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Nuclear Security Report 2017

Report by the Director General

Summary

This report has been produced for the sixty-first regular session (2017) of the General Conference in response to resolution GC(60)/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, and on external users of the Incident and Trafficking Database (ITDB) and on past and planned activities of educational, training and collaborative networks, as well as highlighting significant accomplishments of the previous year within the framework of the Nuclear Security Plan and indicating programmatic goals and priorities for the year to come. This report covers the period 1 July 2016–30 June 2017.

Recommended Action

It is recommended that the Board of Governors take note of the Nuclear Security Report 2017.

Nuclear Security Report 2017

Report by the Director General

A. Introduction

1. This report has been produced for the sixty-first regular session of the General Conference in response to resolution GC(60)/RES/10. In operative paragraph 43 of that resolution, the General Conference requested the Director General to submit an annual report to the General Conference on activities undertaken by the Agency in the area of nuclear security, and on external users of the Incident and Trafficking Database (ITDB) and on past and planned activities of educational, training and collaborative networks, as well as highlighting significant accomplishments of the previous year within the framework of the Nuclear Security Plan and indicating programmatic goals. This report covers the period 1 July 2016–30 June 2017.

2. Responsibility for nuclear security rests entirely within a State. The Agency continued to provide assistance, upon request, to States in their national efforts to establish and maintain effective and sustainable nuclear security regimes. During the reporting period, the Agency continued to implement activities under the Nuclear Security Plan 2014–2017, approved by the Board of Governors in September 2013. All activities were undertaken with due regard to the protection of confidential information.

B. The International Legal Framework

B.1. Legally Binding Instruments

3. Member States have recognized physical protection as a key element of nuclear security. A goal and priority for 2016–2017 as set out in operative paragraph 9 of the Nuclear Security Resolution 2016[1] was to promote further adherence to the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM) with the aim of its universalization. During the reporting period, six States became party to the Amendment. The Agency conducted an expert mission to Uganda in May 2017 to raise awareness of the importance of the Amendment amongst senior leaders in the country.

[1] GC(60)/RES/10

4. A meeting of representatives of States Parties to the CPPNM and the Amendment was held in Vienna in November–December 2016. The purpose of the meeting was to discuss matters within the scope of the CPPNM and the Amendment, with particular emphasis on improving mechanisms for information sharing and promoting universalization of the Amendment. States were provided with a better understanding of the legal implications of the entry into force of the Amendment, and were able to exchange their national experiences regarding the implementation of the CPPNM and its Amendment.

5. The International Convention for the Suppression of Acts of Nuclear Terrorism gained six States Parties during the reporting period, bringing the total number to 110 as at 30 June 2017.

B.2. Non-Binding Instruments

6. As of 30 June 2017, 134 States, including 3 States in the reporting period, have made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 107, including 3 States in the reporting period, have also notified the Director General of their intention to act in a harmonized manner in accordance with the Code's supplementary Guidance on the Import and Export of Radioactive Sources.

B.3. Regulatory Framework

7. Recognizing the need of many Member States for support in the development of regulations for nuclear security, the Agency launched a specific project dedicated to enhancing the national regulatory frameworks for nuclear security in African States. An introductory workshop was hosted by Morocco in April 2017 and was attended by 75 participants from 36 African States. A second workshop was hosted by Niger in May 2017 and was attended by 22 participants from 13 African States. The objective of the project is to assist States in the development and drafting of regulations to support national nuclear security regimes.

C. Major Meetings and Coordination

8. The Agency hosted two Information Exchange Meetings in Vienna in November 2016 and in April 2017 to coordinate activities in nuclear security and avoid duplication in the activities undertaken by various relevant organisations. Participants from 11 organizations and initiatives such as the Global Initiative to Combat Nuclear Terrorism and the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction exchanged information, discussed various themes within nuclear security, and reached a better understanding of activities being undertaken by each organization. The International Conference on Nuclear Security: Commitments and Actions was convened at Agency Headquarters in Vienna in December 2016. The report of the Conference is set out in document GOV/INF/2017/10-GC(61)/INF/6.

9. The sixth meeting of the Working Group on Radioactive Source Security took place in Vienna in April 2017 and was attended by 97 participants from 69 Member States and 2 observer organizations. Participants discussed national efforts to establish and strengthen regulatory frameworks. This included the development of security-specific regulations as well as processes required to ensure the security of radioactive sources including inspection and authorization.

10. An Open-ended Meeting of Legal and Technical Experts on the Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources was held in Vienna from 27 to 29 June 2017 to exchange information and experience on the financial provisions established by

Member States to manage radioactive sources at all life cycle stages, including once they become disused. The meeting was attended by 180 participants from 101 Member States and three observers.

