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Nuclear Security Report 2019

Report by the Acting Director General

Summary

This report has been produced for the sixty-third regular session (2019) of the General Conference in response to resolution GC(62)/RES/7, 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 2018–30 June 2019.

Recommended Action

It is recommended that the Board of Governors take note of the Nuclear Security Report 2019.

Nuclear Security Report 2019

Report by the Acting Director General

A. Introduction

1. This report has been produced for the sixty-third regular session of the General Conference in response to resolution GC(62)/RES/7. In operative paragraph 47 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 and priorities for the year to come. This report covers the period 1 July 2018–30 June 2019.

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 2018–2021, approved by the Board of Governors in September 2017 and taken note of by the General Conference at its 61st regular session in September 2017. All activities were undertaken with due regard to the protection of confidential information.

B. Major Achievements

B.1. Highlights

3. As set out in the Nuclear Security Plan 2018-2021, the objective of the Agency's Nuclear Security Programme is:

- To contribute to global efforts to achieve effective nuclear security, by establishing comprehensive nuclear security guidance and, upon request, promoting its use through peer reviews and advisory services and capacity building, including education and training;
- To assist in adherence to, and implementation of, relevant international legal instruments, and in strengthening the international cooperation and coordination of assistance; and
- To play the central role and enhance international cooperation in nuclear security, in response to the priorities of Member States expressed through the decisions and resolutions of the Agency's Policy Making Organs.

During the reporting period, the Agency recorded achievements in each of these areas, described in more detail in Sections B.2–B.5 of this report. Particular highlights are given below.

4. In December 2018, the Agency organized the International Conference on the Security of Radioactive Material: The Way Forward for Prevention and Detection in Vienna. The conference, with more than 550 participants from over 100 Member States, brought together experts in material and facility protection and in the security of radioactive material out of regulatory control. The Agency organized two programme committee meetings in Vienna in July and November 2018, in preparation for the International Conference on Nuclear Security: Sustaining and Strengthening Efforts (ICONS 2020), to be held in February 2020.

5. In December 2018, the Secretariat facilitated an informal meeting of the Parties to the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM), in preparation for the 2021 Conference of the Parties. Over 50 Parties to the Amendment and the CPPNM attended the meeting. The Agency also conducted one regional workshop to encourage States to adhere to the CPPNM and its Amendment.

6. The Agency published five new guidance publications in the IAEA Nuclear Security Series s and more than 2000 participants from 145 States took part in 101 training activities based on the Series. An additional 1516 users from 140 States completed 4236 e-learning modules.

7. The Agency conducted three International Physical Protection Advisory Service (IPPAS) missions and published new guidelines for the International Nuclear Security Advisory Service (INSServ). Three Member States formally approved Integrated Nuclear Security Support Plans (INSSPs) bringing the total number of approved INSSPs to 83.

8. The Agency provided assistance to seven States hosting nine major public events to strengthen the implementation of nuclear security measures before and during the events.

9. During the reporting period, the Agency repatriated three high activity disused radioactive sources, and initiated four new projects for the removal and consolidation of additional high activity disused sources. At the request of five Member States, the Agency continued to assist with physical protection upgrades for nuclear facilities. Physical protection projects to secure radioactive material in fixed applications in two Member States were completed and three such projects are ongoing. The Agency continued to support two Member States in establishing a borehole disposal capacity through a pilot project. Finally, the Agency completed the conversion of a research reactor from the use of high-enriched uranium to low-enriched uranium.

10. The Division of Nuclear Security continued to strengthen its coordination with other parts of the Agency.

B.2. Information Management

11. Agency work in this sub-programme is carried out under three projects: assessing nuclear security needs and priorities, information sharing, and information and computer security and information technology services.

B.2.1. Assessing nuclear security needs and priorities

Integrated Nuclear Security Support Plans

12. 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 enhancing their nuclear security regimes. The development and

implementation of INSSPs also enables increased coordination between the Agency, the State concerned and potential donors to ensure appropriate allocation of resources and to avoid duplication of efforts.

13. Three Member States formally approved their INSSPs, bringing the number of approved INSSPs to 83. As of 30 June 2019, 19 INSSPs were awaiting Member State acceptance and 4 INSSPs were awaiting finalization with the respective Member States. The Agency held 22 INSSP review meetings and 8 INSSP finalization meetings.

14. The Agency held three regional coordination meetings: for Latin America and the Caribbean in Bridgetown, in July 2018; for South and East Asia in Beijing, in November 2018; and for Central Asia in Almaty, Kazakhstan, in June 2019. In addition, nine expert missions were undertaken to raise awareness of nuclear security among decision-makers in Africa, Latin America and the Caribbean, and Asia.

15. Efforts were initiated to assist Member States to better prepare for INSSP review and finalization meetings, including through the development of a preparatory information package that will be provided to Member States prior to these meetings, an INSSP user manual and convening of preparatory discussions via videoconferences.

Nuclear Security Information Management System

16. The Agency continued to maintain and update the Nuclear Security Information Management System (NUSIMS), a web-based platform for States to perform nuclear security self-assessments on a voluntary basis. Ninety-seven Member States have nominated points of contact for NUSIMS. NUSIMS questionnaires were systematically used in INSSP finalization and review meetings. The Agency conducted INSSP meetings in Africa, Latin America and the Caribbean, Europe and Asia using NUSIMS as a tool to frame discussions. These meetings also aimed to increase awareness of NUSIMS and to facilitate its use by Member States.

