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# Nuclear Security Report 2012

*Report by the Director General*

## **Summary**

This report has been produced for the fifty-sixth regular session (2012) of the General Conference in response to resolution GC(55)/RES/10, in which the General Conference requested that the Director General submit an annual report on activities undertaken by the Agency in the area of nuclear security, highlighting significant accomplishments of the prior year and indicating programmatic goals and priorities for the year to come. This report covers the period 1 July 2011–30 June 2012.

## **Recommended Action**

It is recommended that the Board of Governors:

- a. Take note of the Nuclear Security Report 2012;
- b. Transmit this Report to the General Conference with a recommendation that Member States continue to contribute on a voluntary basis to the Nuclear Security Fund;
- c. Note that seven years after its adoption, the Amendment to the Convention on the Physical Protection of Nuclear Material has still not entered into force;
- d. Call upon States to adhere to the Amendment 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; invite States to make full use of the assistance available for this purpose through participation in the Agency's nuclear security programme;
- e. Encourage all States to participate in the Illicit Trafficking Database programme;

- f. Encourage those States that have yet to do so to nominate representatives to the Nuclear Security Guidance Committee and, by so doing, to contribute to the establishment of internationally agreed nuclear security guidance; and
- g. Encourage all States to participate in the IAEA International Conference on Nuclear Security: Enhancing Global Efforts, to be held in 2013.

# Nuclear Security Report 2012

*Report by the Director General*

## **A. Introduction**

1. This report has been produced for the fifty-sixth regular session (2012) of the General Conference in response to resolution GC(55)/RES/10, in which the General Conference requested that the Director General submit an annual report on activities undertaken by the Agency in the area of nuclear security, highlighting significant accomplishments of the prior year and indicating programmatic goals and priorities for the year to come. This report covers the period 1 July 2011–30 June 2012.

2. Recognizing that responsibility for nuclear security rests entirely with each State, the Agency continued to provide assistance, upon request, to States in their national efforts to establish effective and sustainable nuclear security systems. During the reporting period, the Agency continued to assist States' efforts to build and develop their nuclear security capacity by: providing nuclear security guidance; facilitating adherence to and implementation of the international legal instruments relevant for nuclear security, including facilitating the entry into force of the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM); and helping States to establish comprehensive national nuclear security infrastructure. All activities were undertaken with due regard to the protection of confidential information.

3. The March 2012 meeting of the Board of Governors marked the tenth anniversary of enhanced Agency activities in nuclear security. The outcome of Agency efforts over that ten year period is set out in a brochure entitled IAEA Nuclear Security: Achievements 2002 – 2011<sup>1</sup>. Further information on the Agency's goals and priorities for 2011/2012 was set out in paragraph 68 of the Nuclear Security Report 2011<sup>2</sup>. The Agency took action in the course of the reporting period to implement all the goals and priorities set out in that report, fully implementing five of the eight, with work on the remaining three at an advanced stage of completion.

## **B. The International Legal Framework**

4. As noted in the Nuclear Security Report 2011, adherence to the international legal instruments relevant to nuclear security continues to increase, albeit at a relatively slow pace. No State became a

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<sup>1</sup><http://www.iaea.org/Publications/Booklets/NuclearSecurity/nsachievements0312.pdf>

<sup>2</sup>GOV/2011/51-GC(55)/21.

party to the CPPNM<sup>3</sup> during the period covered by this report, although seven States ratified the 2005 Amendment to the CPPNM<sup>4</sup>, bringing the number of Contracting States to 56. At the time of issue of this report, ratification by an additional 41 States was still required for the Amendment to enter into force<sup>5</sup>. The importance of the entry into force of this Amendment has been highlighted in a number of fora and the slow pace of progress has been noted as being a matter of concern.

5. The Code of Conduct on the Safety and Security of Radioactive Sources is a non-binding international legal instrument that provides guidance for ensuring the control of radioactive sources and for mitigating/minimizing any consequences should control measures fail. Also legally non-binding, the supplementary Guidance on the Import and Export of Radioactive Sources was developed in 2004 to support States' implementation of the Code. A revised version of the Guidance was approved by the Board of Governors on 12 September 2011 and was subsequently endorsed by the 55<sup>th</sup> General Conference. As of 30 June 2012, 112 States had informed the Agency's Director General of their intention to implement the Code of Conduct, and 74 States of their intention to implement the supplementary Guidance<sup>6</sup>.

6. The International Convention for the Suppression of Acts of Nuclear Terrorism gained two adherents during the reporting period, bringing the number of States Parties to 79 as of 30 June 2012.

7. The Agency continued to facilitate adherence to and implementation of international instruments, not only through its regular activities within its legislative assistance programme, but also by holding a Treaty Event during the 55<sup>th</sup> General Conference aimed at promoting universal adherence to the relevant multilateral treaties for which the Agency is depositary, including those relating to nuclear security, and by taking part in a number of initiatives launched by Member States such as the High-Level Regional Workshop on the International Legal Framework for Nuclear Security, held in Indonesia in July 2011.

8. In response to numerous Member States' statements, and in the light of General Conference Resolution GC(55)/RES/10, about the need to make further efforts in working towards entry into force of the 2005 Amendment to the CPPNM, the Agency has planned additional activities to foster information exchange to facilitate States' adherence to the Amendment. Planned activities include the organization of four regional workshops in the second half of 2012, aimed at increasing awareness about both technical and legal requirements under the Amendment; provision of a forum for States Parties to the CPPNM to exchange views and information on the adoption and implementation of the Amendment; and discussions with States Parties on the way forward, including the effective and active use of Agency assistance available to States.