11. The Agency held the second International Seminar to Share Experience and Best Practices from Conducting International Physical Protection Advisory Service Missions in the United Kingdom in November 2016, in collaboration with the Government of the United Kingdom of Great Britain and Northern Ireland. The purpose of the seminar was to share the lessons learned and to discuss the benefits received from the conduct of International Physical Protection Advisory Service (IPPAS) missions and their follow-up activities, as well as the options for further enhancement of this service. The seminar was attended by 87 representatives from 36 Member States. The seminar also marked the 20th anniversary of the conduct of the first IPPAS mission in 1996. Implementation of the recommendations provided by the participants will help to enhance this service and to make it more beneficial to Member States that host an IPPAS mission.

D. Major Achievements

D.1. Needs Assessment, Information and Cybersecurity

D.1.1. Incident and Trafficking[2] Database (ITDB)

12. In the period between the inception of the ITDB and 30 June 2017, States had reported — or otherwise confirmed to the ITDB — a total of 3138 incidents. Reports of 162 incidents were added to the database in the reporting period. Of these incidents, 115 occurred between 1 July 2016 and 30 June 2017. While the Agency does not have the ability to verify States' reports, the number of incidents reported to the ITDB demonstrates that illicit trafficking, thefts, losses and other unauthorized activities and events involving nuclear and other radioactive material continue to occur.

13. Of the 162 newly reported incidents, 4 were related to trafficking, 2 related to attempted malicious use and 1 was a scam. All of the material involved in these incidents was seized by the relevant competent authorities within the reporting State. No incident involved high enriched uranium, plutonium or category 1 sources.

14. There were 30 reported incidents in which the intent to conduct trafficking or malicious use could not be determined. These included 13 thefts and 17 incidents of missing materials. In 19 incidents the materials were not recovered including 1 incident relating to category 2 and 3 radioactive sources.

15. There were also 125 reported incidents in which the material was out of regulatory control but not related to trafficking, malicious use or scams. Most of these incidents involved unauthorized disposal, unauthorized shipments and unexpected discoveries of material such as previously lost radioactive sources.

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[2] For the purpose of this report "trafficking" means "any intentional unauthorized movement or trade of nuclear or other radioactive material, in particular, those with possible or proven criminal intent". This definition was agreed upon at the triennial meeting of the points of contact to the ITDB, held in Vienna in July 2015, attended by representatives of 89 States. The definition is for ITDB communication purposes only, and should be read together with its supplementary information as available in the ITDB conceptual framework on the Nuclear Security Information Portal. The definition is not intended, under any circumstances, to place any obligations upon a State that may conflict with its own national definition of trafficking of nuclear and other radioactive material.

16. External users of the ITDB include the United Nations, the United Nations Office for Disarmament Affairs, the United Nations Office on Drugs and Crime, the United Nations Economic Commission for Europe, the International Civil Aviation Organization, the International Maritime Organization, the International Rail Transport Committee, the International Criminal Police Organization (INTERPOL), the Organisation for Co-operation between Railways, the Universal Postal Union, the World Customs Organization, the Police Community of the Americas, the European Commission (EC) including the Institute for Transuranium Elements of the EC's Joint Research Centre, the European Atomic Energy Community, the European Police Office (Europol), and the Organization for Security and Co-operation in Europe. As stated in the ITDB Terms of Reference, these external users only receive "unrestricted information" reported in Part I (and not in Part II) of the ITDB incident notification form.

D.1.2 Information Outreach for the ITDB

17. During the reporting period, efforts to provide information to States on incident notifications and membership in the ITDB included the following regional and national workshops and consultancy meetings:

- Subregional meeting for Northern European States, Vienna, Austria (September 2016);
- International meeting for States in the Black Sea and Caspian Sea area, Vienna, Austria (October 2016);
- Subregional meeting for Central and Southern African States, Arusha, United Republic of Tanzania (November 2016).

D.1.3 Information Tools and Analysis

18. During the reporting period the ITDB programme provided analytical reports and additional information services, in response to requests from Member States, in support of seven major public events. Further details of the events are set out elsewhere in this report.

19. The ITDB programme also provided analytical support in the development and implementation of Integrated Nuclear Security Support Plans for nine Member States.

D.1.4 Integrated Nuclear Security Support Plans

20. The Agency continues to give high priority to the development and implementation of Integrated Nuclear Security Support Plans (INSSPs) to assist States, upon request, in applying a systematic and comprehensive approach to nuclear security capacity building, and enable increased coordination between the Agency, the State concerned and potential donors to ensure appropriate allocation of resources and to avoid duplication of efforts.

21. An INSSP template is used as the basic framework for INSSPs. In response to Member State requests and in order to ensure that it remains current, the Secretariat reviewed and updated the template. The new template framework has been finalized and all INSSPs will be moved over to the new template as part of the normal INSSP review and finalization cycle. The update reflects the most recent nuclear security guidance developments and evolutions in the Agency's nuclear security assistance approaches; clarifies the relationship between the INSSP process and the Nuclear Security Information Management System (NUSIMS) self-evaluation tool; and applies a graded approach to actions Member States are recommended to undertake to strengthen their nuclear security regime. Use of the new template began in April 2017 and will be used for all new and reviewed INSSPs.