B.2.2. Information Sharing

Incident and Trafficking Database

17. In the period between the inception of the Incident and Trafficking Database (ITDB) and 30 June 2019, States had reported — or otherwise confirmed to the ITDB — a total of 3565 incidents. Reports of 186 incidents were added to the database in the reporting period. Of these incidents, 117 occurred between 1 July 2018 and 30 June 2019. While the Agency does not verify States' reports, the number of incidents voluntarily reported by participating States to the ITDB demonstrates that illicit trafficking, thefts, losses and other unauthorized activities and events involving nuclear and other radioactive material continue to occur.

18. Of the 186 newly reported incidents, 7 were related to trafficking, including 4 scams. 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.

19. There were 33 reported incidents in which the intent to conduct trafficking or malicious use could not be determined. These included 18 thefts, 1 unauthorized possession and 14 incidents of missing materials. In 27 incidents the materials were not recovered, all of which involved lower-risk sources below category 3.

20. There were also 146 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.

21. 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 (including the Joint Research Centre Karlsruhe), the European Atomic Energy Community, the European Police Office, and the Organization for Security and Co-operation in Europe. As stated in the ITDB Terms of Reference, these external users receive only “unrestricted information” reported in Part I of the ITDB incident notification form.

22. During the reporting period, the Agency provided information on incident notifications and conducted membership outreach through two information and coordination workshops: one for Southeast Asia, held in Kuala Lumpur in November 2018; and one for Latin America and the Caribbean, held in Montevideo in November 2018.

23. During the reporting period, the Agency also provided quarterly ITDB analytical summary reports, an annual fact sheet summarizing ITDB incidents for public information and, in response to requests from Member States, additional information services in support of six major public events. Further details of the events are set out in paragraphs 83-85 of this report.

24. The ITDB programme provided analytical support in the development and implementation of INSSPs for 13 Member States.

Nuclear Security Information Portal

25. The Agency continued to maintain and improve the Nuclear Security Information Portal (NUSEC), an information tool for Member States that supports the exchange of information across the nuclear security community. The web-based NUSEC has more than 5300 registered users from 166 Member States and 17 organizations. An approximately 10 per cent increase in registered users in the past year has enabled the Agency to reach a wider international security community with information on developments in nuclear security. Improvements made to NUSEC in the reporting period include a re-design of the International Nuclear Security Education Network (INSEN) pages, further enhancements to the International Network for Nuclear Security Training and Support Centres database and continued improvements to the common calendar.

B.2.3. Information and Computer Security, and Information Technology Services

Assistance provided to States

26. During the reporting period, the Agency convened four international and regional training courses on computer security: in October 2018 in Nairobi; in July 2018 in Yerevan; in August 2018 in Idaho Falls, United States of America; and in Vienna in December 2018. The Agency also held two regional workshops related to computer security: for European Member States in Delft, Netherlands, in October 2018; and for Northern Africa and Middle Eastern Member States in Vienna, in March 2019.

27. The Agency held the Technical Meeting on Conducting Computer Security Exercises for Nuclear Security in Vienna, in September 2018, involving 72 participants from 41 Member States and the Technical Meeting on Conducting Computer Security Assessments in Daejeon, Republic of Korea, in November 2018, involving over 100 participants from 33 Member States.

B.3. Nuclear Security of Materials and Associated Facilities

28. Agency work in this sub-programme is carried out under four projects corresponding to four areas of expertise relevant to nuclear security of nuclear and other radioactive materials and associated facilities and activities: nuclear security approaches for the whole nuclear fuel cycle, enhancing nuclear material security using accounting and control, upgrading security of radioactive material and associated facilities, and nuclear security in transportation of nuclear and other radioactive material.

B.3.1. Nuclear Security Approaches for the Whole Nuclear Fuel Cycle

Guidance development

29. The Implementing Guide *Security during the Lifetime of a Nuclear Facility* was published as IAEA Nuclear Security Series No. 35-G. Technical Guidance provisionally entitled *Handbook on the Design of Physical Protection Systems for Nuclear Material and Nuclear Facilities*, which will replace the *Handbook on the physical protection of nuclear material and facilities (IAEA-TECDOC-1276)* published in 2002, and Technical Guidance provisionally entitled *Developing a Nuclear Security Contingency Plan for Nuclear Facilities* received final approval for publication.

Assistance provided to States

30. The Agency provides assistance to States, on request, for the development and enhancement of their regulatory frameworks for nuclear security. During the reporting period, the Agency provided support to Egypt, Ghana and Morocco to review and finalize their draft regulations on physical protection of nuclear material and facilities through national workshops and expert missions.

31. During the reporting period, the Agency conducted three international training courses and workshops on regulatory frameworks and physical protection of nuclear material and facilities: in Chakri, Pakistan, in September 2018; in Rawalpindi, Pakistan, in April 2019; and in Beijing, in June 2019. The Agency also conducted two regional training courses on the subject: for Latin America in Ocoyoacac, Mexico, in August 2018; and for Africa in Rabat, in June 2019.

32. The Agency also conducted national training courses and workshops on various aspects of the physical protection of nuclear material: in Kuala Lumpur, in November 2018 and March 2019, and in La Paz and Cairo in April 2019.

33. The Agency, in cooperation with the Russian Federation, conducted three training courses in Obninsk, Russian Federation: an international training course on the practical operation of physical protection systems at nuclear facilities in October 2018; and two regional training courses, one on field training for university students, in November 2018, and one on physical protection inspections at nuclear facilities in November 2018.