## **C. Major Meetings and Coordination**

### ***Major IAEA Meetings***

9. The Agency held a first programme committee meeting in March 2012 to prepare for the IAEA International Conference on Nuclear Security: Enhancing Global Efforts, which will take place from 1

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<sup>3</sup>[http://www.iaea.org/Publications/Documents/Conventions/cppnm\\_status.pdf](http://www.iaea.org/Publications/Documents/Conventions/cppnm_status.pdf)

<sup>4</sup>[http://www.iaea.org/Publications/Documents/Conventions/cppnm\\_amend\\_status.pdf](http://www.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf)

<sup>5</sup>The Amendment will enter into force once it has been ratified by two-thirds of the States Parties to the CPPNM.

<sup>6</sup>[http://www.iaea.org/Publications/Documents/Treaties/codeconduct\\_status.pdf](http://www.iaea.org/Publications/Documents/Treaties/codeconduct_status.pdf)

to 5 July 2013. Details of the conference are available on the IAEA website<sup>7</sup>. Representatives from a number of Member States and relevant international organizations participated in the programme committee meeting.

10. The IAEA International Conference on the Safety and Security of Transport of Radioactive Material: The Next Fifty Years of Transport – Creating a Safe, Secure and Sustainable Framework, was held in Vienna in October 2011. 258 participants from 60 Member States and 11 organizations attended the Conference. The President's findings from this conference are available on the IAEA website<sup>8</sup>.

### ***Other Relevant Meetings***

11. The Director General attended as an observer the 2012 Seoul Nuclear Security Summit, which took place from 26 to 27 March 2012 in Seoul, Republic of Korea. Heads of state and government discussed the security of nuclear materials and radioactive sources. Strong support was expressed at the summit for the central role of the Agency in nuclear security.

### ***Cooperation and Coordination***

12. GC(55)/RES/10 encouraged the Secretariat to continue, in coordination with Member States, to play a constructive and coordinated role in nuclear security related initiatives. In fulfillment of the resolution, the Agency continued to hold working-level discussions with international as well as regional organizations and initiatives involved in nuclear security, through the convening of information exchange meetings. All information exchanges were undertaken by the Agency in strict conformity with its confidentiality regime.

13. The Agency held two such meetings in February and May 2012 that brought together more than ten relevant organizations. At the meetings, participants concluded that improvements had been made in many areas, such as more systematic and active exchange of information through, for example, the creation of dedicated pages on the Agency's Nuclear Security Information Portal (NUSEC), more active and frequent participation in each other's activities and the identification and elimination of any duplication of effort.

14. The Border Monitoring Working Group (BMWG), established by the Agency, has met regularly since 2006 to coordinate the activities of the Secretariat, the United States of America and the European Union in the areas of provision of financial support, technical assistance, human resource development and policy development relating to the detection of materials out of regulatory control. During the reporting period, the BMWG met twice, from 19 to 20 November in Santa Fe, New Mexico, USA and from 19 to 20 June in Vienna. Joint training activities of the BMWG included training for trainers on radiation detection techniques for Arabic speaking States, hosted by the European Commission's Joint Research Centre in Ispra, Italy in February 2012, two further training events at the centre and a workshop on Nuclear Security Measures at International Airports, hosted by Greece in March 2012. In addition, joint assessment missions were conducted in Central and South East Asia aimed at ensuring common approaches and practices to assistance provided throughout the region.

15. In addition to their participation in information exchange meetings, the International Criminal Police Organization (INTERPOL) received expert support from the Agency including for its 2011

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<sup>7</sup><http://www-pub.iaea.org/iaecameetings/43046/International-Conference-on-Nuclear-Security-Enhancing-Global-Efforts>

<sup>8</sup><http://www-ns.iaea.org/meetings/rw-summaries/trans-vienna-2011.asp>

Global Radiological and Nuclear Terrorism Prevention Conference and its 2012 Radiological and Nuclear Trafficking and Terrorism Analysis Conference. This support further helped to bridge the gap between nuclear scientists and law enforcement, crime and security analysts engaged in combatting illicit trafficking. The Agency gave presentations on a range of topics including global trends and threats based on the Illicit Trafficking Database (ITDB) and fostered information sharing among experts in the nuclear security field. Similar cooperation and exchanges continued with the European Police Office (EUROPOL) and the Police Community of the Americas (AMERIPOL).

16. The Agency initiated efforts to better coordinate its activities as foreseen in the Nuclear Security Plan 2010-2013 with other international assistance being provided under Member States' programmes relating to nuclear security. As part of these efforts, a draft set of working procedures for the International Radioactive Sources Working Group has been developed and discussed with representatives of Member States. The first working group meeting, open to all Member States, aimed at promoting the coordination of assistance for the security of radioactive sources will be held by the Agency in December 2012.

17. In February 2012, the Agency hosted a topical meeting on the security of nuclear and other radioactive material during transport. The meeting, attended by a number of Permanent Mission representatives and technical experts, provided a forum to better acquaint States' representatives with the potential threats posed by the misuse of radioactive sources, the activities of various States to reduce the likelihood of such misuse and the activities of the Agency aimed at supporting States' efforts to secure radioactive sources.