22. Five Member States formally approved their INSSPs, bringing the number of approved INSSPs to 77. As of 30 June 2017, 21 INSSPs were awaiting Member State acceptance and 3 INSSPs were awaiting finalization with the respective Member States. In the course of the year, the Agency held 12 INSSP review meetings and 6 INSSP finalization meetings.

23. The Agency held three regional workshops during the reporting period to enhance cooperation with States in developing and implementing their country-specific INSSPs and to enhance coordination between States with similar needs and priorities and explore regional solutions. The workshops brought together States in the Southern African Development Community, the Economic Community of West African States, and Asian countries. The workshops were held in March 2017 in Gaborone, Botswana, in November 2016 in Ouagadougou, Burkina Faso, and in October 2016 in Hanoi, Viet Nam.

D.1.5 Nuclear Security Information Portal

24. The Agency continued to maintain and improve the Nuclear Security Information Portal (NUSEC) to provide a comprehensive information tool to meet the needs of Member States and exchange information across the nuclear security community. The web-based NUSEC has 4020 registered users from 166 Member States and 17 organizations. This is a 20% increase in registered users in the past year, which improves the Agency's capability to reach the wider international security community with information on developments in the field of nuclear security. Improvements made to NUSEC in the reporting period include the development of an IPPAS Good Practice Database, an International Network for Nuclear Security Training and Support Centres (NSSC Network) database, and a common calendar to provide information on all training courses and other events hosted by NSSC Network members.

D.1.6 Nuclear Security Information Management System

25. The Agency continued maintenance of NUSIMS, a web-based platform for States to perform nuclear security self-assessments on a voluntary basis.

26. During the reporting period, 7 Member States nominated points of contact for NUSIMS, bringing the total number to 95. In addition, NUSIMS questionnaires are systematically used in INSSP finalization and review meetings, in order to support identification and prioritization of States' nuclear security needs, as well as to facilitate the use of NUSIMS to support the INSSP process. The Agency conducted INSSP meetings in Africa, Latin America, Europe and Asia using NUSIMS as a tool to orient INSSP discussions. These meetings also aimed to increase awareness of NUSIMS and to facilitate its use by Member States.

D.1.7 Information and Computer Security

27. Member States have encouraged the Agency to continue its efforts to strengthen computer security. In response, the Agency continued development of computer security guidance within the IAEA Nuclear Security Series. This included seeking comments from Member States on the proposed Implementing Guide provisionally entitled *Computer Security for Nuclear Facilities*. The proposed Technical Guidance provisionally entitled *Computer Security Techniques for Nuclear Facilities* was approved by the Nuclear Security Guidance Committee (NSGC) in June 2017 for submission to Member States for comment.

28. In addition, the Agency developed a new computer security training course on implementing computer security for instrumentation and control (I&C) systems that are representative of digitally controlled systems at nuclear facilities. The Agency held a Regional Training Course in Brazil in April

2017, the Republic of Korea in August 2016 and an International Training Course in the United Kingdom, in October 2016.

29. The Agency conducted expert meetings in Vienna to promote information exchange and share lessons learned on computer security in the supply chain in February 2017, on computer security regulation in May 2017, and on engineering and design aspects of computer security in instrumentation and control systems for nuclear power plants in May 2017 in the United Kingdom.

D.2. Supporting the Nuclear Security Framework Globally

D.2.1. Nuclear Security Guidance Committee

30. The Nuclear Security Guidance Committee (NSGC) met twice in Vienna, in November 2016 and June 2017. The Committee approved five guides for publication in the IAEA Nuclear Security Series (NSS), six draft publications for submission to Member States for comment and one proposal for a new publication. An NSGC working group also developed initial recommendations for updating the roadmap on the future development of Nuclear Security Series publications, and the NSGC discussed these recommendations.

31. The guides approved for publication during the reporting period included revised versions of two Implementing Guides on the security of radioactive material (Nuclear Security Series Nos 9 and 11). The other new guides approved for publication were an Implementing Guide on preventive measures for material out of regulatory control, and Technical Guidance on enhancing nuclear security culture in organizations and on planning and organization of nuclear security systems and measures for material out of regulatory control.

32. Two draft Implementing Guides have completed the 120-day Member States' comment period, and Member States' comments are being incorporated before submission of the final drafts to the NSGC for approval. These Implementing Guides address computer security for nuclear security and security during the lifetime of a nuclear facility.

33. By 30 June 2017, there were 26 current publications in the Nuclear Security Series, a further 7 approved for publication, and 23 others (including 7 revisions of existing Nuclear Security Series publications) at various stages of development, in accordance with the roadmap agreed with the NSGC.

D.2.2. Guidance related to the Code of Conduct on the Safety and Security of Radioactive Sources

34. In March 2017, the Director General submitted a report to the Board of Governors entitled *Code of Conduct on the Safety and Security of Radioactive Sources: Guidance on the Management of Disused Radioactive Sources* (GOV/2017/4). This report contained draft Guidance on the Management of Disused Radioactive Sources and the report of the Chairman of the 2016 Open-ended Meeting of Legal and Technical Experts to Develop Internationally Harmonized Guidance for Implementing the Recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources in Relation to the Management of Disused Radioactive Sources.

