much remains to be done, both to deal with the legacy of insufficiently secured material and facilities and to ensure the universality, implementation and sustainability of the new international nuclear security framework.

9. There is an international consensus that nuclear terrorism remains a major threat. The fissile and radioactive materials that are the basis for peaceful nuclear applications also have the potential to be used in malicious acts. The effects of such action would be destructive and/or disruptive, in both the short- and long-term. Potential malicious acts range from the use, or threat of use, of a nuclear explosive device, stolen or constructed using illicitly acquired nuclear material; to dispersal of radioactive material to cause harm and disruption to people, property and the environment.

10. The greatest threat remains the potential terrorist use of an improvised nuclear explosive device, not because it is the most likely event, but because the immediate destructive consequences for life and property as well as the economic, psychological and political consequences would be enormous. Sabotage of nuclear facilities and transports, including buildings or locations with high-activity radioactive sources, is a threat and one that has some precedent in past events. As the number of nuclear and other facilities containing radioactive material continues to rise, and the quantities of material that may be in international transport increases, so will the need for effective security measures to prevent malicious acts. Designing and operating future facilities with this threat in mind should be an essential criterion. A new dimension in the threat has emerged from the recent malicious use of the radiotoxic properties of a substance. The related potential consequences are being more thoroughly evaluated.

11. The threat from radiological dispersal devices (RDD, dirty bombs) or radiological exposure devices has been brought into focus by reports that terrorist groups may be interested in such devices. Recent studies have shown that estimated costs of dealing with the disruption and clean-up resulting from the detonation of an RDD are much higher than previously estimated. Developing insights into the threat calculus would lead to the evolution of more effective preventive and response measures.

12. The international community has made progress in addressing security concerns over recent years. However, technical and administrative arrangements taken must be rigorously implemented to protect material and facilities against potential or actual malicious use.

## **B. International Nuclear Security Framework**

13. Over the course of recent years, the international community has agreed on several legally binding and non-binding international instruments<sup>6</sup> that are relevant for effective nuclear security. Promoting adherence to and implementation of these instruments is at the core of the Plan and establishes a platform for working towards effective nuclear security. The Agency, in addition, facilitates the development of relevant documents that establish fundamentals, recommendations, principles and guidance to assist States in implementing these instruments.

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<sup>6</sup> More information can be found on [www.iaea.org](http://www.iaea.org)

## **B.1. Legally binding and non-binding international instruments**

14. The instruments include:

### ***Binding Instruments***

- The Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment;
- The International Convention for the Suppression of Acts of Nuclear Terrorism;
- Safeguards Agreements and Additional Protocols;
- United Nations Security Council resolutions 1540 (2004) and 1673 (2006); and
- United Nations Security Council resolution 1373 (2001).

### ***Non-Binding Instrument***

- The Code of Conduct on the Safety and Security of Radioactive Sources and Supplementary Guidance on the Import and Export of Radioactive Sources.

15. On 7 July 2007, the International Convention for the Suppression of Acts of Nuclear Terrorism entered into force, but progress remains slow in international acceptance of these international instruments. In particular, States need to bring about the early entry into force of the Amendment to the CPPNM.

## **B.2. IAEA Nuclear Security Series**

16. The Agency is developing and publishing a Nuclear Security Series of documents, to *inter alia* assist States to implement the nuclear security framework; to adhere to legal instruments; and to make political commitments to the Code. While there has been an urgent need to develop documents with tangible guidance on how to deal with “new” security issues, current priority is being given to the development of documents that establish fundamental nuclear security principles and recommendations for their implementation. These “Fundamentals” and “Recommendations” will underpin more detailed implementing guidance on specific topics. To date, four documents in the Series have been published and eight are in the final stages of publication<sup>7</sup>.

17. The guidance provided through the Nuclear Security Series is being developed in close cooperation with Member States and in full synergy with the development of the IAEA Safety Standards Series. Cross references are being carried out to ensure that the guidance being provided is both comprehensive and compatible.

## **C. Tools and approaches to build sustainable nuclear security**

18. The overarching objective of the Agency’s NSP is to achieve improved worldwide security of nuclear and other radioactive material in use, storage and transport, and of associated facilities, by supporting States in their efforts to establish, maintain and sustain effective national nuclear security

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<sup>7</sup> A list of all Nuclear Security Series documents, published or in preparation, is available on [www.iaea.org](http://www.iaea.org)

regimes, inter alia, through the implementation of relevant international instruments. The Agency has given high priority to capacity building in States in fulfilment of that objective. This includes a balanced mix of human resource development, improving technical capabilities and supporting an effective legal and regulatory infrastructure, in each of the programme areas of prevention; and detection and response.

19. The nuclear security guidance referred to in paragraphs 15 and 16 is a major tool to promote, help establish and sustain security of nuclear and other radioactive materials in use, storage and transport. The process of development of the guidance ensures that it enjoys international consensus.

