IAEA
Atoms for Peace

Board of Governors
General Conference

GOV/2008/35-GC(52)/12
Date: 22 August 2008

General Distribution
Original: English

For official use only

Item 7 of the Board's provisional agenda
(GOV/2008/33)
Item 14 of the Conference's provisional agenda
(GC(52)/1)

Nuclear Security Report 2008

Measures to Protect Against Nuclear Terrorism

Report by the Director General

Summary

- At its fifty-first regular session (2007), the General Conference requested the Agency to prepare an Annual Report highlighting significant accomplishments of the prior year in the area of nuclear security and establishing goals and priorities for the year to come for the fifty-second regular session (2008) of the General Conference. This Report has been produced in response to the request contained in resolution GC(51)/RES/12 and covers the period 1 July 2007–30 June 2008.

Recommended Action

- It is recommended that the Board of Governors:

  a. Take note of the Nuclear Security Report 2008 on Measures to Protect Against Nuclear Terrorism;

  b. Transmit this Report to the General Conference with a recommendation that States continue to contribute to the Nuclear Security Fund, 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 adhere to the Amendment to the Convention on the Physical Protection of Nuclear Material and to promote its early entry into force; encourage all States to act in accordance with the object and purpose of the Amendment until such time as it enters 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. Encourage States to participate in the Illicit Trafficking Database programme.

Nuclear Security Report 2008

Measures to Protect Against Nuclear Terrorism

Report by the Director General

Executive Summary

1. The potential of a malicious act involving nuclear or other radioactive material is a continuing worldwide threat. Existing data indicate circumstances in which nuclear and other radioactive material are vulnerable to theft, are uncontrolled or in unauthorized circulation. An international nuclear security regime comprised of legally binding and non-binding instruments, the Agency's Nuclear Security Plan for 2006–2009[1], and other international, regional and national initiatives, reflects broad international recognition of this threat and the need for collective action to respond and to keep pace with evolving circumstances.

2. The Agency continues to assist States' efforts to build and develop nuclear security capacity that is capable of a sustainable response. These activities are designed to implement the Nuclear Security Plan 2006–2009 and also reflect the evolution of a programme that has achieved sufficient maturity to evaluate its own accomplishments and shortcomings, set meaningful priorities and indicators of success, and take into consideration the evaluations and inputs of other interested stakeholders and groups, including donors to the Nuclear Security Fund (NSF).

3. Developing and sustaining an effective global nuclear security regime requires a variety of measures. Though the responsibility for nuclear security rests entirely with individual States, the effectiveness of national efforts can be enhanced if they are implemented in synergy with international programmes for strengthening protection of nuclear and other radioactive material, detecting and responding to malicious acts, and collecting and sharing relevant information.

4. International participation in data gathering and data sharing programmes now involves a majority of the Agency's Member States; training and educational programmes are widely sought and security training/capacity building activities have reached thousands of individuals throughout the world. Major public events are being protected against the threat of a malicious dispersal of radioactivity; and capabilities for effective border control to guard against illicit import and export of nuclear or other radioactive material are being built.

5. The Agency has been assessing ways to strengthen the management of its Nuclear Security Plan and improve efficiencies to enable optimal programmatic choices and use of resources, as it continues through 2008 and begins the process of developing the Nuclear Security Plan 2010–2013.

6. In the period covered by the Report (1 July 2007–30 June 2008), the Agency:

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[1] Included in GOV/2005/50.

- achieved increased participation in the Illicit Trafficking Database Programme by adding five States to the programme, which now involves 100 States; developed and improved the analysis, gathering and consistency of the data reported;
- assisted States in improving their national legislative and regulatory frameworks, as well as the physical protection measures, accounting and control, transport security and nuclear security culture;
- assisted in physical protection upgrades in 15 States;
- assisted in the repatriation of almost 108 kg of unirradiated and irradiated high enriched uranium research reactor fuel to the supplying country;
- assisted in the recovery, conditioning and repatriation of over 600 radioactive sources, and assisted States in managing and disposing them in view of their nuclear security risk;
- addressed States' pressing border control issues by providing equipment and assistance to augment detection and response capabilities and coordinated the work of the Border Monitoring Working Group, and provided assistance to relevant States to enhance nuclear security at major public events;
- organized some 65 training courses and workshops reaching more than 1600 participants from 120 States;
- developed six additional Integrated Nuclear Security Support Plans (INSSP), in cooperation with the relevant State authorities, bringing the total number of INSSPs developed to 44;
- facilitated increased State adherence to and implementation of binding and non-binding nuclear security instruments; and
- advanced the development of the nuclear security regime with the publication of three documents in the IAEA Nuclear Security Series and completed the development of three documents that will be published shortly.

7. The Agency has been focusing on the priorities and approaches set forth in the Nuclear Security Plan 2006–2009, including continued efforts to coordinate with bilateral and multilateral initiatives that aim to complement the efforts of the Agency, and has worked to develop synergies that will result in improved nuclear security as well as cost and work savings. Funding for the Agency's nuclear security activities remains dependent on a few large donors and the vast majority of funding is provided with restrictions that continue to make setting overall programmatic priorities difficult.