34. Through the Uranium Ore Concentrate (UOC) project, the Agency has continued to assist Member States through training courses based on the Agency publication *Nuclear Security in the Uranium Extraction Industry*. The courses focus on implementing prudent management practices to protect, control and manage UOC in processing, storage and transport. The Agency conducted an international training course on nuclear security in the uranium extraction industry in Beijing in August 2018.

35. At the request of five Member States, the Agency provided assistance with physical protection upgrades for nuclear facilities.

Cross-cutting themes

36. Work described in this section relates primarily to the facilities and activities involving nuclear and other radioactive material, including transport.

Threat characterization and assessment

37. The Agency continued to advise States on threat characterization and assessment; the development, use and maintenance of design basis threats (DBTs) or representative threat statements; vulnerability analysis; and the development of methodologies for performance assessment of physical protection systems.

38. The Agency delivered nine national DBT workshops: in Cairo, in Riyadh, in Pretoria, in Khartoum and in Chakri, Pakistan, in October 2018; in Bangkok, in December 2018; in Bogota, in March 2019; and in Baku and in Bishkek, in May 2019. During the reporting period, the Agency created a database of its activities related to DBTs and threat assessment that enables more effective response to requests from States for assistance and more efficient allocation of resources in this area.

Nuclear security culture

39. Technical Guidance provisionally entitled *Enhancing Nuclear Security Culture in Organizations Associated with Nuclear and Other Radioactive Material* received final approval for publication in the IAEA Nuclear Security Series.

40. The Agency continued its efforts to enhance understanding of nuclear security culture and its application in practice through national workshops held in Yerevan, in November 2018, in Nairobi, in April 2019 and in Tbilisi, in May 2019.

41. The Agency implements coordinated research projects (CRPs) under the Nuclear Security Plan to promote research and development in the area of nuclear security. Details of all CRPs implemented under the Nuclear Security Plan can be found on the NUSEC portal and the Agency's website¹. The CRP entitled "Development of Nuclear Security Culture Enhancement Solutions" was completed in September 2018, and preparation of the results for publication as a TECDOC is now underway. As part of the CRP, ten participating institutions conducted research and developed a database of nuclear security events in order to identify ways to further strengthen nuclear security culture and identified challenges and advantages for different approaches to nuclear security culture self-assessment.

Safety - Security Interface

42. The Technical Meeting on the Safety and Security Interface — Approaches and National Experiences, was held in Vienna in October–November 2018. Over 120 participants from 64 Member States met to exchange information on approaches to addressing the interfaces, to identify good practices, and to make recommendations to the Agency in managing safety and security interfaces effectively.

International Physical Protection Advisory Service

43. Since 1996, 87 International Physical Protection Advisory Service (IPPAS) missions have been conducted, upon request, in 51 Member States. During the reporting period, IPPAS missions were conducted in Japan in November–December 2018, in Lebanon in February 2019, and in Belgium in June 2019.

¹ <https://cra.iaea.org/cra/explore-crps/all-active-by-programme.html>

44. The Agency held a national IPPAS workshop in Beirut, in November 2018 to provide information on the processes for preparing and conducting IPPAS missions and on the benefits of such missions.

B.3.2. Enhancing Nuclear Material Security Using Accounting and Control

Guidance development

45. The Technical Guidance *Establishing a System for Control of Nuclear Material for Nuclear Security Purposes at a Facility during Use, Storage and Movement* was published as IAEA Nuclear Security Series No. 32-T.

Assistance provided to States

46. The Agency held an international training course on nuclear material accounting and control for nuclear security purposes in Los Alamos, United States of America, in August 2018 involving accounting and control measures exercises performed on real nuclear material in a laboratory environment. Twenty-four participants from 17 Member States took part in the two-week course. A national training course on nuclear materials security using accounting and control was also held in Manila, in March 2019.

47. An international training course on establishing a system of control for nuclear materials for nuclear security purposes at facilities during use, storage and movement was held in Bahadurgarh, India, in September 2018.

Advising States on preventive and protective measures against insider threats

48. The Agency held an international training course on insider threats related to nuclear material in Bahadurgarh, India, in December 2018, and a regional training course on insider threats related to radioactive material in Nairobi, Kenya, in July–August 2018. A national training courses on insider threats related to radioactive material was held in Tirana, in October 2018.

49. A CRP entitled “Preventive and Protective Measures Against Insider Threats at Nuclear Facilities” was initiated. The objective of this CRP is to enhance existing preventive and protective measures against insider threats to reduce the risk of theft of nuclear material and sabotage at nuclear facilities.

B.3.3. Upgrading Security of Radioactive Material and Associated Facilities

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

Assistance provided to States

51. The Agency continued its project dedicated to enhancing the national regulatory frameworks for nuclear security in African States. The objective of the project is to assist States in the development and drafting of regulations to support national nuclear security regimes. As part of this project, the first School on Drafting Nuclear Security Regulations for African Countries was convened in February 2019 and was attended by 18 participants from 10 Member States. It was held back-to-back with the third Session of the School for Drafting Regulations on Radiation Safety for African Countries under the Technical Cooperation Programme.

52. In addition, the Agency continued a similar project, with a focus on enhancing frameworks for both safety and security for eight States in Latin America and the Caribbean. A regional workshop on establishing an integrated management system for senior regulators was held by the Agency in Vienna, in July 2019, and a regional event on establishing national registers of radiation sources was hosted by

El Salvador in San Salvador in April 2019. The Agency conducted safety–security advisory missions in Paraguay and Uruguay in August 2018, and in Costa Rica in September 2018.