D.2.3. Advisory Group on Nuclear Security

35. The Advisory Group on Nuclear Security (AdSec) met in Vienna in October 2016 and in April 2017. AdSec provided comments to the Director General on drafts of the Nuclear Security Plan for 2018–2021 both at the initial and first-draft stages, focusing on providing its views on priorities for the coming four years. Two AdSec members attended the International Nuclear Safety Group

(INSAG) in May 2017 to initiate discussions to identify any possible topics for cooperative work between AdSec and INSAG. AdSec also initiated work on projects focusing on advising the Director General on emerging technologies.

D.3. Coordinated Research Projects

36. The Agency implements coordinated research projects (CRPs) under the Nuclear Security Plan to promote research and development to support nuclear security. Details of all CRPs implemented under the Nuclear Security Plan can be found on the NUSEC portal and the Agency's website[3].

37. During the reporting period, the following CRPs were at various stages of development:

- **J02004 Development of Nuclear Security Assessment Methodologies (NUSAM) for Regulated Facilities.** This CRP was initiated in 2013 and had four working groups, which completed their main objectives and have documented their results. The CRP used a structured, comprehensive and appropriately transparent process to establish a risk-informed, performance-based methodological framework. The CRP compared the results of simple pathway analysis tools, complex modelling and simulation tools, and table top exercise methodologies.

- **J02005 Improved Assessment of Initial Alarms from Radiation Detection Instruments.** This CRP is under way with over 20 States participating in the development of tools and technical documents to improve the decision-making process for determining whether an alarm is innocent or suspicious i.e. may contain nuclear or other radioactive materials out of regulatory control. The tools will help ensure effective and efficient assessment of radiation alarms and also reduce training needs for front line officers operating detection systems. The first tool to be developed under this CRP was publicly released for use on 7 June 2017. The Tool for Radiation Alarm and Commodity Evaluation (TRACE) is a freely distributed smartphone app and is the first of its kind. By the end of the reporting period, the app had been downloaded 630 times.

- **J02006 Nuclear Security for Research Reactors and Associated Facilities.** This CRP was initiated in 2015 and a total of eight research contracts and agreements were approved. Research began in 2016. This CRP will enhance the effectiveness of nuclear security programmes at research reactors and related facilities to reduce the risk of theft of nuclear and/or other radioactive material and sabotage. The CRP will also simplify the process for assessing this risk.

- **J02007 Development of Nuclear Security Culture Enhancement Solutions.** This CRP was launched in September 2015 to address the need for practical methodologies, tools and experience as well as knowledge-sharing of approaches to support the application of the nuclear security culture concept in practice. Ten participating institutions are conducting research and developing a database of nuclear security events in order to identify ways to further strengthen nuclear security culture.

- **J02008 Enhancing Computer Security Incident Analysis at Nuclear Facilities.** This CRP, initiated in 2016, conducts activities which support improved computer security capabilities at nuclear facilities to support the prevention and detection of, and response to, computer security incidents that have the potential to either directly or indirectly adversely affect nuclear safety and nuclear security.

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[3] https://cra.iaea.org/cra/explore-crps/all-active-by-programme.html

- **J02009 Enhancing Security in Transport of Nuclear and Other Radioactive Material.** This CRP will identify and evaluate technologies that can be applied to strengthen the security of nuclear and other radioactive material during transport.

D.4. Self-Assessment and Assessment through Peer Review Missions

D.4.1. International Physical Protection Advisory Service (IPPAS)

38. Since 1996, 76 IPPAS missions have been conducted, upon request, in 47 Member States. During the reporting period, IPPAS missions were conducted in Hungary in June 2017, Sweden in October 2016 and the United Arab Emirates in October 2016. The Agency received requests from Australia, China, the Democratic Republic of Congo, France, Germany, Jamaica, Lithuania, Madagascar, Switzerland and Turkey for IPPAS missions to be conducted in 2017–2018.

39. The Agency held four national IPPAS workshops in Belarus, the Democratic Republic of Congo, Germany and Nigeria to provide information on the processes for preparing and conducting IPPAS missions and on the benefits of such missions.

40. The Agency held a side event, “International Physical Protection Advisory Service — 20 years of Achievement”, on the margin of the International Conference on Nuclear Security: Commitments and Actions, where the Agency briefed delegates on what had been achieved by the service and some Member States shared their experience.

D.4.2. International Nuclear Security Advisory Service (INSServ)

41. The Agency is currently drafting guidelines for INSServ missions. These will be primarily addressed to team members of INSServ missions and to Member States that are considering hosting a mission.

D.5. Human Resources Development

D.5.1. Nuclear Security Training

42. In the reporting period, 2111 participants from 134 States took part in 107 training activities, and 1079 users from 122 States completed 2772 e-learning modules.

43. The Agency, in cooperation with the United States of America, continued to conduct an advanced three-week International Training Course on the Physical Protection of Nuclear Material and Nuclear Facilities. This course is available to Member States that have nuclear facilities in operation, under construction or under decommissioning. The course was conducted from 23 October to 11 November 2016 at Sandia National Laboratories in the United States of America. The course was attended by 38 participants from 27 Member States. Since its introduction in 1978, this course has been attended by over 800 participants from 73 Member States.