18. The Agency participated in the third Regional Review Meeting of the Radiological Security Partnerships on Radioactive Source Security held in the Philippines from 18 to 20 January 2012. A total of 46 representatives from 15 States and international organizations participated in the meeting. The objectives were to identify challenges and progress in States' efforts to implement the basic principles relating to security set out in the Code of Conduct on the Safety and Security of Radioactive Sources and to discuss potential solutions to guide States' efforts on a regional level. Thailand offered to host the fourth regional review meeting, which will be held in late 2013.

19. The Agency participated in relevant Global Initiative to Combat Nuclear Terrorism (GICNT) events during the period covered by this report. States taking part in the GICNT agreed to transmit two GICNT documents to the Agency to serve as input for the drafting of Agency publications in the IAEA Nuclear Security Series. The Agency expects that this approach will serve as a model for future collaboration in the preparation of Nuclear Security Series publications to help avoid duplication of effort and enhance the harmonization of guidance to States.

20. The outcome of these activities has been positive. Informal information exchange has improved and collaboration has been enhanced. Further improvements are expected through the introduction of new software for the NUSEC portal, which will facilitate the establishment of a common calendar of events.

## **D. Major Achievements**

21. The following summarizes the major achievements for each element of the Nuclear Security Plan 2010-2013.

## **D.1. Needs Assessment, Information Collation and Analysis**

### **D.1.1. Illicit Trafficking Database Programme**

22. During the period between 1 July 2011 and 30 June 2012, two States joined the Agency's Illicit Trafficking Database (ITDB) programme, bringing the total number of participants to 114.

23. By the end of the reporting period, States had reported — or otherwise confirmed to the ITDB programme — a total of 2242 incidents since the database began in 1995. During the reporting period, States reported 163 incidents to the ITDB, 19 of which involved illegal possession of and attempts to sell nuclear material<sup>9</sup> or radioactive sources, with 11 of these involving nuclear material. There were 28 cases of theft or loss of radioactive sources reported, five of which involved the theft of Category 1 to 3 radioactive sources<sup>10</sup>. In three of the five incidents, the radioactive sources have not been reported as being recovered.

24. The remaining 116 incidents involved unauthorized activities without apparent relation to criminal activities. These included the detection of nuclear material or radioactive sources disposed of in unauthorized ways, the detection of radioactively contaminated material, the recovery of radioactive material outside of regulatory control and the discovery of nuclear material or radioactive sources in unauthorized or undeclared storage. Of these 116 incidents, two involved small quantities of highly enriched uranium (HEU). The two reports of incidents involving HEU indicate the continuing availability of such material outside of regulatory control.

### **D.1.2. Illicit Trafficking Information Outreach**

25. In order to discuss ways in which the reporting of incidents, analytical processes and database architecture could be improved, a meeting was held in Vienna in July 2011 with a small group of points of contact of the ITDB. Proposals and ideas arising from this meeting will be presented at a meeting of all points of contact scheduled for July 2012. The meeting will discuss proposals for streamlining reporting procedures, especially by means of electronic submission of reports through the NUSEC portal, as well as the identification of analytical products and agreement on implementing systematic follow-up of past incidents for which information provided is not complete.

### **D.1.3. Information Tools**

26. The Secretariat has acquired advanced software tools to enhance its analytical capacities in support of the Nuclear Security Plan's objective of establishing a comprehensive platform for nuclear security information<sup>11</sup>. The selected tools will be employed in improving the processing and analysis of continually increasing volumes of nuclear security information, including that derived from open sources.

### **D.1.4. Integrated Nuclear Security Support Plans**

27. The Agency has accelerated the development of Integrated Nuclear Security Support Plans (INSSPs), which consolidate the nuclear security needs of individual States into integrated plans for nuclear security assistance as well as provide customized frameworks for coordinating and

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<sup>9</sup>Nuclear material means special fissionable material or source material, as defined in Article XX of the Statute of the Agency.

<sup>10</sup>See IAEA Safety Standards Series No. RS-G-1.9, *Categorization of Radioactive Sources*.

<sup>11</sup>See paragraph 23 of GOV/2011/51-GC(55)/21.

implementing nuclear security activities conducted by the States concerned, the Agency and potential donors. Each INSSP is a confidential document that remains the property of the State concerned.

28. Thirteen States approved their INSSPs, bringing the total number approved to 38, with seven finalized INSSPs awaiting formal approval. In cooperation with the relevant State authorities, the Agency has drafted an additional 21 INSSPs, which are at various stages of finalization.

29. In implementing or planning activities in each of the States covered by INSSPs, efforts were also made to review regularly the progress of the implementation and to incorporate future activities. In this connection, during the reporting period, five INSSPs were reviewed and brought up to date.

30. From 6 to 8 June 2012, the Agency convened a topical meeting to increase Member States' awareness of the importance of INSSPs. The meeting, attended by a range of policy makers and technical experts from 52 States, served as a forum for sharing the experience and lessons learned from the development and implementation of such plans in various States. During the meeting, the value of INSSPs was recognized and a number of States expressed strong interest in developing their own INSSP, which will be discussed further at a bilateral level. As an outcome of this meeting, concrete steps to be taken were agreed with more than 20 States to develop their INSSPs.