53. During the reporting period, the Agency conducted six regional training courses on security of radioactive sources: for Europe and Central Asia in Brussels and in Moscow, in November 2018 and in Obninsk, Russian Federation, in December 2018 and May 2019; for Asia and the Pacific in Kuwait City, in November 2018; and for Latin America in Montevideo, in May 2019. National training courses were held in Addis Ababa, in October 2018 and in Bangkok, in November 2018.

54. The Agency also revised standard training material based on *Security of Radioactive Sources* (IAEA Nuclear Security Series No. 11).

55. Expert assistance was provided to Member States through international, regional and national technical cooperation projects and nuclear security projects. Physical protection projects to secure radioactive material in fixed applications in Egypt, Libya and Pakistan are ongoing, and projects in Iraq, and Lebanon were completed. In addition, a new Physical Protection Laboratory was established in Malaysia focusing on the protection of radioactive material, with Agency support.

56. The Agency continued to assist States with the secure management of disused sources. Removal and consolidation efforts focused on Albania and North Macedonia — three high activity disused sources were removed from these countries during the reporting period. New projects have been initiated in Bahrain, Colombia and Tunisia for the removal of high activity disused sources, and in Colombia for the consolidation of nine high activity disused sources. A new project was also launched in April 2019 to support the sustainable management of disused radioactive sources in twelve countries in Asia, Africa, Latin America and the Caribbean.

57. The Agency continued to support Member States in establishing a borehole disposal capacity through a pilot project for Ghana and Malaysia. This project 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. The peer review of the Malaysian Nuclear Agency mobile hot cell took place in November 2018.

Supporting continued dialogue on the security of radioactive sources

58. The eighth meeting of the Working Group on Radioactive Source Security took place in Vienna in April 2019 and was attended by 90 participants from 61 Member States and 2 observer organizations. During the meeting, the Working Group approved revised terms of reference, expanding its mission from security of radioactive sources to security of radioactive material. Participants shared best practices for securing radioactive material in use and storage.

Support for the Code of Conduct on the Safety and Security of Radioactive Sources

59. As of 30 June 2019, 137 States have made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 118, including 4 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. A total of 143 States have nominated points of contact to facilitate the export and import of radioactive sources. Nineteen States have notified the Director General of their intention to act in a harmonized manner and in accordance with the Code's supplementary Guidance on the Management of Disused Radioactive Sources, including 16 States in the reporting period.

60. The Agency held an Open-ended Meeting of Technical and Legal Experts to Share Information on States' Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance in Vienna, in May 2019, attended by more than 150 participants from 100 Member States; and a similar meeting aimed specifically at small island developing States from the Caribbean and the Pacific areas, in Vienna, in August 2018, at which 34 experts from 17 Member States shared experiences on the application of the Code of Conduct. The Agency held three regional meetings on this topic for the Africa region in Kampala, in September 2018, attended by 32 participants from 28 Member States, and in Lusaka, in March 2019, attended by 32 participants from 28 Member States; and for the Latin America and the Caribbean region in Montevideo, in October 2018, attended by 19 participants from 12 Member States.

Coordinated Research Projects

61. A CRP entitled "Improving the Security of Radioactive Material throughout its Lifecycle, Associated Facilities, and Associated Activities" was initiated in February 2019. This CRP will focus on an examination of radioactive material and current safety thresholds to validate their appropriateness for security, an assessment of security measures for radioactive material in fixed and portable applications to identify gaps and develop solutions to address those gaps, and an analysis of security measures.

B.3.4. Nuclear security in the Transport of Nuclear and other Radioactive Material

Guidance development

62. The draft Implementing Guide *Security of Radioactive Material in Transport* (IAEA Nuclear Security Series No. 9 (Rev. 1)) received final approval for publication.

Assistance provided to States

63. The Agency continues to assist Member States, upon request, in strengthening transport security arrangements at the national and international levels, based on the relevant recommendations, and with their practical implementation.

64. The Agency held regional workshops aimed at improving the coordination between States for the security of nuclear and other radioactive material in transport and focusing on table-top exercises for French-speaking African States in Abidjan, Côte d'Ivoire, in October 2018 and in Dakar, in June 2019. In addition, a pilot regional training course on conducting a transport security inspection was conducted for English-speaking African States in Arusha, United Republic of Tanzania in January 2019.

65. The Agency assisted States with the development and improvement of national regulatory infrastructures related to transport security of nuclear and other radioactive material. Seven workshops were held to discuss completed regulations: in Kinshasa, in August 2018; in Cairo, in November 2018; in Kampala, in February 2019; in Nouakchott, in March 2019; in Baghdad, in April 2019; in Cotonou, in May 2019; and in Accra, in May 2019.

66. The Agency held a Technical Meeting on the Security of Nuclear and Other Radioactive Material in Transport in Vienna in July 2018, attended by 140 participants from 74 Member States.

B.4. Nuclear Security of Materials out of Regulatory Control

67. Agency work under this sub-programme is carried out under three projects: institutional infrastructure for nuclear and other radioactive material out of regulatory control, nuclear security

detection and response architecture, and radiological crime scene management and nuclear forensic science.

B.4.1. Institutional Infrastructure for Material out of Regulatory Control

Assistance provided to States

68. The Agency continued work on a project to design and supply radiation portal monitor maintenance and calibration training units to Nuclear Security Training and Support Centres (NSSCs). These training units, when complete, will enable States to more effectively perform hands-on training of front-line officers responsible for the maintenance and calibration of radiation portal monitors. The Agency also continued work on the Integrated Nuclear Security Network project, which aims to develop a networked system that enables States to more effectively maintain awareness of the status of their radiation detection equipment.