### **C.1. Assessment and Advisory Services**

20. To help States assess the status of technical as well as administrative arrangements, the Agency continues to offer nuclear security assessment, advisory and evaluation services, referred to as missions and technical visits. In the period covered by this report, the Agency carried out a total of 17 missions<sup>8</sup> with a further 13 missions in preparatory stages, and a higher number of technical visits, as part of other activities including the establishment of a border monitoring capability. The missions produce recommendations for improvements. The Agency then works with the State concerned, if requested, to establish a plan to address those needs (Integrated Nuclear Security Support Plan). The Agency is currently carrying out an evaluation of the results of past missions to assess their impact<sup>9</sup>.

21. In 2006, the Agency introduced a modular evaluation service, the Integrated Regulatory Review Service (IRRS), to help States improve the effectiveness of national regulatory bodies and to implement national safety legislation and regulations. This type of mission may also contain a review of the relevant part of the State's legislation and regulations governing nuclear security that would widen the scope of the mission beyond assessing the role of the nuclear regulatory authority and include the participation of other authorities involved in the area of nuclear security, for example, law enforcement authorities.

### **C.2. Nuclear security education and training**

22. Capacity building in States for sustainable nuclear security systems remained a high priority for the Agency over the past year. Target audiences for the Agency's nuclear security training outreach included policy makers, facility operators, nuclear regulators, lawyers, border forces, customs and police officers, legislators and emergency responders. These events also provide cooperation and coordination opportunities for participants from different national organizations.

23. Since 2003, the Agency has supported the development of nuclear security education at Sevastopol National University of Nuclear Energy and Technology in Ukraine, including three Nuclear Security Laboratories, modelled after a similar programme at the Moscow Engineering Physics Institute. Seven students taking the programme have already graduated from the programme at the University in Sevastopol. The modules for higher level education in Sevastopol will be made available and adapted for use in other universities.

24. In a joint project with the Russian Federation, the Interdepartmental Special Training Centre in Obninsk has been upgraded to allow practical, hands-on physical protection equipment training for

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<sup>8</sup> Missions include International Nuclear Security Advisory Service (INSServ); International Physical Protection Advisory Service (IPPAS); International Team of Experts (ITE); IAEA SSAC Advisory Service (ISSAS); Radiation Safety and Security of Radioactive Sources Infrastructure Appraisal (RaSSIA); and NSF funded Radiation Safety Infrastructure Appraisal (RaSIA). More information is available on [www.iaea.org](http://www.iaea.org)

<sup>9</sup> See section F.4.1.

facility operators and regulators or inspectors. Also in 2006, a newly equipped International Training Auditorium was inaugurated to receive more international students. The next phase of the project will include a new outdoor training area, to be completed by the end of 2008.

25. From July 2006 to June 2007, the Agency organized 67 training courses and workshops for international, regional and national audiences. Thirty-nine Member States hosted training activities for more than 1650 participants from 90 States. The outcome of this work is discussed later in this report<sup>10</sup> but the Secretariat assesses that these upgrades and training activities have made a substantial improvement in States' capacity to prevent, detect and respond to incidents involving nuclear or other radioactive material.

26. The Agency is in the process of further streamlining the education and training programme. Increased emphasis will be given to the establishment of regional and national centres by Member States, at which training can be convened periodically. Also, continued support will be given to establishing higher level education, modelled after the education programme in Sevastopol.

### **C.3. Technical improvements**

27. Effective nuclear security requires technical systems. To the extent possible, and subject to available resources, the Agency provides equipment and services that are urgently required for an improved level of security. The Agency also supports research and development of new technologies through Coordinated Research Projects. Since the equipment and service must be integrated in most cases into an existing system, these improvements are carried out in close collaboration with the host country. The Agency has initiated coordination efforts to ensure consistent and coherent approaches in cases when other bilateral support is provided. For these reasons, in some cases, the bilateral support is being channelled through the Agency.

### **C.4. Integrated Nuclear Security Support Plans**

28. Establishing effective nuclear security addresses a complex set of issues and is an evolving process that takes time. The Agency, working with States, consolidates nuclear security needs into integrated plans for nuclear security improvements and assistance. These Integrated Nuclear Security Support Plans (INSSP) are tailored to a State's specific needs determined through nuclear security advisory and assessment missions and other Agency information. The INSSP provides a platform for nuclear security work to be implemented over a period of time and promotes the adoption of a systematic approach to improving security while ensuring sustainability of the work undertaken. The INSSP enables effective and efficient coordination of activities from both a technical and a financial point of view, thus enabling optimized use of resources without duplication or gaps. By the identification of goals, it also enables States to take on responsibility for nuclear security improvements in a coherent manner by themselves or with external assistance, including through regional cooperation.

29. The INSSP has been recognised by the States concerned and donors as a unique tool that can optimise the use of resources and avoid duplication. The Agency is currently making the INSSPs more user-friendly to improve their value as a basis for resource estimation and coordination. The Agency has prepared 38 INSSPs, some of which still require national approval, and is implementing or planning activities in each of the States covered by a plan.

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<sup>10</sup> See section F.4.1.