#### **D.1.5. Nuclear Security Information Portal**

31. The Agency has continued to develop the NUSEC portal mentioned in previous reports. Web pages on nuclear forensics and cyber security were developed at the start of 2012 and, as of 30 June 2012, the NUSEC portal had over 650 registered users from nearly 70 States and 16 international institutions.

#### **D.1.6. Nuclear Security Information Management System**

32. The Agency is developing a system called the Nuclear Security Information Management System (NUSIMS), which is intended to provide Member States with a secure self-assessment mechanism or tool to help identify their needs and with possible assistance in relation to their national nuclear security regime. The information contained within NUSIMS will also assist in the preparation of INSSPs, provide real-time information on how issues identified in the INSSP are being addressed, and contribute to the prioritization of future activities under the Nuclear Security Plan. A pilot version of NUSIMS is expected to be finished by the end of 2012, with implementation planned for 2013.

### **D.2. Enhancing the Global Nuclear Security Framework**

#### **D.2.1. Nuclear Security Guidance Committee**

33. At the March 2012 meeting of Board of Governors, the Director General announced that he had decided to establish the Nuclear Security Guidance Committee (NSGC) as a standing body of senior experts in the area of nuclear security, open to all Member States. The purpose of the NSGC is to make recommendations to the Deputy Director General, Head of the Department of Nuclear Safety and Security, on the development and review of IAEA Nuclear Security Series publications. The objective is to contribute to greater transparency, consensus, quality, coherence and consistency of both technical and policy content by engaging more Member States in the development of international publications for nuclear security.

34. The first meeting of the NSGC was held in Vienna from 12 to 14 June 2012, with 53 participants from 40 Member States attending. At this first meeting, the NSGC discussed its terms of reference, agreed on the process to be followed in future for the development and review of IAEA Nuclear Security Series publications, selected its members for the interface group (which will advise on the

review and approval of proposed publications that have safety–security interfaces) and approved the draft Nuclear Security Fundamentals publication *Objective and Essential Elements of a State’s Nuclear Security Regime*. This draft publication will be submitted, as recommended by the NSGC, to the September meeting of the Board of Governors for endorsement.

### **D.2.2. IAEA Nuclear Security Series**

35. During the reporting period, two publications were issued in the IAEA Nuclear Security Series, namely *Computer Security at Nuclear Facilities*, IAEA Nuclear Security Series No. 17, and *Nuclear Security Systems and Measures for Major Public Events*, IAEA Nuclear Security Series No. 18. A further publication, *Identification of Vital Areas at Nuclear Facilities*, is in the final stages of preparation and will be issued shortly as IAEA Nuclear Security Series No. 16.

36. Implementing Guides on the following subjects are in preparation:

- Use of nuclear material accounting and control for nuclear security at facilities;
- Nuclear forensics in support of investigations;
- Nuclear security detection architecture;
- Establishing the nuclear security infrastructure for a nuclear power programme;
- Nuclear security in transport of nuclear material;
- Detection of and response to radioactive materials out of regulatory control at points of entry and exit;
- Implementing the legal and regulatory framework for nuclear security: nuclear and radioactive material out of regulatory control.

37. The Agency has carried out a needs based analysis in order to prioritize the development of some 30 ‘lower tier’ draft publications in the IAEA Nuclear Security Series. Details of this needs analysis will be presented at the second NSGC meeting in December 2012.

38. The Agency has made significant efforts to translate and publish documents in the IAEA Nuclear Security Series in all official languages of the Agency. However the Agency would welcome further support from Member States to complete the translation of all publications in the series into all official languages.

### **D.2.3. Research and Development to Support Effective Nuclear Security**

39. A Coordinated Research Project (CRP) on Development of Methodologies for Risk Assessment and State Management of Nuclear Security Regime was completed. The final report is being prepared in the form of working material for use by Member States and for comment on its outcomes, usefulness and applicability. This report provides a technical basis for the further development and use of security assessment methodologies for nuclear fuel cycle facilities, facilities using radioactive sources and the transport of nuclear and other radioactive material. As recommended by the CRP, the Agency has initiated a new CRP on nuclear security assessment methodologies. This CRP aims to develop performance based methodologies to assess nuclear security in a more systematic and structured manner.

40. The Agency has also initiated a CRP on the identification of high confidence nuclear forensics signatures for the development of national nuclear forensics libraries. This research is focused on identifying key forensics signatures at each stage in the nuclear fuel cycle for inclusion in States’ national nuclear forensics libraries.

41. Coordinated Research Projects on the development and implementation of instruments and methods for the detection of nuclear and other radioactive material and on the application of nuclear forensics in illicit trafficking of nuclear and other radioactive material were finalized. The final reports of these CRPs are expected to be issued in 2013.

### **D.3. Nuclear Security Services**

#### **D.3.1. Development and Use of Design Basis Threat**

42. The Agency continued to assist States in the establishment of formal threat assessment and a design basis threat, which is essential to the design and evaluation of nuclear security systems and measures. Five national workshops on the development, use and maintenance of a design basis threat were held between July 2011 and June 2012. As of 30 June 2012, the Agency has conducted a total of 49 workshops in this area.