69. The Agency held eight training events at its Nuclear Security Detection and Monitoring Equipment Laboratory in Vienna on testing methods for detection equipment: for Argentina, Egypt and the Sudan in August 2018; for Mauritania in December 2018; for the Islamic Republic of Iran in February 2019; and for Egypt, Niger and the United Republic of Tanzania in May 2019. Training to support major public events was provided for seven Member States: Argentina, Belarus, Indonesia, Niger, Panama, Peru, and the United Republic of Tanzania.

INSServ missions

70. The Agency published new guidelines for INSServ missions during the reporting period. The new guidelines are primarily for team members of INSServ missions and Member States that are considering hosting a mission.

B.4.2. Nuclear Security Detection and Response Architecture

71. The Agency develops guidance and provides training and assistance to States, upon request, to establish and sustain their capabilities to detect criminal or intentional unauthorized acts involving nuclear and other radioactive material out of regulatory control, and to respond to nuclear security events. The Agency also initiates and manages CRPs to address emerging nuclear security issues identified by Member States and to enhance States' technical capabilities.

Guidance development

72. The Technical Guidance entitled *Planning and Organizing Nuclear Security Systems and Measures for Nuclear and Other Radioactive Material out of Regulatory Control* was published as IAEA Nuclear Security Series No. 34-T. The Technical Guidance provisionally entitled *Preparation, Conduct and Evaluation of Exercises for Detection of and Response to Acts Involving Nuclear and Other Radioactive Material out of Regulatory Control* and the Implementing Guide provisionally entitled *Developing a National Framework for Managing the Response to Nuclear Security Events* received final approval for publication during this period. The Technical Guidance provisionally entitled *Detection at State Borders of Nuclear and Other Radioactive Material out of Regulatory Control* was approved by the Nuclear Security Guidance Committee (NSGC) to be sent to Member States for a 120-day review period.

Assistance provided to States

73. The Agency uses a project approach to assist Member States, upon request and in coordination with NSSCs, for the detection of material out of regulatory control. The project approach follows the Agency's Implementing Guides, beginning with a Member State identifying a need to develop nuclear

security detection architecture. The Agency's assistance covers development and maintenance of a nuclear security detection architecture by identifying a strategy based on threat assessment, a workshop for developing a legal and regulatory framework, and a workshop on the risk-informed approach and threat assessment. In support of these activities, the Agency conducted regional workshops for Africa in Abidjan, Cote d'Ivoire, in October 2018 and in Arusha, United Republic of Tanzania, in May 2019, which focused on assisting States to develop a roadmap for a nuclear security detection architecture. A new project on nuclear security detection architecture was initiated for Cuba, and experts were provided for national workshops: in Maseru, in April 2019; in Dar es Salaam, United Republic of Tanzania in April 2019; and in Kampala, in May 2019.

74. The Agency continued its cooperation with the Centre for Security Cooperation (RACVIAC) for South Eastern Europe to deliver workshops on nuclear security detection architecture. A regional workshop on the planning, implementation and evaluation of detection operations took place in Zagreb, in October 2018 with the cooperation of RACVIAC.

75. During the reporting period, the Agency conducted two international training courses on the detection of material out of regulatory control in Beijing, in November 2018; and at Argonne National Laboratory, United States of America, in May 2019. The Agency also conducted three regional workshops and training courses on this topic: for Asia and the Pacific in Kota Kinabalu, Malaysia, in cooperation with the Global Initiative to Combat Nuclear Terrorism, in August 2018; for French-speaking African States in Rabat, in November 2018; and for English-speaking African States in Nairobi, in March 2019.

76. The First Meeting of the International Network of Front Line Officers was held in Vienna, in October 2018. This meeting established the Network, which provides a platform for direct communication between individual front line officers from Member States and organizations, enhancing their ability to exchange good practices and coordinate detection and response capabilities, including across borders.

77. The Agency continued to provide support to Member States on the detection of nuclear and other radioactive material in urban areas. An international workshop on this topic was convened in Buenos Aires, in November 2018.

78. The Agency maintains a laboratory to support activities in relation to handheld detection equipment. The laboratory's aim is to provide a repository of equipment to loan or donate to a State to support its detection system; to manage the pool of equipment used by the Agency for major public events and training, including operation of equipment, frontline maintenance and calibration; and to perform demonstrations of new types of equipment.

79. The Agency provided handheld detection equipment to 21 Member States: Argentina, Belarus, Chile, Cuba, Ecuador, Egypt, Guatemala, Indonesia, Madagascar, Mauritania, Mongolia, Morocco, Mozambique, Niger, Panama, Paraguay, Peru, the Republic of Moldova, Sudan, the United Republic of Tanzania and Uruguay.

80. The Agency supported Member States in evaluating their capabilities to respond effectively to nuclear security events, in order to assist them to develop national response plans. Two regional workshops on developing national frameworks for managing the response to nuclear security events were held: for French-speaking African States in Rabat, in July 2018; and for English-speaking African States in Khartoum in September 2018.

81. The Agency co-organized an International Workshop with the United States of America on Nuclear Security Measures and Emergency Response Arrangements for Ports to strengthen Member States' capabilities to plan and prepare for the implementation of nuclear security systems and measures

in land, maritime and air domains. This workshop was delivered in Las Vegas, United States of America, in November 2018.