44. The Agency, in cooperation with the Russian Federation, conducted four training courses, namely an International Training Course on the Practical Operation of Physical Protection Systems at Nuclear Facilities in September 2016, an International Training Course for Newcomer Countries on Nuclear Security Systems and Measures for the Implementation of a National Nuclear Power Programme in October 2016, a Regional Training Course on Nuclear Security in Practice: Field Training for University Students in October 2016 and a Regional Training Course on Radiation Detection Techniques for Front Line Officers: Verification of Declared Shipments in November 2016.

45. The Agency revised two training courses on protection against sabotage of regulated facilities and on the implementation of IAEA Nuclear Security Series No. 13, *Nuclear Security*

Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5).

46. The Agency developed a three-dimensional (3D) model of a hypothetical facility. The model allows participants attending training courses related to the security of facilities to see the location of materials, which protection measures are currently in place, and how additional measures might improve security against insiders by allowing users to move around the facility as though they were workers or visitors. The 3D model will become an integral part of training courses.

47. In order to make training more readily available, the Agency has devoted additional resources to the development of further e-learning courses. During the reporting period, the Agency made an additional ten comprehensive e-learning courses available:

- Introduction to and Overview of IAEA Nuclear Security Series Publications
- Radiation Basics and Consequences of Exposure to Radiation
- Categorization of Radioactive Material
- Introduction to Radioactive Sources and Their Applications
- Use and Maintenance of Portable HPGe Gamma-Ray Spectrometer
- Overview of Nuclear Security Threats and Risks
- Nuclear Security Threats and Risks: Material and Facilities
- Nuclear Security Threats and Risks: Material Out of Regulatory Control
- Nuclear Security Threats and Risks: Cyberthreats
- Preventive and Protective Measures Against Insider Threats.

48. To assist States in better identifying their human resource development needs and to promote the systematic approach to training (SAT), the Agency conducted five workshops on training needs analysis in which 125 participants from 58 States took part. A new training programme — fully employing SAT methodology — for front line officer instructors was developed and successfully piloted in cooperation with the Governments of Malaysia and the United States of America in May 2017.

D.5.2. Nuclear Security Education

49. The International Nuclear Security Education Network (INSEN) continues to assist its member institutions and States in establishing and enhancing educational programmes on nuclear security based on international guidance and recommendations. The Network now has 163 institutions from 59 Member States. During the reporting period, INSEN members developed five packages of teaching materials and one textbook on several topics in nuclear security. Over 80 per cent of members offer modules, courses or degree programmes in nuclear security, using largely INSEN-developed teaching materials. Over 300 faculty members participated in faculty development courses to enable them to teach nuclear security at their institutions. INSEN collaborates with the International Network for Nuclear Security Training and Support Centres (NSSC) and its members to promote human resource development good practices, as well as to share information, expertise and resources.

50. Following an agreement between the IAEA and University of National and World Economy in 2014 in Bulgaria, the Agency has assisted the University in the implementation of a master's programme in nuclear security based on *Educational Programme in Nuclear Security* (IAEA Nuclear Security Series No. 12). The Agency has provided fellowships to 14 students from developing Member States, 7 of whom graduated in June 2017.

51. The seventh joint International School on Nuclear Security took place at the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy, from 27 March to 7 April 2017, with 41 participants from 40 Member States attending. To meet the high demand for the School, regional

equivalents are offered by the Agency on a regular basis. In 2016, two such Schools were implemented: the Regional School on Nuclear Security for Asia and the Pacific in Indonesia in October 2016 attended by 36 participants from 13 Member States, and, for the first time, the International School on Nuclear Security for Arabic-speaking Member States in Egypt in July 2016 attended by 33 participants from 14 Member States.

52. IAEA Nuclear Security Series No. 12, *Educational Programme in Nuclear Security*, was revised to reflect latest guidance and recommendations as well as feedback from INSEN, and was approved by the NSGC in June 2017 to submit to Member States for comment.

D.5.3. Nuclear Security Training and Support Centres

53. The Agency continues to respond to State requests for assistance with development of national Nuclear Security Training and Support Centres (NSSCs) as a means to strengthen the sustainability of nuclear security through programmes in human resource development, technical support and scientific support for the prevention and detection of and the response to nuclear security events.

54. The NSSC Network facilitates sharing of information and resources to promote coordination and collaboration among States with an NSSC or those having an interest in developing such a centre. The Network has grown since its inception in 2012 and now has representatives from 58 Member States. Over the past year, the Agency and NSSC Network members have undertaken several activities to strengthen the NSSC Network, including the deployment of new network information management tools on NUSEC and guidance on the establishment and operation of an NSSC.

