

Board of Governors  
General Conference

GOV/2021/35-GC(65)/10

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# NUCLEAR SECURITY REPORT 2021

*Report by the Director General*





**IAEA**

*Atoms for Peace and Development*

# Board of Governors General Conference

**GOV/2021/35-GC(65)/10**

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Item 16 of the Conference's provisional agenda  
(GC(65)/1 and Add.1)

# Nuclear Security Report 2021

*Report by the Director General*

## **Summary**

This report has been produced for the sixty-fifth regular session (2021) of the General Conference in response to resolution GC(64)/RES/10. In that resolution, the General Conference requested the Director General to 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 2020–30 June 2021.

## **Recommended Action**

It is recommended that the Board of Governors take note of the Nuclear Security Report 2021.



# Nuclear Security Report 2021

*Report by the Director General*

## **A. Introduction**

1. This report has been produced for the sixty-fifth regular session of the General Conference in response to resolution GC(64)/RES/10. In operative paragraph 53 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 2020–30 June 2021.

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.<sup>1</sup> 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.<sup>2</sup> All activities continue to be undertaken with due regard to the protection of confidential information.<sup>3</sup>

3. During the period of this report, a number of Agency activities were postponed due to national and international measures taken to limit the spread of the COVID-19 pandemic. Documents GOV/INF/2021/6 and GC(64)/INF/6 provided specific updates regarding the pandemic and Agency activities in this regard. In many cases, solutions were developed to implement activities remotely. However, some meetings, workshops and training courses planned for this period needed to be postponed and will be addressed in future Nuclear Security Reports.

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<sup>1</sup> See resolution GC(64)/RES/10, paragraphs 27 and 28.

<sup>2</sup> See resolution GC(64)/RES/10, paragraph 3.

<sup>3</sup> See resolution GC(64)/RES/10, paragraph 52.



*Director General Rafael Mariano Grossi addressed the 19th Meeting of the Advisory Group on Nuclear Security. Photo: IAEA Imagebank.*

## **B. Summary**

4. The Agency plays a central role in strengthening the nuclear security framework globally and in coordinating international activities in the field of nuclear security, while avoiding duplication and overlap of such activities. During the reporting period, in support of this central role as set out in multiple General Conference resolutions, the Agency undertook a number of activities during the reporting period.

5. The Agency continued to develop international consensus guidance on nuclear security and published it as part of the IAEA Nuclear Security Series. These publications are consistent with, and complement, international nuclear security instruments, such as the Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment, the International Convention for the Suppression of Acts of Nuclear Terrorism, United Nations Security Council resolutions 1373 and 1540, and the Code of Conduct on the Safety and Security of Radioactive Sources. The IAEA Nuclear Security Series forms the basis of the Agency's nuclear security assistance to States.

6. In addition, through Integrated Nuclear Security Support Plans (INSSPs), the Agency worked together with States to review States' nuclear security regimes and identify areas where they need to be strengthened. An INSSP, tailored specifically for a State, allows the State to identify priority actions towards establishing an effective and sustainable nuclear security regime. The Agency provides targeted assistance to States, upon request, in the form of national, regional and international workshops and training courses, as well as advisory missions, technical assistance and risk-reduction activities.

7. Further, to build and maintain the framework needed for States to effectively communicate with and assist one another, the Agency undertook activities such as planning major conferences and organizing virtual Technical Meetings and webinars on nuclear security topics, worked towards the

universalization of international legal instruments relevant to nuclear security and convened virtual Information Exchange Meetings to encourage communication among organizations active in various aspects of nuclear security.

8. At the same time, the Agency continued to strengthen its work to promote workforce diversity, including gender equality and geographical diversity, in the context of its nuclear security activities. In March 2021, the Agency launched the Women in Nuclear Security Initiative to contribute to the Director General's vision of the Agency being a global voice to promote gender parity and equality in the nuclear sector.<sup>4</sup> This initiative aims to promote and strengthen the involvement of women in nuclear security worldwide and to enhance the attractiveness of nuclear security jobs and careers for women, especially the next generation. As part of this initiative, activities will be carried out to highlight the experiences and achievements of women in nuclear security, as well as the concerns and challenges that women face, with the aim of increasing awareness of the Agency's programmes on gender equality and nuclear security. The first webinar organized under this initiative, held in May 2021 and attended by over 350 participants, focused on the role of the Agency in strengthening the capacity of women in nuclear security worldwide. The Division of Nuclear Security also participates in the Agency's Marie Skłodowska-Curie Fellowship Programme, which aims to help increase the number of women in the nuclear field.