8. Further details of the IAEA nuclear security activities for 2008 can be found in the document entitled "Overview of the Agency's Nuclear Security Activities – 2008" (in English only) available on line on GovAtom or in hard copy upon request.

A. Continuing Vulnerabilities

9. Nuclear and other radioactive material in use, in storage and in transport must be managed with the highest attainable standards for nuclear security and thus kept out of reach of those who would seek to use it for malicious purposes. Continuing vulnerabilities exist and must be addressed by prevention, detection and response measures.

10. The objective of the Agency's nuclear security programme is to contribute to achieving optimum 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 and maintain effective national nuclear security regimes, promoting improvements in the global nuclear security regime and assisting States in the effective implementation of relevant international legal instruments.

A.1. Global Inventories of Nuclear and Other Radioactive Material

A.1.1. Nuclear Material and Facilities

11. While the obligation for establishing and maintaining a State system of accounting for and control of nuclear material (SSAC) — which is included in comprehensive safeguards agreements concluded between the Agency and States in connection with the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and other comparable non-proliferation agreements — requires States to have national controls over nuclear material, such controls do not automatically mean that the nuclear material is being protected/secured at internationally accepted levels.

12. According to the 2007 Safeguards Implementation Report[2], the Agency, as of 31 December 2007, applied safeguards to a total of 949 facilities (including power reactor facilities, facilities with research reactors and critical assemblies) and at 368 locations outside facilities containing small amounts of nuclear material.

13. Safeguarded facilities contained: 151 749 significant quantities (SQs)[3] of nuclear material, comprised of 11 056 SQs of un-irradiated plutonium, including fresh MOX fuel, outside reactor cores; 116 462 SQs of plutonium contained in irradiated fuel, including plutonium in fuel elements in reactor cores; 320 SQs of high enriched uranium (HEU) and 19 SQs of U-233; 15 147 SQs of low enriched uranium (LEU); and 8 745 SQs of source material. This amounts to a 3% increase in total SQs over 2006. Annual discharges of spent fuel from the world's reactors total about 10 500 tonnes of heavy metal. There is no similar source of information about nuclear material holdings at facilities where the Agency does not apply safeguards.

A.1.2. Radioactive Sources

14. There is no worldwide central repository of information on radioactive sources in States. Radioactive sealed sources have a wide application ─ ranging from insect sterilization, radiation therapy and industrial uses to use in fire detection systems ─ and are categorized based on their potential radiation hazard[4]. The total number of sources worldwide is not known but it is a widely shared assessment that there are well in excess of 100 000 Category 1 and 2 sources and a far greater number of Category 3 sources.

15. Information provided by States under the Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct) and its Supplementary Guidance on the Import and Export of Radioactive Sources (Supplementary Guidance) will further increase the knowledge of sealed radioactive sources worldwide. This information will also assist the Agency in its planning and prioritizing of nuclear security activities. The Agency has been requested to assist States in using regional networks to discuss implementation of the Supplementary Guidance.

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[2] GOV/2008/14.

[3] Approximate amount of nuclear material for which the possibility of manufacturing a nuclear explosive device cannot be excluded.

[4] IAEA Safety Guide RS-G-19.

A.1.3. Radioactive Material in Transport

16. There is a large volume of transports of radioactive material. The World Nuclear Association estimates that about 20 million such transports are carried out throughout the world yearly[5]. Five per cent of these shipments carry nuclear material in various forms.

17. While international transports of nuclear material are covered by the Convention on the Physical Protection of Nuclear Material (CPPNM), other radioactive material and substances are not subject to international obligations other than States' voluntary undertakings under the Code of Conduct.

A.2. The Nuclear "Renaissance"

18. Many States have expressed interest in introducing nuclear power and other nuclear related applications as a result of their own assessment of their energy supply needs, climate change issues, development requirements and long term cost assessments. This presents new opportunities and challenges in designing and incorporating concepts of nuclear security at the earliest possible stage of development and aligning them with the principles of safety and safeguards. Management principles established in line with internationally accepted norms and standards will contribute to increased confidence that new nuclear power plants as well as fuel cycle facilities are built and operated in a safe, secure and peaceful manner.

19. The Agency can play an important role in this regard by facilitating the development of norms and standards, convening peer reviews and expert missions and providing advice and assistance to States on how to meet their obligations under the relevant international legal instruments and how to implement internationally developed IAEA nuclear security guidance.

B. The Nuclear Security Framework

20. As referred to in prior Agency reports on nuclear security[6], the nuclear security framework is referred to as the combination of international binding and non-binding legal instruments together with IAEA nuclear security guidance. This legal framework, together with measures to facilitate its implementation, for example training, information exchange, legislative assistance and capacity building, constitute the nuclear security regime.