## **D. Results and Achievements**

### **D.1. Activity Area I: Needs Assessment, Analysis and Coordination**

30. The objective of this activity is to provide a structured and coherent approach to assist States to enhance their nuclear security. This requires an information driven system for identifying needs and vulnerabilities, assigning priorities, monitoring and assessing the progress of measures being implemented and evaluating results. The Agency is in the process of bringing together the various components of such a system. These components include information on illicit trafficking and other unauthorised activities (ITDB) together with its analysis; information gathered in the course of Agency nuclear security missions; relevant information already available in established Agency databases; the INSSPs; relevant information from the nuclear security project management database (EPSS) and training management system; and information supplied by States or available through open sources. Steps are underway within the Agency to improve existing electronic and to develop new electronic data bases; and to provide the essential connectivity which will ensure an effectively networked system. This information is protected in accordance with the Agency's confidentiality regime. All activities under the Plan are, where appropriate, coordinated with other international organisations, regional organisations and donor States.

#### **D.1.1. IAEA Illicit Trafficking Database (ITDB)**

31. As of 1 July 2007, 95 States<sup>11</sup> (65% of the IAEA Member States) participate in the ITDB programme on a voluntary basis.

32. The States ITDB Points of Contact (POC) constitute a network for interaction on questions related to illicit trafficking in nuclear and other radioactive material. The network consults on matters of common interest through periodic meetings and correspondence. During the reporting period, the Agency began to implement recommendations from the 2006 POC meeting. These included issuing a revised Incident Notification Form (INF) to POC together with an action plan for the transition to an optional secure electronic dissemination of information. The Agency has developed sub-regional workshops on illicit nuclear trafficking information management and coordination with the goal of strengthening Member States' capacities to cooperate in preventing and combating illicit trafficking. These workshops will help achieve enhanced awareness and understanding of illicit trafficking incidents and trends, support national risk assessments, and promote an enhanced culture of information management, coordination and sharing; and help increase participation in the ITDB programme.

33. In addition, following the conclusion of a Cooperation Arrangement, the Agency has strengthened its interaction with Interpol. Project Geiger, which aims at improving States' ability to combat illicit trafficking, is a good example of close cooperation and coordination of information collection and analytical activities between the Agency and Interpol and includes the development of joint analytical products to be disseminated to the ITDB POCs and Interpol national focal points.

34. During the reporting period, 304 incidents were reported to the ITDB, 171 of which were reported to have occurred during 1 July 2006–30 June 2007. This included 46 cases where there was evidence of criminal activity, such as theft. One incident involved the seizure of 79.5 g of 89% HEU

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<sup>11</sup> Algeria, China, Qatar, Thailand and Yemen have joined the ITDB programme since 1 July 2006. The Republic of Montenegro and the Republic of Serbia (formerly the Republic of Serbia and Montenegro) now participate in the ITDB as separate States.

from a group of criminals that had earlier attempted to sell the material. It is not known whether the material was a sample of a larger quantity available for illegal purchase or at risk of theft.

35. The data demonstrate the existence of a persistent problem regarding the theft or loss of radioactive material, mainly radioactive sources. In about 70% of reported incidents occurring between 1 July 2006 and 30 June 2007, the lost or stolen radioactive sources have not been recovered. A substantial proportion of incidents reported to the ITDB in the past year involve the recovery of 'orphan sources', radioactive sources in unauthorised possession and unauthorised disposal of radioactive sources. This indicates ongoing weaknesses and vulnerabilities in measures to control and secure radioactive sources. Concern is likewise increased by the fact that, in many cases, the theft or loss of these materials occurred earlier but had not been previously reported to the ITDB, suggesting that it had not previously been detected. Such incidents can, however, also reflect the successful efforts of States to locate and secure orphan sources and to detect illicit trafficking.

36. To improve the collection of information for the ITDB, the Agency has adopted a more proactive information collection strategy including information collection visits to States. The results of such visits provide more comprehensive and complete information to the ITDB and contribute to the Agency's assessment of countries' nuclear security needs and could become a basis for further support. ITDB analytical products are used in awareness briefings at various national, regional and international training activities, at international conferences and seminars, and to support Agency nuclear security activities, such as missions, needs assessments and the development of documents.

#### **D.1.2. Other international organizations**

37. The Agency continued to cooperate with other international and regional organizations such as Europol, Interpol, the Institute for Transuranium Elements (ITU), the Organization for Security and Co-operation in Europe (OSCE), the United Nations Interregional Crime and Justice Research Institute (UNICRI), United Nations Office on Drugs and Crime (UNODC), the Universal Postal Union (UPU) and the World Customs Organization (WCO). Activities included participation in training courses and workshops, information sharing and technical advice including inputs to the drafting of IAEA Nuclear Security Series documents. In the past year, the Agency has established an interactive relationship with the OSCE, including regular information exchange and coordination. In addition, the Agency is cooperating with UNICRI on the development of a project to use ITDB techniques in the biological and chemical fields.

### **D.2. Activity Area II: Prevention**

38. The objectives of this activity area are to obtain the universal adherence and political commitments by States to the relevant, legally binding and non-binding international instruments and to achieve effective protection, control, accountancy and registry of all nuclear and other radioactive material and associated facilities, as requested by a State.

#### **D.2.1. Physical protection improvements**

39. The Agency continued to assist States in improving parts of the physical protection of facilities and locations with nuclear and other radioactive material. Such improvements have been carried out in Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Kazakhstan, Montenegro, Serbia, Tajikistan, and Uzbekistan. The Agency has also supported Kyrgyzstan's regulatory authorities in developing a regulatory and inspection infrastructure and to improve nuclear security in the country.