#### **D.3.2. Nuclear Security Evaluation Missions**

##### *International Nuclear Security Advisory Service*

43. Upon request, the Agency offers peer reviews and advisory services to evaluate the effectiveness of nuclear security systems and measures in States through missions comprising experts from Member States. During the reporting period, the assessment criteria of the International Nuclear Security Advisory Service (INSServ) were revised into a modular format, thereby allowing States to select modules depending on their needs.

44. Three official requests for INSServ missions were received from Belarus, Kenya and Romania, and six Member States have indicated an interest in undertaking an INSServ in the foreseeable future.

##### *International Physical Protection Advisory Service*

45. The Agency also provides, on request, an International Physical Protection Advisory Service (IPPAS), to focus on a State's nuclear security infrastructure associated with nuclear facilities and associated activities, as well as that for facilities and activities involving radioactive material, including transport of nuclear and other radioactive material.

46. The Agency is updating the IPPAS guidelines in order to ensure that the service represents best current practices. This update includes the development of new modules, including a module on cyber security.

47. In the course of the reporting period, the Agency conducted IPPAS missions to France and the United Kingdom and follow-up missions to Finland and the Netherlands. As of 30 June 2012, the Agency had conducted a total of 55 IPPAS missions in 37 Member States, including 14 follow-up IPPAS missions to 13 Member States.

48. A number of States have asked the Agency to provide detailed information on IPPAS services. In order to meet these requests, the Agency will hold IPPAS workshops with interested States, the first of which will take place in Australia and China in 2012.

49. The recognition of IPPAS Missions has steadily increased as demonstrated, inter alia, by a report issued by the European Union Ad Hoc Group on Nuclear Security, issued on 31 May 2012, which "highly encourage[s] the use of IPPAS Missions on a regular basis in all EU Member States with NPPs". The Agency is organizing an international seminar on IPPAS experience and lessons learned from the last 16 years. This international event will be hosted by France in 2013.

### ***Technical Missions***

50. Specific technical missions are also offered to the Member States in the area of border monitoring to define, together with Member State authorities, high-priority tasks aimed at enhancing national nuclear security infrastructures in the area of detection and response. During the reporting period, three technical missions on border monitoring were undertaken in Colombia, Cuba and Uruguay. The results of these missions provide a solid basis and a roadmap for implementation of effective and sustainable border monitoring projects.

51. The Agency conducted two missions to Libya to support the strengthening of its national nuclear security infrastructure, during which participants visited the main facilities and their physical protection systems at the Tajoura Nuclear Research Centre (TNRC), the Tripoli Medical Centre and the uranium ore concentrate storage location at Sabha. As a result of the missions and discussions held, a framework for future cooperation was agreed that is being incorporated into an INSSP for Libya, containing high-priority needs and practical steps to address them. Certain physical protection activities were agreed to be implemented immediately and before the conclusion of the INSSP. Cooperation with major donors to implement Libya's future INSSP has already started.

### **D.3.3. Nuclear Security Training**

52. In the period covered by the report, the Agency provided nuclear security training to more than 1750 people, representing an increase of 6% over last year. Of the 70 nuclear security training courses and workshops that took place, 41 were in the area of prevention and computer security, and 29 in the area of detection and response. Hosted by 35 different States, nine of these events were conducted for international audiences, 19 for regional audiences and 42 for national audiences.

53. The training courses delivered by the Agency during the reporting period covered a wide variety of topics, including threat management and assessment, physical protection of nuclear material and facilities, nuclear material accounting and control relevant to nuclear security at facilities, security of radioactive sources, transport security, nuclear security culture, nuclear forensics, radiological crime scene management, and radiation detection techniques. In some instances, training courses were conducted as part of programmes of assistance for major public events.

54. The Agency continued to deliver hands-on training courses using the new training facilities available at the Institute for Global Safety and Security of MEPHI (former Interdepartmental Special Training Centre) in Obninsk, Russian Federation. Three courses for specialists on the practical operation and inspection of physical protection systems, including a pre-diploma practical training course on physical protection for university students, were conducted for an international audience.

55. An effort towards better modularization of existing training programmes and a systematic review of proposed curricula in the light of recently issued publications in the IAEA Nuclear Security Series was initiated through several consultancy meetings. This led, for example, to the development of a specific training package for the development of mobile expert support capacities and for the training of team leaders.

### **D.3.4. International Network for Nuclear Security Training and Support Centres**

56. In July 2011 the Agency held a meeting of interested parties to discuss issues relating to the establishment of a network of national Nuclear Security Support Centres (NSSCs) or centres of excellence. This initiative was well received by participants and a further meeting was held between 31 January and 2 February 2012, attended by 47 participants from 30 Member States and relevant international organizations. The outcome of this meeting was an agreement to establish a network called the International Network for Nuclear Security Training and Support Centres. The network is

expected to enhance nuclear security capacity building capabilities worldwide, and is supported by three working groups.

57. The Agency is assisting States that wish to establish NSSCs or centres of excellence. At the same time, the European Union is working to develop a number of regional centres of excellence for the chemical, biological, radiological and nuclear areas (EU CBRN Centres of Excellence). The Agency and the EU are working together to avoid any duplication of effort for activities relating to the radiological and nuclear components of the CBRN centres. A cornerstone of this cooperation is the development and implementation of joint education and training courses.