C. Role of the IAEA in Strengthening Nuclear Security

21. The Agency is the primary international actor in global efforts to achieve nuclear security. In cooperation with its Member States and other international organizations, it facilitates the implementation by States of the relevant legal instruments. In response to Member States' requests, it has taken on a coordinating role with respect to the assistance provided by multilateral and bilateral programmes. In the implementation of its Nuclear Security Plan, the Agency increasingly cooperates with other international and regional organizations such as Europol, Interpol, the Institute for Transuranium Elements, the Organization for Security and Co-operation in Europe, the United Nations

[5] See www.world-nuclear.org

[6] See GOV/2007/43-GC(51)/15.

Interregional Crime and Justice Research Institute, the United Nations Office on Drugs and Crime and the World Customs Organization[7].

22. Through its legislative assistance programme, the Agency assists States to establish national legislative frameworks to implement their obligations and commitments under the relevant international legal instruments as well as United Nations Security Council resolutions.

23. The Agency helps States, upon request, to assess the status of their nuclear security arrangements and identifies good practices or recommendations for improvements. It provides expert services for evaluation and assessment that are designed to be useful to all States, as well as a comprehensive education and training programme for human resource development purposes.

C.1. Integrated Nuclear Security Support Plans (INSSPs)

24. The Agency is taking steps towards consolidating States' nuclear security needs into integrated plans for nuclear security improvements and assistance. Forty-four INSSPs have been developed, providing a framework for nuclear security work to be implemented in those States. The INSSP enables the Agency, the State concerned and potential donors financing the work to programme and coordinate activities, optimizing the use of resources and avoiding duplication.

D. IAEA Nuclear Security Activities

D.1. Needs Assessment, Analysis and Coordination

D.1.1. Overall Objective

25. Information, analysis and assessment are essential elements for programme planning and as feedback for effective programme implementation. Efforts have begun to establish an effective information architecture system in which essential information on nuclear security (for example on illicit nuclear trafficking, ongoing work and other background information) is integrated. The NSF electronic programme support system is an integral part of the architecture. To further facilitate coordination, work has started on establishing an *information portal* which may be used in communication with and between Member States and international organizations. This strengthened information management system will help to more effectively respond to requests for assistance and the requirements for reports to Member States.

D.1.2. Major Achievements

IAEA Nuclear Security Series

26. Information on nuclear security systems is highly sensitive in many cases, and must be protected from disclosure. Information security therefore is a fundamental requirement for a sustainable nuclear security regime.

27. Two IAEA Nuclear Security Series Implementing Guides were developed in 2007 for the area of information security: Computer Security at Nuclear Facilities and Confidentiality of Nuclear Security Sensitive Information. Specific training in the implementation of the guidance has been developed and tested at a pilot training event in China, held in November 2007.

[7] See section E.3 of this Report for additional information.

Illicit Trafficking Database Programme

28. Through the IAEA Illicit Trafficking Database (ITDB) programme the Agency collects information on incidents of illicit trafficking and other unauthorized activities involving nuclear and radioactive material detected at international border crossings or elsewhere. It tracks events that occurred intentionally or unintentionally, including unsuccessful or thwarted acts. The ITDB is the main source of authoritative, confirmed information on incidents of illicit trafficking.

29. Five new States have joined the ITDB programme, bringing the total number of participants to 100, as of 30 June 2008.

30. A new ITDB software platform has been developed to enable better data management and to collect and collate information on both trafficking and other security related incidents and events.

31. The Agency completed the implementation of the recommendations from the ITDB points of contact meeting in 2006, with the objective of facilitating timely exchange of useful information. To further strengthen the interaction with points of contacts, the Agency conducts meetings with them and other relevant organizations in individual States. As a result, more comprehensive and complete information is provided to the ITDB.

32. From 1 July 2007 to 30 June 2008, 243 incidents were reported to the ITDB; 143 of these were reported to have occurred during the period and the remaining 100 were reports of prior incidents. In 14 cases, individuals were arrested for unauthorized possession, including smuggling attempts, of nuclear or other radioactive materials. Twenty-one incidents reported the theft or loss of nuclear or other radioactive material, most of which have not been subsequently reported as recovered. This may indicate ongoing weaknesses and vulnerabilities in measures to control and secure these materials.

International Conference on Illicit Nuclear Trafficking

33. In November 2007, the Agency convened an International Conference on Illicit Nuclear Trafficking: Collective Experience and the Way Forward[8] which was held in Edinburgh, United Kingdom. The Conference concluded that illicit nuclear trafficking remains an international concern, with the potential for serious consequences for human life, health, property and the environment, and that efforts must continue to establish effective systems, technical and administrative, to control the movement of nuclear and other radioactive material, and to prevent and detect their uncontrolled and unauthorized movement.

Information Management and Coordination Training

34. In July 2007, a three-day regional Workshop on Illicit Trafficking Information Management and Coordination was held in Singapore. In August 2007 and May 2008, subsequent workshops were held in South Africa and Qatar, respectively. At these workshops information on unreported incidents was presented and subsequently has been incorporated into the ITDB.