40. In March 2007, the Agency convened a technical meeting with representatives from all countries having received research reactors under Agency "Project and Supply Agreements". Many of these reactors are in need of physical protection improvements. The outcome of this meeting included

an Action Plan to improve the security at these research reactors. For several countries, the support required has been included in an INSSP.

41. National radioactive waste storage capacity is inadequate in many States. In some States, the storage is insufficiently controlled and protected. The Agency is working with several States to improve security of central national storages of radioactive waste, in line with the nuclear security framework. For this work, joint activities are performed with the host country, any bilateral support partner and the Agency.

### **D.2.2. Transport security**

42. The Nuclear Security Series guide *Security of Radioactive Material during Transport*, to be published in 2007, contains guidelines and recommendations and complements and adds to the existing transport safety guidance. A methodology to evaluate existing transport security requirements has been developed and will shortly be implemented. In addition, the Agency developed transport security training material which covers transport security threats, international requirements and guidance, and transport security technologies and controls. In May 2007, a pilot training course using this material was held in China for a regional audience. The course will be repeated for an audience in the Middle East later in the year.

### **D.2.3. Recovery and Conditioning of Spent Radioactive Sources**

43. As a result of concerted efforts by the Agency and a number of Member States to search for and secure orphan sources, a number of high-activity vulnerable radioactive sources were discovered. The Agency together with the States concerned has developed a plan to improve the security of such sources in Africa, Asia and Europe.

44. The conditioning and removal of high-activity radioactive sources directly contributes to the reduction of the threat of that material being used in malicious acts including nuclear terrorism. In the past year, 13 neutron sources were conditioned in Australia for repatriation to the supplier State, and over 500 high-activity, radioactive sources were recovered and placed into safe and secure storage facilities in Armenia, Azerbaijan, Bulgaria, Croatia and Kyrgyzstan. In addition, one radioisotope thermoelectric generator was recovered and repatriated to the supplier State. In 2007, the Agency, jointly with the Russian Federation, began assisting the national nuclear authorities of Kazakhstan, Tajikistan and Ukraine in securing vulnerable disused radioactive material of Russian origin, including high-activity sources contained in radioisotope thermoelectric generators and irradiators. Plans have been developed and initiated for the dismantlement of these sources and their subsequent transport to secure storage.

45. The recovery, handling and conditioning of spent high activity radioactive sources (SHARS) has been a complex task due to the need for an extensive infrastructure and technical expertise to carry out these activities. To overcome this challenge, the Agency has developed a mobile hot cell that enables spent sources to be conditioned and readied for long-term storage. In March 2007, the pilot operation of the SHARS installation was successfully carried out. Following the pilot operation, conditioning operations are planned in several African States and in South America. It is expected that SHARS installations will be instrumental in solving chronic problems associated with the recovery, handling and conditioning of high-activity used sources throughout the world.

46. In February 2007, a new and expanded version of the International Catalogue of Sealed Radioactive Sources and Devices (SOURCE) was launched<sup>12</sup>. SOURCE is an important resource for

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<sup>12</sup> Further details are available on [www.iaea.org](http://www.iaea.org)

regulators, emergency response teams, customs authorities, law enforcement organizations and others on information regarding industrially manufactured radioactive sources and devices, enabling the identification of orphan radioactive sources and devices to enable their safe and secure handling. Currently SOURCE has 85 national coordinators from 49 Member States and two international organizations accessing the Catalogue.

#### **D.2.4. Human resource development for Prevention<sup>13</sup>**

47. More than 900 participants from 75 States were trained. The training modules covered basic and advanced understandings of physical protection and a systematic methodology to design and evaluate nuclear facilities' physical protection systems that are effective against theft and sabotage.

48. Specialised physical protection courses covered the methodology to develop the design basis threat (DBT), the protection against sabotage, vital area identification, security of radioactive sources, security culture and prevention against insider threats.

### **D.3. Activity Area III: Detection and Response**

49. The objective of this area is to enhance capabilities of States to detect, interdict and respond to illegal acts involving nuclear and other radioactive material and associated facilities.

#### **D.3.1. Improving technical detection capabilities at borders**

50. From mid-2006 to mid-2007, the Agency supplied detection equipment to 29 States. This equipment, which includes portal monitors, radionuclide identification devices, personal radiation detectors and other equipment, enhances detection ability at borders. The supply of equipment was accompanied by the requisite training.

#### **D.3.2. Nuclear Security Equipment Laboratory**

51. To ensure functionality of detection equipment supplied to States, the Agency has established the Nuclear Security Equipment Laboratory (NSEL), to test detection equipment prior to delivery and to arrange for the correction of any problems and for instrument replacement as necessary. The NSEL plays a role in the coordination, procurement and delivery of radiation detection equipment to States, helps to conduct training courses on combating illicit trafficking and provides technical advice and hands-on training with detection equipment.

52. Between July 2006 and June 2007, the NSEL performed acceptance tests on more than 900 instruments; this was the largest amount of nuclear security equipment tested in any year since the Laboratory was founded. NSEL also performed acceptance tests on radiation portal monitors in the field. As noted in previous reports, a significant proportion of the instruments failed acceptance tests (around 14%). The Agency continues to work with suppliers to ensure that the equipment supplied has the required functionality.