82. The Agency also assists with training exercises to help Member States test and strengthen their capability to respond to nuclear security events, following a pilot project initiated in Morocco during the previous reporting period. Two training exercises were held in Layoun and Marrakesh, Morocco, in September 2018. A preparatory meeting was also held in Rabat in August 2018 and a debriefing meeting was held in Rabat in March 2019. The Agency held a meeting in Vienna, in June 2019, to initiate a second, similar project focused on exercises testing cross-border response for Georgia, the Republic of Moldova and Ukraine.

Major public events

83. The Agency provides, 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. During the reporting period, the Agency assisted with the following major public events: the 2018 G20 Buenos Aires Summit in Argentina, the 2nd European Games in Belarus, the 18th Asian Games in Indonesia, the African Union Assembly of Heads of State and Government in the Niger, the World Youth Day 2019 in Panama, the 2019 Pan American Games and the 2019 Parapan American Games in Peru, the 2019 Africa U17 Cup of Nations in the United Republic of Tanzania, and the International Monetary Fund and World Bank Summit.

84. The Agency held one international workshop on nuclear security measures for major public events in Washington, D.C., in June 2019 and one regional workshop for French-speaking African States in Paris, in November 2018. The Agency also held six national training workshops: in Buenos Aires, in June and October 2018; in Panama City, in December 2018; in Dar es Salaam, in March 2019; in Paris for the Niger, in April 2019; and in Minsk, in May 2019. In addition, the Agency organized five coordination meetings in Vienna, for the Niger, in November 2018; for the United Republic of Tanzania, in December 2018; for Belarus, in December 2018; for the United Arab Emirates, in June 2019; and for Mozambique, in June 2019. The Agency also initiated a revision of the training curriculum for major public events, in order to better tailor the training to States' needs.

85. The Agency loaned a total of 847 radiation detection instruments to States in association with major public events.

Coordinated research projects

86. During the reporting period, a CRP entitled "Advancing Maintenance, Repair and Calibration of Detection Instruments" was initiated. This CRP aims to improve the effectiveness of radiation detection equipment and reduce costs by using new approaches to maintenance, repair and calibration. Easier maintenance, repair, and calibration will assist Member States in managing their equipment, reducing its life cycle costs and improving long-term sustainability.

B.4.3. Radiological Crime Scene Management and Nuclear Forensics Science

Assistance provided to States

87. The Agency conducts regular training courses in radiological crime scene management based on INSSP requests and in response to direct requests received from States. During the reporting period, the training materials for this course were revised and updated, in cooperation with INTERPOL. The Agency initiated a project to provide Member States with equipment required for radiological crime

scene management, under which Bolivia, Colombia, Cuba, Ecuador, and the Republic of Moldova were provided with equipment during the reporting period.

88. The Agency continued its assistance to Member States in responding to events involving nuclear and other radioactive materials encountered out of regulatory control by supporting the development and sustainability of nuclear forensics capabilities as part of a nuclear security infrastructure.

89. The Agency organized an international training course for practitioners in nuclear forensics methodologies at Pacific Northwest National Laboratory, United States of America, in April–May 2019, in cooperation with the United States National Nuclear Security Administration and with technical support from the European Commission’s Joint Research Centre. International training courses providing a practical introduction to nuclear forensics were held in Budapest, in October 2018, and in Lucas Heights, Australia, in February–March 2019. Regional introductory training courses were convened for Latin America in Buenos Aires, in September 2018 and for Africa in Dakar, in November 2018. An introductory seminar in nuclear forensics science was also held in Moscow, in May 2019.

90. The Agency encouraged international collaboration in nuclear forensics research by providing funding for the placement of an Argentine scientist at Lawrence Livermore National Laboratory, United States of America, in September–October 2018. To promote functional skills in the nuclear forensics laboratory, the Agency also provided for the placement of experts from Bulgaria, Kazakhstan, Romania and Thailand at the Centre for Energy Research in Budapest in November–December 2019.

91. To facilitate the provision of assistance, the Agency signed Practical Arrangements with the Australian Nuclear Science and Technology Organisation in December 2018.

92. In April 2019, the Agency hosted a Technical Meeting on Nuclear Forensics: Beyond the Science, which attracted more than 150 participants from 80 Member States and two organizations. The meeting highlighted the sharing of experience in developing and sustaining nuclear forensics programmes and conducting nuclear forensic examinations.

B.5. Programme Development and International Cooperation

93. Agency work under this sub-programme is carried out under three projects: international cooperation on nuclear security networks and partnerships, coordinating nuclear security guidance and advice services, and education and training programmes for human resource development.

B.5.1. International Cooperation on Nuclear Security Networks and Partnerships

Promoting further adherence to international legal instruments

94. In May 2019, the Agency conducted an international seminar to provide States Parties to the CPPNM without permanent representation in Vienna with information and encourage them to adhere to the Amendment to the CPPNM. The Agency conducted one regional workshop on the CPPNM and its Amendment for Russian-speaking countries in Obninsk, in November 2018².

95. The fourth Technical Meeting of the Representatives of States Parties to the CPPNM and the CPPNM Amendment was held in Vienna in December 2018, with the participation of around 60 Parties to the CPPNM and the Amendment. The representatives discussed, inter alia, laws and regulations giving effect to the CPPNM and its Amendment, as well as the role of designated Points of Contact.

² The latest status for the Amendment to the CPPNM is available at the following link: http://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf

96. In December 2018, the Secretariat also facilitated an informal meeting of the Parties to the Amendment to the CPPNM, which initiated preparations for the 2021 Conference of the Parties. Over 50 Parties to the Amendment and the CPPNM attended the meeting.