9. In line with the ongoing priorities identified by Member States, the main programmatic goals and priorities in nuclear security for the reporting period, as identified in the *Nuclear Security Report 2020* (document GC(64)/6/), were to:

- Promote further adherence to the Amendment to the CPPNM, with the aim of its universalization, and continue preparations for the Conference of the Parties to the Amendment to the CPPNM;
- Continue preparations for the International Conference on the Safe and Secure Transport of Nuclear and Radioactive Materials, to be held in December 2021;
- 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;
- Continue to develop a demonstration and training facility for nuclear security at Seibersdorf and to approach donor States through a resource mobilization plan for the establishment of the facility; and

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<sup>4</sup> See resolution GC(64)/RES/10, paragraph 49.

- In close consultation with Member States, consider strengthening international norms and guidance supporting nuclear security.

During the reporting period, the Agency recorded achievements in each of these areas. These achievements, among others, are described briefly in the following paragraphs.

10. As the period covered by the *Nuclear Security Plan 2018–2021* will end in December 2021, in March 2021, the Agency initiated consultations with Member States on the development of the *Nuclear Security Plan 2022–2025*. At the end of the reporting period, three virtual consultations had been held with Member States regarding this Plan, and consultations were ongoing at the end of the period.<sup>5</sup>

### The CPPNM and its Amendment

11. The Agency further increased its efforts to promote universal adherence to the Amendment to the CPPNM (A/CPPNM). The Agency's Division of Nuclear Security and the Office of Legal Affairs continued their joint work in this area, with outreach efforts targeted at States that are party to the CPPNM but not yet to the Amendment, as well as at those that have not yet ratified the CPPNM, including through the organization of two webinars involving more than 300 participants and a virtual international seminar.<sup>6</sup> In addition, as a follow-up to the letters sent by the Director General in January 2020, the Agency sent letters in March 2021 to States not party to the CPPNM, as well as those that are party to the CPPNM but not its Amendment, urging them to join the CPPNM and its Amendment.<sup>7</sup>

12. To mark the fifth anniversary of the entry into force of the Amendment to the CPPNM on 8 May 2021, the Director General recorded a video celebrating this milestone.<sup>8</sup> In addition, the Agency updated its relevant web pages and published an updated brochure on the Amendment to the CPPNM to improve communication with States regarding the importance of adherence to and full implementation of the CPPNM and its Amendment.

13. In parallel, the Agency intensified its efforts to assist Parties in preparing for the Conference of the Parties to the Amendment to the CPPNM by holding two virtual meetings of the Preparatory Committee, in December 2020 and February 2021, which undertook preparations for the Conference including with respect to a draft Rules of Procedure and a draft annotated agenda for the Conference were developed. Over 200 participants from more than 90 Parties to the CPPNM and its Amendment, as well as Parties to the CPPNM only, participated in the meetings. The Conference is planned to be held in March 2022.<sup>9</sup>



<sup>5</sup> See resolution GC(64)/RES/10, paragraph 5.

<sup>6</sup> See resolution GC(64)/RES/10, paragraph 10.

<sup>7</sup> See Nuclear Security Report 2020 (GOV/2020/31-GC(64)/6), paragraph 108

<sup>8</sup> The video is available online at <https://www.iaea.org/publications/documents/conventions/convention-physical-protection-nuclear-material-and-its-amendment>.

<sup>9</sup> See resolution GC(64)/RES/10, paragraph 11.