#### **D.3.3. Nuclear security support for major public events**

53. Major public gatherings could be vulnerable to acts by terrorists or criminals. The security arrangements at such events must therefore integrate measures to protect against possible the use of nuclear or other radioactive material for malicious purposes. This is accomplished by the use of detection equipment, having trained and educated staff, access to information support, and plans for

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<sup>13</sup> Further details are available on [www.iaea.org](http://www.iaea.org)

response, including for radiological emergencies. In this regard, a nuclear security guide has been developed and is ready for publishing.

54. The Agency assists States, upon request, in developing and implementing measures to prevent incidents of nuclear terrorism at major public events with advice, equipment and training. Drawing on ITDB reporting, information support and advice in the areas of emergency preparedness and response is provided. In the course of the past year, the Agency has worked jointly with the governments of Brazil and China respectively for the 2007 Pan American Games and the 2008 Summer Olympic Games. The Agency also has begun discussions with the relevant authorities in South Africa for a project to advise the country on nuclear security arrangements for the 2010 World Cup.

#### **D.3.4. Research and Development**

55. The detection capability at borders depends on the availability of effective, user-friendly equipment. Likewise, law enforcement organizations benefit from having nuclear forensics capabilities available to characterize seized material and help in recovery and return actions for seized material. The Agency is supporting research and development for this purpose and has initiated two new nuclear security Coordinated Research Projects (CRPs) to improve technology for instruments and to promote the development of procedures and/or techniques for categorization and characterization of materials, for the preservation of evidence, for sampling and for transporting material as part of nuclear forensic efforts.

#### **D.3.5. Human resource development for Detection and Response<sup>14</sup>**

56. The Agency offers a range of training courses to help States improve capabilities to detect and respond to illicit trafficking and other unauthorized acts involving nuclear and other radioactive material. In response to requests from States, the Agency focused on providing more specialised national training courses. More than 700 participants from 38 States were trained to understand relevant international legal instruments, to upgrade border monitoring capabilities as part of efforts to combat illicit trafficking and to prepare response plans for nuclear and radiological incidents and emergencies.

57. The Agency is in the process of offering more specialised training on advanced detection equipment for front line officers and mobile expert support team members. The training will be concentrated at dedicated training centres, where the necessary radioactive material can be obtained for training purposes, as well as an adequate range of various instruments. An important step towards this has been taken together with the Greece Atomic Energy Commission (GAEC) in Athens, which supports these efforts using the capacity developed in preparation for the 2004 Olympic Games. Over the past year, 45 specialised officers from five countries benefited from this specialised training.

#### **D.3.6. Border Monitoring Working Group**

58. In 2006, the Agency established the Border Monitoring Working Group (BMWG) with representatives from the European Commission's Joint Research Centre, the Council of the European Union and the U.S. Department of Energy's National Nuclear Security Administration to promote and coordinate international cooperation on detection monitoring activities at strategic border crossing points and selected locations within States related to nuclear security, specifically the illicit trafficking of nuclear and other radioactive material. The Working Group serves as a forum for discussion and exchange of information on plans and programmes to be implemented in order to optimize the use of

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<sup>14</sup> Further details are available on [www.iaea.org](http://www.iaea.org)

resources and with the view of coordinating specific projects carried out by contributors in coordination with the recipient States. The Working Group, which meets twice a year, also endeavours to promote collaboration at borders between States and internationally.

## **D.4. Activities Supporting Nuclear Security**

59. The Nuclear Security Plan 2006–2009 was designed to take full advantage of the synergies between safety, security and safeguards. This concept has been applied in implementing the activities described above. In so far as activities originally established for safety or safeguards purposes contribute to nuclear security, the activities receive funding from the NSF.

### **D.4.1. Emergency Response**

60. The Agency's Incident and Emergency Centre (IEC) serves as the focal point for international preparedness, communication and response to radiological emergencies, and provides a 24/7 service to assist Member States in dealing with nuclear and radiological events. In March 2007, the IEC was activated to basic response mode at the request of the competent authority in reaction to a bomb threat against one nuclear power plant. The IEC facilitated information exchange during this event to competent authorities in neighbouring States, using the ENATOM arrangements.

### **D.4.2. HEU fuel takeback and return to the country of origin**

61. Reducing inventories of vulnerable nuclear material, e.g. high enriched uranium (HEU) research reactor fuel, provides effective support to nuclear security. The Agency has provided extensive assistance to Member States to remove or reduce inventories of high risk materials such as HEU fuel or high activity sources. Since 2002, the Agency has arranged for the repatriation of about 433 kg of unirradiated HEU fuel from nine States. These efforts were supported through workshops, operative guidelines and by purchasing spent fuel casks for use in shipments<sup>15</sup>.

62. In addition to the removal or reduction of HEU fuel, the Agency continues to support the conversion of research reactors using HEU to being able to use low enriched uranium (LEU) fuel<sup>16</sup>.