### **D.3.5. Nuclear Security Education**

58. The Agency is continuing to provide support to develop global nuclear security education primarily through the working groups of the International Nuclear Security Education Network (INSEN), which held its second annual meeting from 8 to 9 August 2011. The meeting attracted 50 participants from 21 Member States, together with representatives from international organizations.

59. In order to address the need for adequate educational materials in the area of nuclear security, INSEN has concentrated its efforts on developing the first academic textbook dedicated to nuclear security. This textbook is based on the module NS1 Introduction to Nuclear Security set out in IAEA Nuclear Security Series No. 12, *Educational Programme in Nuclear Security* and provides a broad overview of nuclear security. The textbook is currently at the final stage of review.

60. INSEN members have also developed two academic textbooks in Russian language of relevance to nuclear security, on nuclear energy, nuclear fuel cycle and nuclear applications; and on methods and instruments for nuclear and other radioactive material measurements.

61. In addition, peer reviewed teaching material comprising an indicative agenda, PowerPoint presentations and related session plans, practical and laboratory exercises as well as evaluation exercises have been developed for the six academic courses set out in IAEA Nuclear Security Series No. 12. A group of universities in Austria, Germany, the Netherlands, Norway and the United Kingdom will launch the first comprehensive master's degree programme in nuclear security in the first quarter of 2013, using the material produced by INSEN.

62. In order to help institutions better deliver the aforementioned material, a pilot professional development course for faculty members was held at King's College London, United Kingdom, in September 2011 and in January 2012. Thirteen professors from 11 States participated. Due to the significant interest in these courses, a second professional development course was held in April 2012. A further professional development course on IT security and cyber security has been launched by Brandenburg University, Germany, for which workshops will be held in June and September 2012.

## **D.4. Risk Reduction**

### **D.4.1. Physical Protection Upgrades**

63. The Agency has engaged in the upgrading of 50 sites housing high activity sources in six States, and has completed a security upgrade of a radioactive waste disposal facility in another State through the provision of substantial infrastructure improvements, bringing the site into line with Agency guidance and recommendations for the physical protection of facilities.

### **D.4.2. Remote Monitoring**

64. States' use of remote monitoring systems at facilities housing nuclear or other radioactive material enables the early detection of violations of the physical protection of such facilities and the

timely implementation of off-site response measures. The Agency has provided assistance in maintaining previously installed systems. In addition, during the reporting period, the Agency installed two further remote monitoring systems, bringing the total number of such installations worldwide to 21.

#### **D.4.3. Nuclear Security for Nuclear Fuel Cycle Facilities and Associated Activities**

65. The Agency is developing a programme for the enhancement of nuclear security at specific fuel cycle facilities, such as nuclear power plants, nuclear research reactors, uranium production and nuclear fuel fabrication facilities, as well as specific facilities at the back end of the fuel cycle. This programme will address important nuclear security related issues such as regulatory and institutional capabilities, security by design, security management, physical protection of facilities and materials, and sustainability of security programmes. To achieve the programme objectives, the Agency is developing additional nuclear security guidance and self-evaluation methodologies and a new training curriculum and materials, as well as conducting other related activities, such as advisory service missions and CRPs.

66. In addition, the Agency is developing a more comprehensive approach to nuclear security culture. This approach to nuclear security culture will cover nuclear fuel cycle facilities and associated activities, including transport of nuclear and other radioactive material, and radioactive sources. This activity focuses on the practical implementation of the guidance set out in IAEA Nuclear Security Series No. 7 on *Nuclear Security Culture*. During the reporting period, the Agency organized three nuclear security workshops, in Indonesia, Finland and Pakistan. The Agency also participated in a workshop entitled In Search of Sustainable CBRN Security Culture organized by the Centre for International Trade and Security at the University of Georgia, USA, in February 2012.

67. The Agency has initiated activities for assisting States in enhancing nuclear security in connection with activities relating to the processing of uranium ore. Issues to be addressed include the legal and regulatory framework, threat assessment, security management, security culture, physical protection systems and nuclear material accounting and control relevant to nuclear security. As part of these activities, the Agency undertook a thorough review of all relevant activities in Kazakhstan.

68. The Agency is developing a comprehensive set of guidance and assistance tools for nuclear security at research reactors. In May 2012, the Agency finalized preparations for a pilot regional training course on the security of research reactors, which will take place in October 2012 in Indonesia for Member States in Asia and the Pacific Region.

#### **D.4.4. Nuclear Material Accounting and Control Relevant to Nuclear Security at Facilities**

69. The Agency has initiated activities to assist States to implement nuclear material accounting and control methodologies and practices relevant to nuclear security at the facility level. As part of this work, the Agency is also updating its training package on insider threats.

#### **D.4.5. Securing Radioactive Sources**

70. Between July 2011 and June 2012, the Agency secured two Category 1 and 2 radioactive sources from two States. One source was returned to the country of origin, while the other was exported to another country for recycling.

71. The Agency increased its activities to support States' efforts to improve the security of radioactive sources and associated facilities inter alia through the development of new draft guidance publications and the provision of training.

#### **D.4.6. HEU Repatriation**

72. At the request of Member States, the Agency has continued to be involved in the repatriation of high enriched uranium (HEU) research reactor fuel. Within the framework of the Russian Research Reactor Fuel Return Programme, the Agency assisted in the return to the Russian Federation of nearly 110 kg of fresh HEU fuel from the Kharkov Institute, Ukraine and of approximately 20 kg of HEU spent fuel from the Kiev Institute, Ukraine after the core conversion of the research reactor from HEU to low enriched uranium (LEU) fuel. These two operations formed the second phase of HEU fuel removal in accordance with the Ukrainian Government's announcement, in April 2010, that it would remove half of the HEU from the country by the end of 2010 and the remainder by the end of 2012.