97. The Agency also continued to maintain the database of points of contact for the CPPNM and its Amendment and of national legislation and regulations giving effect to the CPPNM and its Amendment, as provided by States Parties.

98. The International Convention for the Suppression of Acts of Nuclear Terrorism gained three States Parties during the reporting period, bringing the total number to 116 as of 30 June 2019.

Playing a central and coordinating role in nuclear security

99. The Agency hosted two Information Exchange Meetings in Vienna, in October 2018 and in April 2019 to coordinate activities in nuclear security and to avoid duplication in the activities undertaken by various relevant organizations. Participants from 11 organizations and initiatives exchanged information, discussed various themes within nuclear security, and reached a better understanding of activities being undertaken by each organization.

100. The Agency organized the International Conference on the Security of Radioactive Material: The Way Forward for Prevention and Detection in Vienna, in December 2018. The conference, with more than 550 participants from over 100 Member States, brought together experts in material and facility protection and in the security of radioactive material out of regulatory control. Participants shared lessons learned and good practices in implementing *Nuclear Security Recommendations on Radioactive Material and Associated Facilities* (IAEA Nuclear Security Series No. 14) and *Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control* (IAEA Nuclear Security Series No. 15). Topics addressed included international cooperation, communication, sustainability of national nuclear security regimes, State experiences in prevention and detection, the roles and initiatives of international organizations, securing nuclear material during its full life cycle and the detection of radioactive material involved in criminal and unauthorized acts.

101. The Agency organized two programme committee meetings in Vienna, in July and November 2018, in preparation for the International Conference on Nuclear Security: Sustaining and Strengthening Efforts (ICONS 2020), to be held in February 2020. From April to June 2019, the Agency also facilitated informal open-ended consultations on the Ministerial Declaration for this conference.

B.5.2. Education and Training Programmes for Human Resource Development

Guidance development

102. The Implementing Guide *Sustaining a Nuclear Security Regime* was published as IAEA Nuclear Security Series No. 30-G, and the Implementing Guide *Building Capacity for Nuclear Security* was published as IAEA Nuclear Security Series No. 31-G.

Capacity building

103. The Agency convened a side event focused on capacity-building at the General Conference, in September 2018. This side event attracted around 100 participants. In addition, the Agency convened a Technical Meeting on Leadership Development for Nuclear Security, in September 2018, which attracted 12 participants from 10 Member States.

Training programmes

104. In the reporting period, more than 2000 participants from 145 States took part in 101 training activities, and 1516 users from 140 States completed 4236 e-learning modules. Nuclear security e-learning modules accounted for 52 percent of Agency e-learning enrolments during the reporting period on the IAEA open e-learning platform. In the reporting period, two new modules entitled Security of Nuclear Information and Conducting Computer Security Assurance Activities were developed and are now available on the IAEA open e-learning platform.

105. The Agency continues to devote additional resources to the development of e-learning courses to make training more readily available. Since the conception of the e-learning project, over 12 800 Agency nuclear security e-learning modules have been completed by over 5000 users from 159 States. The e-learning module 'Overview of Nuclear Security Threats and Risks' was translated into all official languages of the IAEA during the reporting period.

106. To assist States in better identifying their human resource development needs and to promote the systematic approach to training (SAT), the Agency conducted two regional workshops in support of human resource development in nuclear security for Latin America and the Caribbean in Santiago, in August 2018 and for Europe in St Petersburg, Russian Federation, in October 2018. More broadly, the SAT methodology continued to be further implemented in developing, revising, evaluating and improving Agency training courses.

Nuclear security education

107. 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 184 institutions from 64 States. During the reporting period, INSEN members initiated the revision of teaching materials on nuclear security that were developed based on the ongoing revision of *Educational Programme in Nuclear Security* (IAEA Nuclear Security Series No. 12). Over 80 per cent of members offer modules, courses or degree programmes in nuclear security, using largely INSEN-developed teaching materials. INSEN and the NSSC Network continued to collaborate with their members to promote human resource development good practices and to share information, expertise and resources. The INSEN annual meeting was held in Vienna, in July 2018.

108. The Agency continued to support graduate education programmes in nuclear security by providing fellowships to 14 students from 11 developing Member States to attend the masters degree programme in nuclear security at the University of National and World Economy in Bulgaria and the online masters programme in nuclear security at the Brandenburg University of Applied Sciences in Germany.

109. The ninth joint International School on Nuclear Security took place at the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy, in March-April 2019, with 52 participants from 47 Member States attending. The Agency offers regional schools on a regular basis to meet the high demand for the School. The Regional School on Nuclear Security for Asia and the Pacific was held in Jakarta, in October 2018.

Nuclear security support centres

110. The Agency continues to respond to State requests for assistance with the 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.

111. 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 61 Member States. Over the past year, NSSC Network members have held 243 training courses, workshops, and other events to build capacity in nuclear security. Of these, 42 were implemented by or in cooperation with the Agency.

112. During the reporting period, the Agency concluded a Collaborating Centre Agreement with the Explosive Ordinance Disposal and Chemical, Biological, Radiological and Nuclear Defence Training Centre (CADEX-NRBQ) in Madrid. The centre will develop new training curricula to increase the competence and skills of law enforcement personnel in the area of response to nuclear security events and provide assistance to the Agency's training programme, and in the development of nuclear security guidance documents.