D.1.3. Future Priorities

35. In the coming year, the Agency will give priority to the completion of the nuclear security information architecture. It will augment efforts for the value-added analysis of information, and continue efforts for closer interaction with points of contact in States and other international organizations. The Agency will also establish a secure website portal allowing more effective interaction with ITDB points of contacts, and for interaction with States. Furthermore, the new ITDB

[8] http://www-pub.iaea.org

database software platform will be implemented in full to enable more effective data management with easier input modules and enhanced analysis and display capabilities.

36. The Agency will give high priority to the development and advancement of INSSPs, including ways to make them more attractive to a broader cross-section of States.

D.2. Prevention

D.2.1. Overall Objective

37. A central nuclear security objective is to achieve effective protection, control, accountancy and registry of all nuclear and other radioactive material and associated facilities. This is accomplished through implementation of an internationally accepted nuclear security framework and through a broad assistance programme for physical protection and the accountability of nuclear and other radioactive material.

D.2.2. Major Achievements

IAEA Nuclear Security Series

38. Two new Implementing Guides were published: Engineering Safety Aspects of the Protection of Nuclear Power Plants against Sabotage and International Catalogue of Sealed Radioactive Source.

39. In addition, the Implementing Guide entitled Security in the Transport of Radioactive Material has been completed and is ready for publication. This document will provide States with guidance for implementing, maintaining or enhancing a nuclear security regime to protect radioactive material including nuclear material whilst in transport. The guidance contained in this document complements the Nuclear Safety Series requirements document on Transport of Nuclear Material.

Improving Regulatory Infrastructures

40. During the reporting period, the Agency continued to work with States to promote, inter alia, adherence to and implementation of international legal instruments relevant to nuclear security. Legislative assistance has been provided to Afghanistan, Albania, Algeria, Belarus, Chad, Chile, Côte d'Ivoire, Egypt, Gabon, Georgia, Iraq, Montenegro, Morocco, Niger, Qatar, Sudan, Thailand and Tunisia. In addition, draft regulations governing radiation safety and the security of radioactive sources were reviewed for Kyrgyzstan, Lebanon, Sierra Leone and Zambia.

41. Workshops and other forms of training included national workshops on nuclear law, organized in Malawi and in Nigeria, national or regional training courses for regulators on authorization and inspection of radiation sources in Botswana, Chile, Morocco and Seychelles, and a workshop on Nuclear Safety, Security and Safeguards in Turkmenistan.

42. Equipment to support regulatory activities for radiation safety and the security of radioactive sources was provided to Algeria, Botswana, Cameroon, Central African Republic, Côte d'Ivoire, Gabon, Lebanon, Madagascar, Mauritius, Namibia, Niger, Sierra Leone, Uzbekistan and Vietnam.

Improved Physical Protection

43. Overall, the Agency supported improvements to the security of nuclear and other radioactive material by assisting with upgrading or preparing to upgrade the physical protection at facilities and locations in 15 States housing radioactive material.

44. Work to help improve the physical protection of nuclear material at various nuclear facilities were performed in Algeria, the Democratic Republic of Congo, Ghana, Kazakhstan, Morocco, Serbia,

Tajikistan, Tunisia and Uzbekistan. Specific larger programmes were implemented, in close interaction with donor States, in Armenia and in Bulgaria. The Agency started a pilot project to install, for domestic purposes, remote monitoring equipment for physical protection at a nuclear facility in Slovenia.

45. Support to improve the physical protection of other radioactive material and associated facilities included work to upgrade physical protection systems in Algeria, Bahrain, Belarus and Serbia. The Agency interacted on a number of physical protection subjects with South Africa. In addition, the Agency initiated activities to improve physical protection of radioactive sources in Cameroon, Kenya, Nigeria, Sudan and Zambia.

Transport Security

46. Transport of nuclear and other radioactive material is inherent to the use of such material. Transport moves the material from a controlled environment into the public arena, to other operators, using a variety of communication routes, or to temporary storage, and can involve movement from one State to another. Maintaining a high level of security of the material during transport presents specific challenges.

47. For the purposes of the Implementing Guide entitled Security in the Transport of Radioactive Material, a transport security module has been developed for inclusion in nuclear security and safety advisory services upon request by States.

48. The Agency also has started work on a methodology for verifying the radioactive material content of shipments in transit, independent of data contained in related shipping, import/export and other authorizing documentation.

Recovery, Conditioning and Repatriation of Spent or Dangerous Radioactive Sources

49. Securing radioactive sources remains a global nuclear security priority. The Agency is working with States to secure disused sources and, upon request, helps to package, condition and send the sources back to the supplier or to transport them to a proper national radioactive waste storage facility. These are complex operations that often require the use of technically advanced, specialized facilities and States often lack the infrastructure and expertise to carry out these activities on their own.

50. The Agency has developed a mobile hot cell to for the purpose of recovering, handling and conditioning of spent high activity radioactive sources (SHARS) in States lacking the extensive infrastructure and technical expertise to carry out these activities on their own. SHARS operations are presently in the advanced preparation stage in Sudan and in the United Republic of Tanzania, and being planned in States in Latin America and South-East Asia.