#### **D.4.7. Establishing Effective Border Control**

73. On the basis of the draft Implementing Guide on nuclear security detection architecture, a course aimed at raising awareness on this topic has been developed for senior managers responsible for the national policy, strategy, planning, design, implementation and evaluation of nuclear security detection architecture. The course enables participants to perform self-assessments for determining their capabilities and limitations and to define needs for an effective nuclear security detection architecture and can be delivered at both national and regional levels.

74. As part of the support to States in the area of nuclear security, the Agency maintains an equipment pool comprising high resolution spectrometry systems, mobile detection systems (backpacks), radioisotope identification devices, neutron search devices and personal radiation devices. This equipment pool is used for training activities as well as for loan to Member States as part of the integrated assistance package associated with holding a major public event.

75. During the reporting period, the Agency donated 237 handheld and other nuclear security instruments of various types to Member States. Since July 2011 the Agency has assisted in installing one radiation portal monitor in Indonesia, two in Malaysia and eight in Vietnam. A border monitoring upgrade project with Cuba is in the early stages of implementation.

76. Donated equipment is first checked by the Agency's Nuclear Security Team (NST). The NST also undertakes performance testing of all the equipment supplied to Member States that are building their nuclear security capabilities under agreed INSSPs. In addition to the instruments in the equipment pool, the NST undertook performance tests for high resolution spectrometry systems, mobile detection systems (backpacks), radioisotope identification devices, neutron search devices and personal radiation devices during the reporting period.

#### **D.4.8. Major Public Events**

77. The Agency continued to work closely with States holding major public events in the implementation of nuclear security systems before and during the event. Such assistance is normally provided under a joint action plan that covers: technical support missions; training courses, seminars, and exercises; drafting of procedures for detection and response to criminal and other unauthorized acts involving nuclear and other radioactive material out of regulatory control; information exchange and analysis for combating threats; selection, deployment and operation of detection equipment; and response to nuclear security events including emergency response. In the period covered by this report, the Agency has provided assistance to the following Member States:

- Colombia: support for the nuclear security of the FIFA U-20 World Cup, including the loan of radiation detection equipment.

- Equatorial Guinea and Gabon: support for the nuclear security of the African Cup of Nations, including a technical assessment mission, training of venue security staff and the loan of radiation detection equipment.
- Mexico: assistance with nuclear security of the major public events associated with the October 2011 XVI Pan American Games, including an assessment mission, training courses, a field exercise, the loan of radiation detection equipment and the provision of relevant information about illicit trafficking cases. In the preparation for the G20 Summit in 2012, assistance covered further strengthening the capacity building of ordnance response experts.
- Poland and Ukraine: support for the nuclear security of the UEFA European Football Championship, including a technical mission, several nuclear security training events, a field exercise and the loan of radiation detection equipment.

78. Initial discussions with the Government of Brazil have been held to establish a plan for cooperation on nuclear security between the National Nuclear Energy Commission (CNEN) and the Agency, from 2013 to 2016, for a number of forthcoming major public events that will be hosted by Brazil.

79. The Government of Zimbabwe has requested nuclear security assistance for the General Assembly of the UN World Tourism Organization, to be held in August 2014. The Agency has extended an offer of assistance to Zambia, which will co-host that event.

#### **D.4.9. Radiological Crime Scene Management**

80. Law enforcement operations in States may involve instances in which radioactive material is found at, and seized from, crime scenes. Lessons learned from such events highlight the need for procedures to alert relevant national authorities and to identify clearly the roles and responsibilities associated with a response to a nuclear security event, in order both to best protect the public and responders, as well as to preserve the integrity of potential criminal evidence. Through preparedness as well as procedures for the implementation of a concept of operations, law enforcement and nuclear science capabilities can be optimally positioned to support a complex response involving radioactive material as criminal evidence. To assist States, the Agency is preparing an Implementing Guide on this subject. Consultancy meetings were held in 2011 and 2012, with further work this year involving the international law enforcement organizations. An open ended Technical Meeting is planned for September 2012.

81. The Agency is also developing the curriculum for a training course on radiological crime scene management on the basis of the aforementioned draft Implementing Guide. The training course aims to acquaint participants with the issues that will likely arise in the course a criminal investigation involving nuclear and other radioactive material and to enable them to handle such situations in an efficient and effective manner.

82. The Agency conducted a regional workshop, in Canberra, Australia, on radiological crime scenes and nuclear forensics in March 2012. Feedback from the regional participants in this course has been used in developing the Agency's draft guidance on radiological crime scene management.

#### **D.4.10. Nuclear Forensics**

83. The Agency convened a topical meeting on nuclear forensics in October 2011 to increase awareness and understanding of nuclear forensics and of the technical support available from the Agency. The Agency is developing guidance for States on establishing a national nuclear forensics library to ensure the security of nuclear and other radioactive material. Outreach materials and draft

implementing guidance for the States were prepared at several consultancy meetings held in 2011 and 2012.