113. The Agency worked together with the NSSC Network to implement a more systematic and structured plan of activities to support the Network members including a new programme of technical exchange visits among centres. This plan of activities relied on the use of new network information management tools on NUSEC and a revised TECDOC on the establishment and operation of an NSSC. The annual meeting of the NSSC Network was held in Beijing, in March 2019.

B.5.3. Coordinating Nuclear Security Guidance and Advice services

114. The Nuclear Security Guidance Committee (NSGC) met once in Vienna, in December 2018. The NSGC approved one guide for publication in the IAEA Nuclear Security Series and one draft publication for submission to Member States for comment. During its December meeting, the NSGC approved a plan prepared by the Secretariat to initiate a review of the IAEA Nuclear Security Series Fundamentals and Recommendations in order to determine whether there is a need to revise these publications in the near future.

115. By 30 June 2019, there were 35 publications in the IAEA Nuclear Security Series, 9 were approved for publication, and 12 others (including 3 revisions of existing IAEA Nuclear Security Series publications) were at various stages of development, in accordance with the roadmap agreed with the NSGC.

116. The Advisory Group on Nuclear Security (AdSec) met in Vienna, in November 2018 and in April 2019. The April meeting was the last meeting of AdSec's sixth term. AdSec and the International Nuclear Safety Group (INSAG) continued discussions on a proposed joint publication on safety–security interfaces, and began to develop an outline. AdSec continued to advise the Director General on nuclear security, including on the Agency's nuclear security programme.

C. Programme Management and Resources

C.1. Results-Based Management and Internal Coordination

117. The Secretariat continue to strengthen its results-based management and internal coordination for its nuclear security programme.

118. The results-based approach continues to be applied in the development, implementation and reporting of nuclear security activities in accordance with the Agency's established practice. The

approach is focussed on achieving results, improving performance and integrating lessons learned into management decisions.

119. In setting out an approach to address the nuclear security aspects of radiation sources delivered through the Technical Cooperation, opportunities are sought to provide support, which can be provided through the nuclear security programmes implemented by the Division of Nuclear Security or through relevant nuclear security activities under the relevant TC projects implemented through the TC programme by footnote-a funding, and funded from the Nuclear Security Fund or other extra-budgetary resources. The latter approach considered as part of the TC project design is chosen in consultation with and based on the agreement by the national counterpart.

120. The participation of the Division of Nuclear Security in the Nuclear Power Support Group ensures better coordination of nuclear security assistance by integrating the needs of nuclear security aspects in planning assistance to Member States Embarking on Nuclear Power programme. The Division of Nuclear Security also participates in Integrated Nuclear Infrastructure Review (INIR) and provides preliminary assessments of the security infrastructure.

121. During the reporting period, the Office of Internal Oversight Services carried out an Evaluation of the Agency's work related to the nuclear security of materials outside of regulatory control (MORC). The report presented a number of recommendations that will complement existing measures towards continuous improvement in the Division of Nuclear Security. The Division of Nuclear Security has accepted all the recommendations and has begun work to implement them.

122. The Division of Nuclear Security, in coordination with Technical Cooperation, the Division of Radiation, Transport and Waste Safety, and the Office of Safety and Security Coordination, contributed to the organization and development of the first School of Nuclear and Radiological Leadership for Safety in Latin America, which included nuclear security alongside safety, in Mexico, in October and November 2018.

123. A Nuclear Security Expert participated in five imPACT review missions (Armenia, Ecuador, Guyana, Mauritius and Mexico) during the reporting period. This support included advising States in the secure use of high activity radioactive sources for medical applications, including national infrastructure, end-of-lifecycle management of disused sources and physical protection systems.

124. The Division of Nuclear Security participated in the implementation of the removal of Disused Sealed Radioactive Sources (DSRS) from Cambodia during the reporting period, in response to a request received by Technical Cooperation. The Nuclear Security Fund is funding the disposal and repatriation of the DSRS.

C.2 Resources

125. In the period 1 July 2018 to 30 June 2019, the Agency accepted pledges and received contributions to the Nuclear Security Fund from the following countries: Australia, Canada, China, Estonia, Finland, France, Italy, Japan, Republic of Korea, Netherlands, New Zealand, Norway, Russian Federation, Spain, Sweden, Switzerland, United Kingdom, United States of America and European Commission.

126. The Division of Nuclear Security's Regular Budget primarily funds staff costs to support the implementation of those activities designed to benefit the greatest number of Member States. In addition, extra-budgetary expenditure in the period from 1 July 2018 to 30 June 2019 comprised disbursements of approximately €24.1 million. Total unliquidated obligations were approximately €7.2 million as of 30 June 2019.

D. Goals and Priorities for 2019–2020

127. In the next reporting period, the Agency will continue to implement the actions called for in the Nuclear Security Plan 2018–2021 in a prioritized manner within available resources.

128. In line with the ongoing priorities identified by Member States, the following are the main nuclear security programmatic goals and priorities for 2019–2020, subject to the Nuclear Security Plan 2018-2021 and availability of resources:

- Promote further adherence to the Amendment to the CPPNM with the aim of its universalization and continue preparations for the 2021 Conference of the Parties;
- Continue preparations for the next International Conference on Nuclear Security, to be held in Vienna, in February 2020;
- Continue to strengthen the Agency’s work to assist States upon request in strengthening their nuclear security regimes, particularly with respect to capacity building and the development of regulatory frameworks, and to enhance the internal coordination at the Agency needed to accomplish this effectively;
- Improve the Agency’s communications on nuclear security; and
- Initiate a project to establish a demonstration and training facility for nuclear security at Seibersdorf.