## International Conference on the Safe and Secure Transport of Nuclear and Radioactive Materials

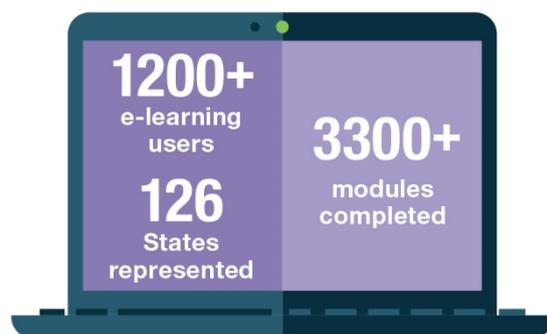
14. The Agency continued preparations for the International Conference on the Safe and Secure Transport of Nuclear and Radioactive Materials, to be held in December 2021 in Vienna. The objective of the Conference is to provide an opportunity for Member States to further develop their understanding of issues relating to transport safety and security, as well as the interfaces between these areas, to inform their work to develop or strengthen their transport safety and security regulatory infrastructures. The Conference is aimed at participants who are responsible for nuclear policy and for the technical and legal aspects of transport safety and transport security, and it is expected to be attended by officials, policymakers and operational stakeholders responsible for transport safety and transport security, as well as experts and representatives from industry and civil society, including from non-governmental organizations and academic institutions.

### Assisting States in strengthening their nuclear security regimes

15. The Agency continued to strengthen its work to assist States, upon request, in strengthening their nuclear security regimes. During this period, many activities were converted to a virtual format, where possible. Although such efforts were initially undertaken to offset COVID-19-related travel restrictions, opportunities were found in some cases to further improve Agency activities via the use of webinars and other virtual tools, such as the use of virtual meetings and e-Learning. The use of these virtual tools is expected to continue when normal levels of international travel resume, in cases where they such tools been seen to improve the effectiveness and efficiency of Agency activities.



16. The Agency issued three new and two revisions of guidance publications in the IAEA Nuclear Security Series. More than 5400 participants from 114 States took part in 68 training activities based on the Series. In addition, more than 1200 users from 126 States completed over 3300 e-learning modules on nuclear security.<sup>10</sup> A set of training materials was developed to assist the Agency in the shift from classroom-based to virtual training.



<sup>10</sup> See resolution GC(64)/RES/10, paragraph 25.

17. Five Member States formally approved INSSPs, bringing the number of approved INSSPs to 91.<sup>11</sup> The total number of INSSPs either under implementation or finalized now stands at 112.<sup>12</sup> The Agency organized one virtual INSSP preparatory meeting.<sup>13</sup> In addition, the Agency held 39 virtual INSSP progress review meetings and 4 virtual coordination meetings for INSSP implementation.



18. The Agency also conducted two International Physical Protection Advisory Service (IPPAS) missions and provided assistance to four States hosting five major public events<sup>14</sup> in order to strengthen the implementation of nuclear security measures before and during the events. The Agency loaned hand-held detection equipment to five States and a mobile radiation portal to one State, as well as donating Agency hand-held detection equipment to one State. The Agency also procured and donated radiation detection equipment to support nuclear security response activities in four States.

19. During the reporting period, States reported 111 incidents to the ITDB. Two reported incidents involved acts of trafficking or malicious use. No incident involved high enriched uranium, plutonium or Category 1 radioactive sources.<sup>15</sup>



20. In addition, the Agency completed the removal of one high activity disused sealed radioactive source and the consolidation of nine others. At the request of Member States, the Agency continued to assist with physical protection upgrades for facilities, and physical protection upgrades were completed in three Member States, at two research reactors and one hospital with high activity radioactive sources. The Agency provided assistance related to drafting nuclear security regulations to 13 Member States, including to three Member States on regulations for physical protection of nuclear facilities and material, to three Member States on regulations for security of other radioactive material, associated facilities and activities, and to seven Member States on transport security regulations.<sup>16 17</sup>

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<sup>11</sup> Two INSSP approvals, for Cyprus in September 2019 and for North Macedonia in December 2019, were incorrectly marked as ‘awaiting finalization’ in the *Nuclear Security Report 2020* (document GC(64)/6), rather than as ‘approved’, bringing the total number of approved INSSPs to 86 at the start of the reporting period.

<sup>12</sup> In total, 114 INSSPs were under implementation or finalized as of the start of the reporting period. Two INSSPs previously considered to be under implementation (in the drafting phase) were recategorized as ‘to be developed’, as no progress had been made for a number of years.

<sup>13</sup> See resolution GC(64)/RES/10, paragraph 30.

<sup>14</sup> See resolution GC(64)/RES/10, paragraph 44.

<sup>15</sup> See resolution GC(64)/RES/10, paragraph 38.

<sup>16</sup> In some cases, assistance with regulations was provided in multiple areas to Member States.

<sup>17</sup> See resolution GC(64)/RES/10, paragraph 14.