84. The Agency revised its training curriculum in nuclear forensics in 2012 to include a general course on introduction to nuclear forensics as well as an applied course on nuclear forensics methodologies. The introductory course is based on IAEA Nuclear Security Series No. 2 on *Nuclear Forensics Support* and was held in Japan in May 2012 for Member States in Asia and the Pacific region. In partnership with the US National Nuclear Security Administration, the Agency held a methodology course at Pacific Northwest National Laboratory, USA, from 26 February to 6 March 2012 for 24 practitioners from 12 Member States. A team of internationally recognized experts provided hands-on instruction in nuclear forensic analysis and interpretation using state of the art laboratories housed at this facility.

85. The Agency also convened a consultancy meeting in Japan in January 2012 to identify core capabilities in nuclear forensics, including national frameworks, evidence management, material analysis and interpretation, and human capital. As noted above, a new CRP on the identification of high confidence nuclear forensics signatures for the development of national nuclear forensics libraries was approved in 2011 and is expected to run from 2012 to 2015. The Agency worked with the GICNT's Nuclear Forensics Working Group in the development of a statement on nuclear forensics fundamentals that was finalized in 2012. These fundamentals will be used as an input for future publications in the IAEA Nuclear Security Series.

86. The Agency is promoting a network of approximately a dozen international nuclear forensics laboratories. The goal is to increase membership of this network to all interested Member States. This network allows its members access to leading forensics experts and state of the art analytical facilities when investigating crimes. In the reporting period, the Agency signed an agreement with the Netherlands Forensic Institute (NFI) to bring their decades of experience in traditional forensic expertise to assist the Agency in developing best practices in radiological crime scene management, nuclear forensics and cyber forensics applied to nuclear security. The development of nuclear forensics guidance that arises from the expertise contained within this network of laboratories, as well as the traditional forensics aspects provided by the NFI, will greatly benefit States wishing to develop expertise in this area of nuclear security.

## **E. Management Issues**

### **E.1. Funding**

87. Expenditure in the period 1 January 2012 to 30 June 2012 was €9.1 million. This expenditure comprised disbursements (€3.1 million) plus liquidated obligations (€6.0 million)<sup>12</sup>. Although increases in the regular budget have facilitated programme implementation, the Agency continues to rely on extra budgetary contributions to the Nuclear Security Fund, which provides approximately 80% of overall expenditure in Agency nuclear security activities. Such a high reliance on extrabudgetary funding increases the problems of programme management and impacts on planning and prioritization of activities.

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<sup>12</sup> Liquidated obligations represented financial engagements involving claims against resources for which expenditure authority has been given and not yet paid.

88. In the course of the year, contributions to the Nuclear Security Fund were pledged by Belgium, Canada, China, the European Commission, Germany, Estonia, Finland, France, Italy, Japan, Netherlands, New Zealand, Norway, the Russian Federation, the Republic of Korea, Spain, Sweden, the United Kingdom and the United States of America.

89. For the future, in light of the recognized importance of effective nuclear security and growing demands for assistance it will be necessary to explore ways and means to strengthen the Agency's work in this area.

## **E.2. AdSec**

90. The Advisory Group on Nuclear Security (AdSec) met twice in the course of the reporting period, and continued its core work of advising the Director General on priorities for and implementation of the Agency's nuclear security programme. The results of a two-year study by the Joint AdSec-Commission on Safety Standards (CSS) Task Force were presented to a joint meeting of AdSec and the CSS held on 1 November 2011. The report of the Joint Task Force was endorsed by both groups and was submitted to the Director General.

91. Further consideration is being given to the role and functions of AdSec in the light of the Director General's decision to establish the NSGC. The specific role that AdSec has played to date in relation to the development and review of Agency nuclear security guidance will be undertaken by NSGC, with AdSec fulfilling a general advisory role.

## **F. Goals and Priorities for 2012/2013**

92. The main nuclear security programmatic goals and priorities for the year to come are:

- To present to the September 2013 meeting of the Board of Governors a new Nuclear Security Plan covering the years 2014 – 2017. The plan will be drawn up in consultation with Member States.
- To organize the International Conference on Nuclear Security in July 2013 to bring together senior government officials, representatives from relevant international organizations and other stakeholders to consider measures for further improving global nuclear security.
- To present at the December 2012 meeting of the Nuclear Security Guidance Committee a comprehensive programme for the development of IAEA Nuclear Security Series publications covering all remaining areas of prevention, detection and response.
- To enhance and further develop the International Network for Nuclear Security Training and Support Centres, in order to support States wishing to establish such centres, and the International Nuclear Security Education Network.
- To seek to extend membership of the collaborative network of nuclear forensics laboratories to all interested Member States and to promote cooperation between all international nuclear forensics constituencies.
- To continue to develop Integrated Nuclear Security Support Plans, at the request of States, and to organize further events sharing information on their development and implementation, as appropriate.

- To enhance outreach activities relating to the International Physical Protection Advisory Service to assist interested States in meeting the recommendations set out in INFCIRC/225/Revision 5 (IAEA Nuclear Security Series No. 13 on *Nuclear Security Recommendations on Physical Protection on Nuclear Material and Nuclear Facilities*).
- To further facilitate the entry into force of the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material through the delivery of regional workshops and the provision of any requested assistance to Member States.
- To explore ways and means to strengthen Agency activities related to Nuclear Security.