51. As a result of concerted efforts by the Agency and some States to search for and secure orphan sources, a number of high activity vulnerable radioactive sources were discovered. During the period covered by this Report, more than 600 sources of various categories were packaged, conditioned and either sent back to the supplier or brought to safe and secure storage. Successful operations and/or planning missions were conducted in nine States: Argentina, Azerbaijan, Brazil, Cuba, Lebanon, Nigeria, Serbia, Sudan and the United Republic of Tanzania.

HEU Repatriation

52. HEU has been widely used as fuel and target for radioisotope production in research reactors. However, both un-irradiated and irradiated HEU material is proliferation sensitive. Efforts have been ongoing to assist States in repatriating to the supplier any HEU research reactor fuel presently not in use.

53. Supported by the United States Global Threat Reduction Initiative, through contracts arranged by the Agency, two shipments representing a total amount of 13.3 kg of fresh HEU fuel were returned from Poland and Vietnam to the Russian Federation. In addition, the Agency assisted in the shipment to the Russian Federation of 80 kg of spent HEU fuel and 280 kg of spent LEU fuel from the Czech Republic and 14.4 kg of spent HEU from Latvia.

Prevention Training

54. To strengthen States' capacities in the area of prevention, the Agency convened 14 national, 14 regional and two international training courses in the area of physical protection of nuclear material in use, storage and transport and associated facilities, including State systems of accounting for and control of nuclear material. More than 750 participants from 90 States were trained.

D.2.3. Future Priorities

55. Enhancing physical protection and improving regulatory infrastructures will continue to be one of the most important security objectives. In line with the Amendment to the CPPNM, every State should develop a Design Basis Threat (DBT), monitor its domestic threat and assess vulnerability for nuclear material used in or transported through its territory. Agency assistance to States to establish a DBT to assess and better understand their domestic threats will continue as high priority as will training of States' experts on physical protection concepts and designs. Continued high priority will also be given to physical protection upgrades at facilities.

56. The search for radioactive sources will continue to be a priority. For sources that are in use, proper security measures need to be in place in order to protect the radioactive material against unauthorized removal and to help reduce the likelihood of other malicious acts. For disused sources, the preferred option for risk reduction is to condition, package and repatriate the sources back to the country of origin. The other option is to condition the sources for long term storage in the State's waste storage facilities. Searching for, locating and identifying radioactive sources out of regulatory control will also continue to be a priority.

D.3. Detection and Response

D.3.1. Overall Objective

57. The overall objective of this activity is to enhance capabilities of States to detect, interdict and respond to illegal acts involving nuclear and other radioactive material and associated facilities. Another objective of this area is to develop and help implement internationally accepted guidance and technical information that will assist States in their efforts to build effective controls at major public events and other places and to respond to acts of terrorism at such events.

D.3.2. Major Achievements

IAEA Nuclear Security Series

58. A nuclear security handbook entitled Combating Illicit Trafficking in Nuclear and other Radioactive Material was published in February 2008. It contains technical and administrative measures to combat illicit nuclear trafficking.

Effective Border Controls

59. An effective detection architecture must be in place within a State, including support functions, as the basis for border control. Plans must be available for effective response measures to ensure that any detected or seized material is handled in a manner befitting the risk presented. Once seized, the

material must be processed properly and the individuals involved become subject to the due process of the law.

60. During the period covered by this Report, the Agency helped establish effective border monitoring capabilities in 19 States by providing over 260 items of equipment to improve detection and response capabilities.

61. The Agency also established the Border Monitoring Working Group (BMWG) to promote and coordinate multilateral and bilateral cooperation on establishing detection monitoring capabilities at borders. The activities include the coordination of the training of officers and the sharing of lecturers and training facilities, the development of joint training courses and syllabi and the standardization of monitoring equipment procurement specifications.

62. Work started on arrangements for central domestic monitoring of instrument readings at border crossings. Through such a remote reading arrangement, prompt support may be available when there is a need to determine the nature of the alarm.

Nuclear Security Equipment Laboratory

63. The Agency's Nuclear Security Equipment Laboratory (NSEL) helps to ensure that border detection instruments meet relevant technical and functional specifications. During the year covered by this Report, the NSEL conducted acceptance tests on 826 portable and two fixed installed radiation detection instruments and evaluated 31 new detection systems. It also helped convene 23 training courses and technical evaluation missions in Member States.

64. In 2007, the Agency was concerned about a 27% rejection rate of equipment tested by NSEL. A comprehensive strategy to improve the quality of procured equipment was developed and, as a result, the rate of rejection has been reduced to 5%.

Nuclear Security Support for Major Public Events

65. The organization of a major public event (MPE), such as a sports events or a high level political meeting presents unique security challenges. The Agency provided support with information, detection instruments, training of staff as well as knowledge and expertise in Peru and Brazil. Most recently, the Agency and the China Atomic Energy Authority signed a cooperation arrangement to, inter alia, assist with nuclear security for the 2008 Olympic Games. This assistance included assessment missions, nine training courses and field exercises and the supply or loan of over 200 pieces of detection instrumentation for the duration of the Games.