D.6. Risk Reduction and Security Improvement

D.6.1. Threat Characterization and Assessment

55. The Agency continued advising States on threat characterization and assessment, the development, use and maintenance of design basis threats (DBTs) or alternative threat statements, vulnerability analysis and the development of methodologies for performance assessment of physical protection systems. The Agency delivered six national DBT workshops: in Armenia in September 2016, Bulgaria in October 2016, the Democratic Republic of Congo in July 2016, Norway in February 2017, Paraguay in May 2017, and Tajikistan in November 2016.

56. Member States have asked the Agency to provide advice on preventive and protective measures against insider threats. The Agency held one regional training course in Japan in February–March 2017 and one national training course in Armenia in September 2016 on the subject.

57. IAEA Nuclear Security Series No. 10, *Development, Use and Maintenance of the Design Basis Threat*, was published in 2009 prior to the publication of Nuclear Security Fundamentals NSS No. 20 and the Recommendations-level publications NSS Nos 13, 14 and 15. As such, and taking account of the requests from Member States, it was agreed to review and revise the publication to include cybersecurity threats, develop and clarify further the threat assessment and DBT development methodology including guidance on facility and activity specific DBTs, and include potential insider support.

D.6.2. Nuclear Security Culture in Practice

58. The Agency conducted two seminars for senior managers in Malaysia in November 2016 and March 2017, and one awareness-raising event in Jordan in March 2017.

59. The Agency accelerated its efforts to enhance understanding of nuclear security culture and its application in practice through one international workshop in China in September 2016 and four national workshops in Bosnia and Herzegovina in December 2016, in Egypt in November 2016, in Jordan in March 2017, and in Malaysia in March 2017.

60. The Agency has been engaged in supporting a nuclear security culture self-assessment trial at two medical facilities in Malaysia. The Agency also organized three national workshops in Member States who have expressed an interest in using the self-assessment methodology to make them aware of the process that they have to follow to carry out the self-assessment in Kazakhstan in February-March 2017, in Slovakia in April 2017, and in South Africa in May 2017.

D.6.3. Nuclear Security for Nuclear Fuel Cycle Facilities and Associated Activities

61. The uranium ore concentrate (UOC) project has continued to assist Member States through training courses that are based on the Agency publication entitled *Nuclear Security in the Uranium Extraction Industry*, published in February 2016. The courses focus on implementing prudent management practices to protect, control and manage UOC in processing, storage and transport. The Agency conducted two national training courses in August 2016 in the Niger and in Nigeria and one regional training course in Kazakhstan in November 2016.

62. The Agency completed a draft of the revised technical guidance provisionally entitled *Handbook on the Design of Physical Protection Systems for Nuclear Material and Nuclear Facilities* (NST055). This revised publication will replace the *Handbook on the physical protection of nuclear material and facilities* (IAEA-TECDOC-1276) published in 2002. The revised technical guidance was approved by the NSGC in June 2017 for submission to Member States for comment.

63. At the request of the Member States concerned, the Agency continued to assist with physical protection upgrades in Egypt and Pakistan.

D.6.4. Nuclear Material Accountancy and Control Relevant to Nuclear Security at Facilities

64. A new training course was developed and piloted in Morocco in October 2016 and Pakistan in November–December 2016 on the Technical Guidance publication entitled *Establishing a System for Control of Nuclear Material for Nuclear Security Purposes at Facility during Storage, Use, and Movement*. The training courses raised awareness in the Member States on how to apply accounting and control measures primarily for the purpose of detecting and deterring unauthorized removal of nuclear material.

D.6.5. Nuclear Security of Radioactive Materials and Associated Facilities

65. The Agency continued its efforts to support States through the development of guidance, training, and expert and technical support.

66. Training courses on radioactive source security were held in Cuba (June 2017), Kenya (August 2016), Lithuania (October 2016), Malta (November 2016), Mexico (November 2016), Saudi Arabia (February 2017) and Senegal (July 2017). The Agency also developed specific training for addressing insider threats to radioactive material and associated facilities.

67. Expert assistance was provided to Member States through interregional, regional and national technical cooperation programmes and nuclear security projects in order to establish priority activities for ensuring the security of high activity radioactive sources in use and storage. Physical protection projects to secure radioactive material in fixed and mobile applications were completed in Cuba in

November 2016, the Bolivarian Republic of Venezuela in December 2016 and Viet Nam in May 2017, while projects in Iraq, Lebanon, Libya and Malaysia remain ongoing.

68. Given the vulnerability of radioactive sources once they become disused, the Agency continued to assist States with the secure management of disused sources. Expert missions, focused on the establishment of comprehensive national strategies, were conducted in Indonesia, Uganda and Viet Nam. Removal efforts focused on Lebanon and Tunisia — two high activity disused sources were repatriated to France and the removal of three additional disused sources in Lebanon is in progress. New projects have been initiated in the former Yugoslav Republic of Macedonia and South America (Plurinational State of Bolivia, Ecuador, Paraguay, Peru and Uruguay) during the reporting period.

69. The Agency continued to support Member States in establishing a borehole disposal capacity with targeted assistance in Ghana and Malaysia. In the reporting period, efforts focused on the development of regulations for borehole disposal, the development of guidance to assist competent authorities and operators, expert missions to address technical implementation requirements, the development of mobile hot cell capabilities, the review of site characterization and design reports, and the review of safety and security cases by a team of international experts.