## **E. International Cooperation**

### **E.1. European Union**

63. In December 2003, the European Union established its Strategy against the Proliferation of Weapons of Mass Destruction. The strategy includes working with the Agency in support of its NSP. Accordingly, in 2004, the European Union adopted a first Joint Action implemented by the Agency from January 2005 to April 2007. The Action entailed concerted work to secure nuclear and other radioactive material, including that in non-nuclear use, and to enhance detection and response capabilities in States in South-Eastern Europe, Central Asia and the Caucasus. A second Joint Action was adopted in July 2005, which extended assistance to States in the Middle East and North Africa and added a project on providing support to strengthen national legislative frameworks for the implementation of safeguards agreements and additional protocols. The implementation period of the

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<sup>15</sup> Further details are available on [www.iaea.org](http://www.iaea.org)

<sup>16</sup> Further details are available on [www.iaea.org](http://www.iaea.org)

second Joint Action runs from February 2006 to December 2007. In June 2006, a third Joint Action was adopted, extending further the geographic area for possible assistance to include all African States. Projects under the third Joint Action will be implemented in 2007–2008.

## **E.2. Cooperation agreements with Member States**

64. The Agency recognises that States have specific and varying needs for assistance in the area of nuclear security. In order to fulfil these needs, the Agency has carried out activities pursuant to cooperation agreements with Member States.

- **Brazil** – Signed in May 2007, a Cooperation and Support Agreement between the Agency and Brazil's National Nuclear Energy Commission (CNEN) established the basis for the Agency's cooperation with Brazil in helping the country to ensure the nuclear security of the Pan American Games.
- **China** – In June 2007, the Agency and the China Atomic Energy Authority (CAEA) signed a Practical Cooperation Arrangement on Nuclear Security to enable, in the first instance, the Agency to deliver a programme of assistance for enhancing the nuclear security of the major public events associated with the 2008 Summer Olympic Games.
- **Pakistan** – In December 2005, the Agency established a partnership programme for human resource development with the Pakistan Nuclear Regulatory Authority (PNRA). The Programme includes training courses, on-the-job training and a limited amount of detection equipment for a newly constructed Nuclear Security Training Centre in Islamabad. Additional instruments have been provided, through the use of Pakistan's own resources, to front line officers.
- **Qatar** – In June 2007, the Agency signed a Practical Cooperation Arrangement with the Government of Qatar to cover Agency assistance to Qatar's efforts to enhance the effectiveness and efficiency of Qatar's nuclear security.
- **Saudi Arabia** – In May 2007, the Agency transmitted to Saudi Arabia's Naif Arab University for Security Services (NAUSS) a set of Practical Arrangements for the enhancement of cooperation between NAUSS and the Agency. The Arrangements provide for the promotion of institutional exchanges, the exchange of information and the organization of symposia, meetings and training on relevant nuclear security issues.

65. The Radiological Security Partnership (RSP) covers risk-reduction activities and focuses on the security of vulnerable, high risk radioactive sources. The RSP was initiated by the U.S. Department of Energy to address "the potential threats from under-secured high risk radioactive sources". Under the auspices of the RSP, the Agency and the United States of America have entered into Regional Radiological Security Partnerships with: Australia, for increasing awareness on the security of sources and human resource development in Southeast Asia; India, for the provision of training, instrumentation, technical support and awareness building in and among States in South Asia; and South Africa, for recovering and securing disused, high-activity sources.

## **E.3. Bilateral and Multilateral Coordination and Cooperation**

66. In recent years, the emergence of several new bilateral and multilateral initiatives has strengthened and enhanced the nuclear security and counter-terrorism framework. All these initiatives have recognized the Agency's activities that assist States in strengthening measures to protect against nuclear terrorism and the unique role, functions and expertise of the Agency in the nuclear field. The implementation of the NSP addresses the nuclear security component of the multilateral initiatives.

### **E.3.1. UN Counter Terrorism Implementation Task Force**

67. On 8 September 2006, the UN General Assembly adopted the United Nations Global Counter-Terrorism Strategy. This strategy spells out concrete measures for States to take individually and collectively to address the conditions conducive to the spread of terrorism, to prevent and combat terrorism and strengthen their individual and collective capacity to do so, and to protect human rights and uphold the rule of law while countering terrorism. The United Nations entities and other relevant independent international organizations have taken action in line with the strategy both within their individual mandates and through joint efforts in the context of the Counter Terrorism Implementation Task Force (CTITF), which was established in 2005 to ensure improved coordination between the UN entities and other independent international organizations involved in counter terrorism efforts. The Agency has participated in CTITF activities, both in New York and Vienna and is contributing to ongoing efforts to establish possible new coordination modalities subject to its mandate, relevant resolutions of the Board of Governors and General Conference, Financial Regulations and Rules and confidentiality obligations.

### **E.3.2. The 1540 Committee**

68. Since its establishment in 2004, the Committee of the Security Council established pursuant to Security Council resolution 1540 (1540 Committee) has conducted outreach activities, including regional meetings, to remind States of their obligations under resolution 1540, to increase reporting under the resolution and to enable the exchange of relevant information and experiences between States. In the past year, and upon the request of the Chair of the 1540 Committee, the Agency has participated in the regional meetings hosted by Austria, China, Ghana, Jamaica, Kazakhstan and Peru. The Agency's participation in these regional meetings has further enabled the Agency to inform States about the programmes and activities carried out by the Agency that can assist States in preventing nuclear material and related technologies from falling into the hands of non-State actors and accordingly helped States fulfil their international obligations, including those required under UNSC resolution 1540.