66. With respect to longer term activities, the Agency has had initial discussions on nuclear security for MPEs: with China (2010 Shanghai EXPO); South Africa (2010 Football World Cup); the United Kingdom (2012 Olympics); and Ukraine (2012 Eurocup).

Incident and Emergency Centre

67. The Incident and Emergency Centre (IEC) continued, over the year, to coordinate the emergency preparedness and response activities of the Agency and other international bodies. The cornerstones of international emergency activities are the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. Should a security-related event result in a transboundary release of radioactivity, the procedures to respond to such a situation would be applicable. The system developed is a globally unified system that will streamline the Agency's current reporting systems and will provide for a reliable and secure means of exchanging and sharing information and data for routine communications, exercises, notifications, alerts and responses to radiation events.

68. In 2007, the Agency conducted three Emergency Preparedness and Review Missions (EPREV), a service offered to appraise preparedness for radiation emergencies in Member States. In 2007, the Agency also bolstered the Response Assistance Network (RANET), established to render appropriate and timely assistance to a State affected by a radiation emergency. A Manual for First Responders to a Radiological Emergency was published in 2006. To improve the Manual's accessibility to Member States, a web browser based tool enabling more user-friendly access while in the field was also introduced. The Manual provides practical guidance for those who will respond during the first few hours to a radiological emergency and for national officials who would support this early response.

69. The IEC continued to support States' incident and radiological emergency response preparedness for the risk of theft, sabotage, unplanned seizure, or dispersion of radioactive material. In doing so, it addressed, inter alia, the challenges of emergencies resulting from sabotage to nuclear facilities or transports, which could result in the dispersal of radioactive material.

Research and Development

70. During the period covered by this Report, the Agency completed one Coordinated Research Project entitled Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and Other Radioactive Material. It resulted in 16 research contracts and 13 research agreements with institutions in 19 States. The CRP also resulted in the development of new instruments, methods and techniques for detection of unauthorized acts involving nuclear and other radioactive material. The outcome of these activities has been published in IAEA-TECDOC-CD-1596.

71. In addition, during the same period, the Agency started two new Coordinated Research Projects: Development and Implementation of Instruments and Methods for Detection of Unauthorized Acts Involving Nuclear and other Radioactive Material; and Application of Nuclear Forensics in Illicit Trafficking of Nuclear and other Radioactive Material.

72. These projects will result in improved instruments and methods for detection of unauthorized acts and the implementation of nuclear forensics by States.

Detection and Response Training

73. During the reporting period, 18 national, 13 regional and two international training courses were convened for more than 825 individuals from 95 States. These activities contributed to enhancing capabilities of States to detect, interdict and respond to illegal acts involving nuclear and other radioactive material and associated facilities.

D.3.3. Future priorities

74. Future priorities for detection and response include the completion of a comprehensive set of guidance for use at borders and for recovery of lost material domestically and to obtain an effective model for interaction among the various contributing national organizations for these purposes. High priority will be given to the development of architecture for effective border monitoring from a global perspective and a strategy on how to achieve its goals.

75. Priorities also include the establishment of sustainable measures for the development and commissioning of improved radiation detection instruments and, making available to all States, arrangements for nuclear forensics analysis of seized material and for its recovery when lost. Preparedness for basic response measures in case of release of radioactivity is a particular challenge for security related incidents since there is no geographic predetermination of where they may occur.

D.4. Towards a Coherent Human Resources Development Programme

D.4.1. Human Resources Development: Education and Training

76. In order to advance sustainable nuclear security, the Agency has developed a comprehensive overall strategy spanning from the shortest term types of training, such as *ad hoc* specialized training courses, to a programme that culminates in a Master of Science in Nuclear Security.

Training

77. Thus, training courses are designed at three levels: courses for an audience at the international level with staff in policy related positions and for those in leadership positions; courses to be given in a regional context, taking into account that States from the same region may share similar cultural background and experience; and courses designed for national workshops, dealing with topics that are suitable for discussion in a national environment, addressed to national organizations with different responsibilities in a security relevant situation.

78. From 1 July 2007 to 30 June 2008, the Agency organized over 65 training courses and workshops at the international, regional and national level relating to nuclear security. Forty States hosted training activities for more than 1600 participants from 120 States. The audience included policymakers, legislators, nuclear regulators, facility operators, customs officers, border security officers, national police officers, intelligence officers and emergency responders. A table of training activities for the period 1 January 2002–30 June 2008 can be found in document "Overview of the Agency's Nuclear Security Activities - 2008".

Graduate Education

79. The Agency, together with university academics and experts from Member States, is developing guidelines for an Educational Programme in Nuclear Security, including a Master of Science programme and a Certificate programme, both of which will serve as models for States in assisting them to develop such programmes nationally in the future.