D.6.6. Security of Nuclear and other Radioactive Material in Transport

70. Transport of nuclear and other radioactive material takes place outside secured facilities, which makes transport one of the higher risk activities in the lifetime of these materials. The Agency continues to assist States, upon request, in strengthening transport security arrangements at national level, based on the relevant recommendations, and assisting with their practical implementation.

71. The Agency continued its revision (NST044) of the Implementing Guide entitled *Security in the Transport of Radioactive Material* (IAEA Nuclear Security Series No. 9). The draft was approved for publication by the NSGC. National and regional training courses and workshops on security of nuclear material and other radioactive material during transport were delivered in Argentina in October-November 2016, Chile in September 2016, Egypt in November 2016, Mauritania in September 2016, Mexico in November 2016, Pakistan in October 2016, the Philippines in October 2016 and Sierra Leone in October 2016.

72. The Agency held a Technical Meeting on Security of Nuclear and other Radioactive Material in Transport in Vienna with the participation of 84 participants from 57 Member States and three international organizations in July 2016. The participants shared experiences in implementing Agency transport security recommendations and guidance, discussed ongoing programmes, and identified how the Agency might better assist its Member States in the area of transport security.

D.6.7. Establishing Effective Detection Architecture

73. The Agency has developed a project approach with Member States, coordinating with NSSCs and promoting systems and measures, for the detection of material out of regulatory control. The project approach follows Agency Implementing Guides beginning with a Member State identifying a need to develop nuclear security detection architecture (NSDA). The Agency's support covers how to build and maintain NSDA by identifying a strategy based on threat assessment, a workshop for developing a legal and regulatory framework, and a workshop for risk approach threat assessment. In support of these activities, a workshop was conducted in Kenya in November 2016 which focused on assisting States to build a roadmap to NSDA. An international training course on sustainable training programmes for nuclear security detection was conducted in Vienna.

74. In 2016, a laboratory to support activities in relation to handheld detection equipment was established in the Agency. The mission of this nuclear security laboratory covers three main areas:

- A repository of equipment to loan or donate to a State to support its detection system;
- Management of a pool of equipment that the Agency utilizes for major public events and training, including operation of equipment and calibration;
- Demonstrations of new types of equipment.

75. The Agency cooperated with the Centre for Security Cooperation (RACVIAC) for South Eastern Europe, a regionally owned organization, to deliver workshops on NSDA. A topical meeting to share information on a front line officer network and facilitate the exchange of information was organized in Vienna in February 2016. An International Workshop on Sustainable Training for Nuclear Security Detection took place in Vienna in November 2016 and was attended by participants from 15 Member States.

76. Fourteen States received handheld detection equipment from the Agency: Botswana, Cameroon, Colombia, Cuba, Ghana, Indonesia, Madagascar, Morocco, the Philippines, Tunisia, Tajikistan, Tunisia, Uganda and the United Republic of Tanzania. One radiation portal monitor was provided to the Plurinational State of Bolivia.

D.6.8. Supporting the Nuclear Security Response Framework

77. In order to assist States to develop national response plans for nuclear security events, the Agency has been supporting States to evaluate their abilities to deliver a number of key response activities which are central to a State's planned ability to respond effectively. National workshops on the development of key response capabilities were delivered in the Plurinational State of Bolivia in July 2016 and in Zimbabwe in September 2016. A regional workshop for 23 participants from six English-speaking African countries was held in Ghana in June 2017.

78. To strengthen States' abilities to plan and prepare for the implementation of nuclear security systems and measures in land, maritime and air domains, the Agency co-organized two International Workshops on Nuclear Security Measures and Emergency Response Arrangements for Ports, as well as a technical visit on radiological and nuclear detection and response exchange. These workshops and the technical visit were delivered in the United States of America in October 2016, attended by 34 participants from 15 States.

D.6.9. Major Public Events

79. The Agency has provided, upon request, assistance to States hosting major public events to strengthen the implementation of nuclear security measures before and during the events. Such assistance includes coordination meetings, the delivery of workshops, and training in the use of detection equipment at such events. The Agency also arranged technical visits for senior officials to observe how nuclear security measures at major public events are implemented in other States. During the reporting period, the Agency assisted States, upon request, with the following major public events:

- In Poland, in preparation for Catholic World Youth Day (July 2016);
- In Brazil, in preparation for the Rio Olympic Games and Paralympic Games (August/September 2016);
- In Madagascar, in preparation for the 16th Francophone Summit (November 2016);
- In Cameroon, in preparation for the Africa Women Cup of Nations (November/December 2016);
- In Mali, in preparation for the France–Africa Summit (January 2017);

- In Gabon, in preparation for the 31st Africa Cup of Nations (January/February 2017);
- In Ukraine, in preparation for Eurovision Song Contest 2017 (May 2017); and
- In Kazakhstan, in preparation for Expo 2017 (May 2017)

80. During the reporting period, in the area of nuclear security measures for major public events, the Agency organized and conducted 4 coordination meetings in Uzbekistan in August 2016 and in Vienna in September 2016, February 2017 and March 2017; 12 training workshops in Poland in July 2016, Morocco in July 2016, Brazil in August–September 2016, Madagascar in August 2016 and November 2016, Cameroon in November 2016, Mali in November 2016, Gabon in December 2016, Uzbekistan in February 2017 and April 2017, Ukraine in April 2017, and Kazakhstan in May 2017; and 2 technical visits in France in September 2016 and in the United States of America in January 2017. The Agency also loaned a total of 650 radiation detection instruments.