### **E.3.3. United Nations Office on Drugs and Crime (UNODC) and Organization for Security and Co-operation in Europe (OSCE)**

69. In November 2006, the Agency participated in the Second Sub-regional Expert Workshop on International Cooperation on Counter-Terrorism, Corruption and the Fight against Transnational Organized Crime, jointly organized by the Organization for Security and Co-operation in Europe (OSCE) and the United Nations Office on Drugs and Crime (UNODC), held in Bucharest, Romania. In April 2007, the Agency took part in a Regional Workshop on the Suppression of Acts of Nuclear Terrorism co-organized by OSCE and UNODC, which was held in Tashkent, Uzbekistan. Also in April 2007, the Agency participated in the 16th Session of the Commission on Crime Prevention and Criminal Justice in Vienna, Austria and delivered a statement relating to "facilitating the ratification and implementation of the international instruments to prevent and combat terrorism".

## **E.4. Third-party initiatives related to nuclear security**

### **E.4.1. G8 Global Partnership**

70. The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction was established in 2002. As part of their support for the G8 Global Partnership, Canada and the United Kingdom have made contributions to the Nuclear Security Fund. At their Heiligendamm Summit in Germany in 2007, the G8 reiterated their commitment to improving nuclear security; highlighted the need to promote nuclear security guidelines and the increased use of the Agency's integrated review

services in establishing a global nuclear security partnership; called upon all States to join, as appropriate, and to implement international instruments relating to nuclear security; and welcomed the establishment of the IAEA Incident and Emergency Centre.

#### **E.4.2. Global Initiative to Combat Nuclear Terrorism**

71. The Presidents of the Russian Federation and the United States of America announced the Global Initiative to Combat Nuclear Terrorism (GICNT) in July 2006 in the margins of the G8 meeting in St Petersburg. Through the GICNT, participating countries have adopted principles for combating nuclear terrorism. The GICNT recognises the Agency's role in the field of nuclear security and welcomes Agency contributions to GICNT objectives through its ongoing activities and technical expertise. The Agency has been accorded observer status.

#### **E.4.3. Seminar on Strengthening Nuclear Security in Asian Countries, Tokyo**

72. In November 2006, a Seminar on Strengthening Nuclear Security in Asian Countries was held in Tokyo, Japan, attended by 105 representatives from 19 States. The objective of the seminar was to increase awareness and understanding of countries in Asia of the need to strengthen nuclear security through the implementation of existing and strengthened international instruments and by enhanced cooperation within the region. The seminar considered ongoing efforts to improve coordination and cooperation to strengthen regulatory, technical and administrative infrastructures necessary for building an effective nuclear security framework.

## **F. Programme Implementation and Resources**

73. The adoption of the NSP 2006–2009 resulted in a number of changes to programme implementation brought about by, inter alia, the redefinition of activity areas. Over the past year, efforts have been made to systemise and consolidate programme implementation and to improve management systems, including through a reorganization of the Office of Nuclear Security to mirror the activity areas of the NSP. Specific systems and procedures have been introduced to manage and continuously track funds throughout a wide spectrum of anticipated uses.

74. Implementation of the NSP depends on voluntary contributions received from Member States and organizations. Most of the contributions are targeted for specific use, with more or less strict conditions. The Agency enters into discussion with the potential donor before the donation is made, in order to better balance the allocation of funds to all activity areas of the Nuclear Security Plan.

### **F.1. Nuclear Security Electronic Programme Support System**

75. The Agency continued to utilize and expand the Nuclear Security Electronic Programme Support System (EPSS), a web-based system to plan and monitor the implementation of the large number of nuclear security activities, projects and tasks. During the past year, a significant upgrade to the security of the system was made in order to guarantee the integrity of data. This enabled a growing in-house use of the system as an integral tool in planning and implementing nuclear security work.

### **F.2. Donor coordination and donor-recipient coordination**

76. In the course of the reporting period, the Agency held three meetings with donors to the NSF, States running bilateral assistance programmes and States participating in other initiatives. These

meetings provided a forum for an informal exchange of information on the implementation of the nuclear security programme and other programmes with the aim of increasing effectiveness and efficiency. In addition, the Agency is organising ad hoc meetings between States seeking assistance in their national efforts to improve nuclear security and potential donors. Preparations for three such meetings are underway.

### **F.3. Advisory Group on Nuclear Security**

77. Implementation of the Agency's nuclear security activities continued to benefit from advice provided to the Director General by the Advisory Group on Nuclear Security (AdSec). AdSec has met twice a year since 2002 and provides advice on a wide range of nuclear security matters. During the period covered by this report, AdSec provided recommendations and suggestions on various aspects of the implementation of the Nuclear Security Plan for 2006–2009, including human resource development and the establishment of the Nuclear Security Series of documents. AdSec also provided a number of recommendations and suggestions on the scope and structure of individual documents being developed for publication in this new series.