Nuclear Security Support Centres

80. As an important step to provide for sustainability, the Agency has developed a conceptual approach for the establishment and maintenance of National Nuclear Security Support Centres. The aim of the centres is: to help bring about States' sustainable competencies in nuclear security; to enable States to improve their nuclear security regimes; and to foster more effective maintenance of these regimes through a systematic, business-oriented approach. The centres will serve as a focal point for sustainable and continued access to knowledge, skills and abilities by individuals involved in a State's contribution to global nuclear security.

E. Coordination Efforts

E.1. Cooperation with States

81. The Agency has continued to develop the INSSP as a workplan for and as tool to coordinate nuclear security support in a State. In December 2007 the Agency organized a meeting between donors and a State, based on that State's INSSP, to better bring together needs and resources. To facilitate the implementation of interaction in nuclear security and for specific projects, the Agency establishes a cooperation agreement with the individual States. During the reporting period, the

Agency established such cooperation agreements with Brazil, China, Pakistan, Peru, Qatar and Saudi Arabia. These arrangements facilitate programme implementation and predictability of work. Review of progress is made periodically together with an update of the work plan.

E.2. Cooperation with the European Union

82. The cooperation with the European Union continued in the framework of the implementation of the EU Strategy against Proliferation of Weapons of Mass Destruction. Within this framework, the EU has adopted a series of Joint Actions in support of the IAEA Nuclear Security Plan. These Joint Actions comprise substantial contributions to the NSF.

83. The implementation of the first Joint Action that was adopted in 2004 and targeted to States in , the Caucasus, Central Asia and South Eastern Europe regions was completed in October 2007. The implementation of the second and third Joint Actions, adopted in 2005 and 2006, respectively, is ongoing. The geographic scope of the second Joint Action was extended to Northern Africa and the Mediterranean region in the Middle East and of the third Joint Action to cover the whole of Africa.

84. On 14 April 2008, the European Union adopted a fourth Joint Action, extending the geographic scope further to South-east Asia. Projects under this Joint Action will be implemented in 2009 and 2010.

E.3. Cooperation with International Organizations

85. The Agency is the international organization with primary responsibilities in areas of relevance for nuclear security and having competence in the various technical subjects that contribute to nuclear security. It continued to work with other international organizations such as the International Civil Aviation Organization, the International Maritime Organization, the Organization for Security and Co-operation in Europe, the United Nations Interregional Crime and Justice Research Institute, the United Nations Office on Drugs and Crime, the World Customs Organization and others in various cooperative fields, including information sharing and, where appropriate, joint activities. These efforts are directed towards providing consistency and coherence in nuclear security activities worldwide for the purpose of avoiding any duplication of efforts and to further enhanced impact of existing resources.

86. In the future the Agency will continue to enhance its coordinating efforts with other relevant regional and international organizations and bilateral and multilateral initiatives in the area of nuclear security. In this regard, the Agency will also start working with the newly established World Institute of Nuclear Security (WINS).

United Nations Office on Drugs and Crime

87. The Agency has expanded its cooperation with the United Nations Office on Drugs and Crime (UNODC) by participating in several regional and sub-regional workshops organized by UNODC on the suppression of acts of nuclear terrorism, and by inviting UNODC to participate in Agency-sponsored workshops, seminars and training courses and in jointly developing model criminal provisions.

Interpol

88. During the reporting period, the Agency expanded its cooperation with Interpol within the respective mandates of the organizations. In addition to a continued exchange of information with Interpol for Project Geiger, an activity that focuses on collating and analysing information on illicit trafficking and other unauthorized activities involving nuclear and other radioactive material, the

Agency participated with Interpol in the preparation of a threat analysis relating to thefts of nuclear and radioactive material. The interaction also includes information collection and analytical activities and further development of joint analytical products to be disseminated to the Member States via the IAEA ITDB points of contact and to Interpol's national focal points.

United Nations Interregional Crime and Justice Research Institute

89. The Agency is also cooperating with the United Nations Interregional Crime and Justice Research Institute (UNICRI) in UNICRI's development of a pilot Chemical, Biological, Radiological and Nuclear (CBRN) knowledge management system that UNICRI is developing under European Commission sponsorship. The Agency provided UNICRI with information about the ITDB to allow UNICRI to use the ITDB procedures as a model for their anticipated collection of chemical and biological data.

United Nations Counter-Terrorism Implementation Task Force

90. The UN Secretary General established the UN Counter-Terrorism Task Force (CTITF) in July 2005 to ensure coordination and coherent efforts across the UN system to fight terrorism. On 8 September 2006, the UN General Assembly adopted the United Nations Global Counter-Terrorism Strategy, which 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 Agency continues to work with other entities to establish coordination modalities within the Agency's mandate, Board of Governors decisions, General Conference resolutions and financial rules and regulations and confidentiality obligations.

E.4. Other International Initiatives

Global Initiative to Combat Nuclear Terrorism

91. The Agency continues to recognize the value of the initiative in improving nuclear security. During the period covered by this Report, the Agency continued to participate as an observer and coordinated activities under the Nuclear Security Plan with those carried out under the Global Initiative to Combat Nuclear Terrorism (GICNT) and contributed to some of its activities with technical expertise and other requested support requested by participating States.