81. The Agency purchased 125 personal radiation detectors, 20 radionuclide identification devices, 15 mobile detection systems and one high purity germanium detector to enhance its ability to assist Member States, upon request, with nuclear security measures at major public events.

D.6.10. Radiological Crime Scene Management

82. Radiological crime scene management (RCSM) has been the topic of a regular training course conducted by the Agency in a number of States. In December 2016, the Agency extended its training programme of advisory services related to RCSM that provides specific, tailored recommendations to a State on how to build capacity for RCSM in an effective and sustainable manner.

83. Activities are undertaken on the basis of INSSP reports and through direct requests received from States. In the reporting period the Agency conducted training workshops on RCSM in Viet Nam in August 2016, Burkina Faso in September 2016, Spain in November 2016, Pakistan in December 2016, Ukraine in February 2017, Iraq in March 2017, Egypt in March 2017 and Cuba in May 2017, training a total of 279 personnel from various national agencies with responsibilities related to crime scene operations.

D.6.11. Nuclear Forensics

84. The Agency continued its assistance to Member States in the response to nuclear and other radioactive materials encountered out of regulatory control through the development and sustainability of nuclear forensics functions as part of a nuclear security infrastructure. The Agency conducted technical visits and expert missions on the practice of nuclear forensics in China, Indonesia, Mexico and Thailand. During the reporting period, the Agency designed the Centre for Energy Research in Hungary as an Agency Collaborating Centre in Nuclear Forensics. The Agency further organized the international nuclear forensics methodologies applied training course for practitioners in Germany in October 2016, in cooperation with the European Commission's Joint Research Centre and the US National Nuclear Security Administration. Other Agency introductory training courses were convened in Hungary and Pakistan. To facilitate the provision of assistance, the Agency signed Practical Arrangements with the Stockholm International Peace Research Institute.

D.6.12. Contingency Planning and Exercises

85. The Agency continued the drafting of Technical Guidance provisionally entitled *Developing a Nuclear Security Contingency Plan for Nuclear Facilities*. This Technical Guidance will benefit States, competent authorities and operators during the development of nuclear security contingency plans for nuclear facilities. The Technical Guidance was approved by the NSGC in June 2017 for submission to Member States for comment.

86. The Agency continued the drafting of a publication provisionally entitled *Preparation, Conduct and Evaluation of Exercises to Test Contingency Plans at Nuclear Facilities* which will provide practical guidance for facility operators to efficiently and effectively prepare, conduct and evaluate nuclear security contingency response exercises. The competent authority responsible for creation of a State's contingency response exercises could also use this publication to prepare, conduct and evaluate State level contingency response exercises.

87. In November 2016, the IAEA supported the Thai and Malaysian authorities in their work to prevent, detect, and respond to criminal acts involving nuclear and other radioactive materials by assisting in the design, planning and implementation of a field training exercise on the detection of material out of regulatory control. This cross-border exercise, involving around one hundred customs officials, police officers and radiation detection experts from Thailand and Malaysia tested the effectiveness of their nuclear security systems and improved the effectiveness of information sharing protocols.

E. Management Issues

E.1. Funding

88. Expenditure in the period from 1 July 2016 to 30 June 2017 was €38.0 million. This expenditure comprised disbursements (€ 25.7 million) plus unliquidated obligations (€ 12.3 million).

89. In the period 1 July 2016 to 30 June 2017, the Agency accepted pledges to the Nuclear Security Fund from Albania, Canada, China, Estonia, the European Union, France, Germany, Hungary, India, Japan, Kazakhstan, Republic of Korea, New Zealand, Other Minor Donors, Spain, Switzerland, United Arab Emirates, United Kingdom and United States of America.

F. Goals and Priorities for 2017–2018

90. In line with the ongoing priorities identified by Member States, the following are the main nuclear security programmatic goals and priorities for 2017–2018, subject to the Nuclear Security Plan 2018–2021 and availability of resources:

- Conduct the International Conference on Physical Protection of Nuclear Material and Nuclear Facilities in Vienna in November 2017;
- Promote further adherence to the Amendment to the CPPNM with the aim of its universalization and initiate preparations for the Review Conference on the Amendment to the CPPNM to take place in 2021;
- Initiate preparations for the International Conference on Global Radioactive Material Security Governance: Prevention and Detection in Action to be held in Vienna in December 2018;
- Prepare a report on the implementation of the Nuclear Security Plan 2014-2017.