### **F.4. Programmatic and organizational issues**

#### **F.4.1. Programme evaluation**

78. The nuclear security programme is subject to the Agency's oversight and evaluation process. In addition, to obtain important programmatic feedback, an objective assessment of the impact of activities implemented, the Agency has initiated a systematic web-based evaluation of the training programme. As a first step, the Agency has carried out a survey of participants in training courses that took place in the calendar year 2006. While the results of the survey are still being analysed, initial results show that the training programme has had a positive impact on the awareness amongst governments and organizations of relevant aspects of nuclear security. The Agency will use the information gained through the survey to further fine-tune the human resource development programme.

79. The Agency is now carrying out an evaluation of a sample of advisory missions carried out in recent years as well as technical upgrades provided as a result of the missions to assess whether recommendations for improvements made during those assessment missions have been implemented and learn more about the effect of the advice given. The Agency will provide further information on this evaluation in due course.

#### **F.4.2. Programme Prioritisation**

80. The Agency, as mentioned above, gives priority to assisting States to implement the relevant legally binding and non-binding international instruments that constitute the new nuclear security framework. These overall priorities reflect those of the NSP and the Medium Term Strategy. The Agency has established a methodology to determine which States should be given priority in receiving support. The methodology takes account of objective factors such as the level of nuclear activity and quantity and type of nuclear material used in a State, the presence of radioactive sources in a State and the status of the relevant legislation as well as technical and administrative nuclear security systems to determine the level of priority that should be given to each proposed activity. In addition, priority is given to the systematic wide-ranging activities such as the development of the Agency's Nuclear Security Series, without which the individual activities would lack sufficient basis. As identified in last year's report, other issues such as the availability of funds and the level of nuclear security at different facilities within a State have to be taken into account.

## F.5. Nuclear Security Fund

81. The implementation of the NSP continues to be predominantly dependent on the donation of extra-budgetary funds by Member States and others to the Nuclear Security Fund (NSF). In the period covered by this report, pledges had been made by Australia, Canada, Czech Republic, European Commission, Finland, France, Germany, Ireland, Italy, Japan, Republic of Korea, Netherlands, New Zealand, Pakistan, Qatar, Spain, Sweden, United Kingdom, United States of America and the Nuclear Threat Initiative. A number of these pledges have been made to fund nuclear security related activities in the State making the donation. Recent examples include donations from the Netherlands, Pakistan and Qatar. In addition to financial contributions, Member States have provided “in-kind” contributions such as donations of equipment, cost free experts, the use of facilities and the hosting of regional meetings and training activities. This support is an important and substantial contribution to the programme.

82. The NSF relies on relatively few donors who may wish to place conditions on the use of the funds that they provide. In the course of the year, the Secretariat has increased its dialogue with donors to identify ways to reduce conditions placed on donations.

83. NSF expenditures and disbursements are shown in Table 1. As was noted by the External Auditor, more emphasis has been placed on accelerating project planning and implementation, and disbursements in 2006 increased considerably over the previous year. Indications are that disbursements will again be high in 2007.

**Table 1: NSF expenditures and disbursements**

<b>2002–2003</b>	<b>Disbursements</b>	<b>5,746,043</b>
<b>2004</b>	<b>Disbursements</b>	<b>7,662,548</b>
<b>2005</b>	<b>Disbursements</b>	<b>8,828,591</b>
<b>2006</b>	<b>Disbursements</b>	<b>15,451,894</b>
<b>2007 (as of 30 June 2007)</b>	<b>Expenditures</b>	<b>10,997,605</b>
	<b>Precommitments</b>	<b>4,738,699</b>
	<b>TOTAL</b>	<b>15,736,304</b>

All figures in United States Dollars

## G. Trends: looking ahead

84. Official and media reports as well as events indicate that the threat of nuclear terrorism remains real. There are no grounds for the international community to consider relaxing its vigilance. The international community must continue to work towards meeting the norms of an international security framework based on the relevant international instruments. In doing so, States will have to address the legacy of past approaches to nuclear security and to ensure that improvements in security are sustained. This will require the international community to translate political commitments into tangible action with a view to achieving adherence to and implementation of the nuclear security framework and keeping the latter under review to ensure the framework’s responsiveness to emerging

threats. This is particularly important in the light of the reported increased interest in the use of nuclear energy. The Agency plans to hold an international symposium at the end of 2008 that will contribute both to that process and help to reassess the global nuclear security threat.

85. A number of initiatives, both governmental and non-governmental, have emerged that are designed to promote, inter alia, adherence to the international instruments relevant to nuclear security. The Agency will continue to work with these initiatives and, as appropriate, to act as an international focal point for matters related to the implementation of the nuclear security framework.

86. The Agency will continue to provide assistance through the nuclear security programme but it will do so against a backdrop of scarcity of resources. In the course of the next year, the Agency will continue to give priority to the worldwide improvement in nuclear security through the implementation of the NSP; to develop the Agency's coordination role in particular by organising meetings between States and potential partners for their national efforts to improve nuclear security; to extend the systematic evaluation of activities undertaken under the NSP; and to continue to accelerate efficient programme delivery. The Agency will continue to develop and utilise innovative methods of programme delivery in particular through e-learning and the improvement of knowledge networks through contacts with national and regional bodies.