G8 Global Partnership

92. During the reporting period the Agency participated in meetings of the G8 Global Partnership and briefed participants on activities being carried out under the Agency's Nuclear Security Plan in order to better coordinate programmes.

F. Resources to Implement the Nuclear Security Plan

F.1. Overview

93. The implementation of the Nuclear Security Plan continues to be heavily dependent on extrabudgetary contributions from Member States and others to the Nuclear Security Fund (NSF).

94. In the period covered by this Report, pledges were made by the Czech Republic, Denmark, Finland, France, Japan, Spain, Sweden and the USA. Contributions were received from the Czech Republic, Denmark, the European Community, Finland, France, Ireland, Japan, the Republic of Korea, Pakistan, Qatar, Romania, Sweden and the USA. In addition to financial contributions, Member States continued to provide "in kind" contributions such as donations of equipment, cost free experts, the use of facilities and the hosting of meetings and training activities.

F.2. Constraints and Priorities

95. The lag between the time pledges are made and contributions are actually received affects the ability to draw meaningful single-year conclusions on the programmatic impact of restrictions on pledged funds. Conditions on the use of funds are a major determinant in setting programme priorities since the vast majority of donations are made with conditions that must be taken account of before any systematic programmatic prioritization activities can occur.

96. Overall, approximately 90% of the funds for the Nuclear Security Fund (NSF) were donated with conditions. These primarily include limitations on the geographic location in which funds can be used and/or the purposes to which the funds can be applied, as well as restrictions relating to procurements and human resources.

97. Considering that a significant portion of unrestricted donations must be used to cover salaries, it is difficult to implement any meaningful prioritization process. Nonetheless, the Agency has established a methodology to determine which States should be given priority in receiving support that takes account of objective factors such as the quantity and type of nuclear material used in a State, the presence and type of radioactive sources in a State, the status of the relevant legislation, and the technical and administrative nuclear security systems that are in place. It also takes into account the threat posed by the particular security situations or the *situs* of the material. Predictable and assured funding arrangements are necessary to permit long term planning arrangements required for a sustainable global nuclear security regime.

98. Table A shows NSF expenditures and disbursements for the period 2002 to the present. It reflects a substantial increase in disbursements in 2006 over 2005 that remained consistent through 2007. Indications are that disbursements will increase considerably in calendar year 2008, in accordance with increasing contributions.

Table A: NSF Expenditures and Disbursements

2002-2003	**disbursement**	**$5 746 043**
2004	**disbursement**	**$7 662 548**
2005	**disbursement**	**$ 8 828 591**
2006	**disbursement**	**$15 451 894**
2007	**disbursement**	**$15 712 282**
2008	**disbursements plus unliquidated obligations as of 21 July**	**$16 567 000**

G. Effective and Efficient Programme Implementation

G.1. Current Management Initiatives

99. The Agency's Electronic Programme Support System (EPSS) is an electronic management system that is designed to support and track the use of extrabudgetary funds, in particular the NSF. It is the repository of information concerning the work done to implement the Nuclear Security Plan and makes available financial and management information as needed.

100. The EPSS integrates its information with other Agency systems. In 2007, the system connected with the Agency programme and budget development system, in addition to the financial records and procurement system. It has also absorbed the functions of other existing systems and has become the state of the art vehicle for tracking extrabudgetary funds. Short term development will see the strengthening of a workflow function for better management overview and connection to a broader range of Agency systems.

G.2. Programme Evaluation

101. An evaluation of the Agency's nuclear security programme was undertaken by a panel of external experts established by the Agency's Office of Internal Oversight Services as part of the regular programme evaluation process. The evaluation took place from 27 November to 7 December 2007. The purpose of the evaluation was to determine: whether the Nuclear Security Plan 2006–2009 was effective in achieving its stated objectives; whether it had incorporated the necessary improvements from the 2002–2005 Plan; and whether sufficient consideration was being given to the future of the nuclear security programme beyond 2009.

102. The outcome of the evaluation was reported to the Board in document GOV/INF/2008/3. The Agency is now implementing the recommendations contained in the report.

G.3. Advisory Group on Nuclear Security

103. The Advisory Group on Nuclear Security (AdSec) was established by the Director General to advise him on the Agency's activities related to preventing, detecting and responding to terrorist or other malicious acts involving nuclear or other radioactive material, as well as to provide advice on establishing priorities and the implementation of ongoing activities. AdSec met twice during the reporting period and considered and made recommendations to the Director General.

G.4. Next Plan for IAEA Nuclear Security Activities

104. The Agency's Nuclear Security Plan for 2006–2009 emphasizes measures to establish and enhance the capabilities of States to prevent, interdict and respond to illegal acts involving nuclear and other radioactive material and their associated facilities. The follow-on to the present Plan will be developed and approved during 2009. The findings of the International Symposium of Nuclear Security, to be held in March 2009 will be particularly important in this process. Thorough consultations with Member States will take place before the Plan is submitted to the Board of Governors for approval in September 2009.