### Communication on nuclear security

21. The Agency continued to increase its external communication on nuclear security, publishing 16 articles, one press release, one photo essay and three videos on the Agency’s website. Nuclear security was also mentioned in many articles not primarily focused on nuclear security. The Agency also increased its nuclear security-related communications and outreach through social media platforms. In addition, a revised brochure was published on the CPPNM and its Amendment, to increase awareness of this treaty and its provisions.<sup>18</sup>

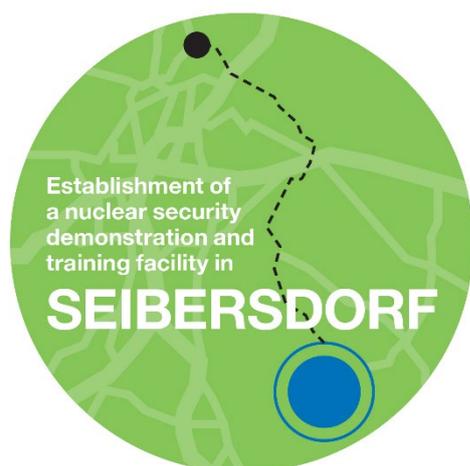


### Establishment of a training and demonstration facility in Seibersdorf

22. The Agency continued to prepare for the establishment of a training and demonstration facility in Seibersdorf, Austria. Once completed, this specialized training facility will be used for the

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<sup>18</sup> See resolution GC(64)/RES/10, paragraph 16.



demonstration of equipment and technologies related to nuclear security and the organization of training activities on the implementation of nuclear security systems and measures. The facility will be available for use by all parts of the Agency for events, as needed, and will also serve as a meeting and briefing point for the Agency's external visitors, trainees and fellows. The facility will complement the activities of national Nuclear Security Support Centres.

23. During the reporting period, the Agency completed a feasibility study and gap analysis for the technical scope of the facility and initiated the detailed project planning and definition of the requirements for the equipment laboratories. The training and demonstration facility is being developed with an emphasis on applying the key concepts set out in *Establishing and Operating a National Nuclear Security Support Centre* (IAEA-TDL-010) to help ensure that equipment, staffing and other resources are developed sustainably and used efficiently. Two Member State briefings were convened virtually to provide updates on the progress of the planning for the facility.

24. The Agency also finalized the multi-purpose building design and floor layout, and identified through a tender process the building construction company for the facility.

### **Strengthening international norms and guidance supporting nuclear security**

25. The Agency continued its support to strengthen international norms supporting nuclear security, through its activities that support States in joining relevant legally binding international agreements and implementing obligations under them, such as the CPPNM and its Amendment, the International Convention for the Suppression of Acts of Nuclear Terrorism and United Nations Security Council Resolution 1540, as well as through activities that support States in implementing the provisions of non-legally binding instruments such as the Code of Conduct on the Safety and Security of Radioactive Sources and the Code's supplementary Guidance on the Import and Export of Radioactive Sources and Guidance on the Management of Disused Radioactive Sources.

26. A number of outreach events were organized as cooperative efforts between the Division of Nuclear Security and the Office of Legal Affairs. The Agency also participated in events organized by other international organizations.

27. Furthermore, to ensure that the Nuclear Security Series publications remain up to date, the Agency continued its review of the Nuclear Security Recommendations with the goal of determining whether these publications should be updated in the near future.

## **C. Major Achievements**

### **C.1. Information Management**

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



*IAEA Staff discusses education and training in computer security for Member States. Photo credit: S. Bolt/IAEA.*

### **C.1.1. Assessing Nuclear Security Needs and Priorities**

#### **Integrated Nuclear Security Support Plans<sup>19</sup>**

29. The Agency continues to give high priority to the development and implementation of 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.

30. Five Member States, Antigua and Barbuda, Costa Rica, Djibouti, the Lao People's Democratic Republic and Poland, formally approved their INSSPs, bringing the total number of approved INSSPs to 91.<sup>20</sup> As of 30 June 2021, there were 15 INSSPs awaiting Member State acceptance and 6 INSSPs<sup>21</sup> in the initial drafting stage. The Agency held 39 virtual INSSP progress review meetings; 4 virtual coordination meetings for INSSP implementation, for Egypt, Iraq, Lebanon, and Singapore.

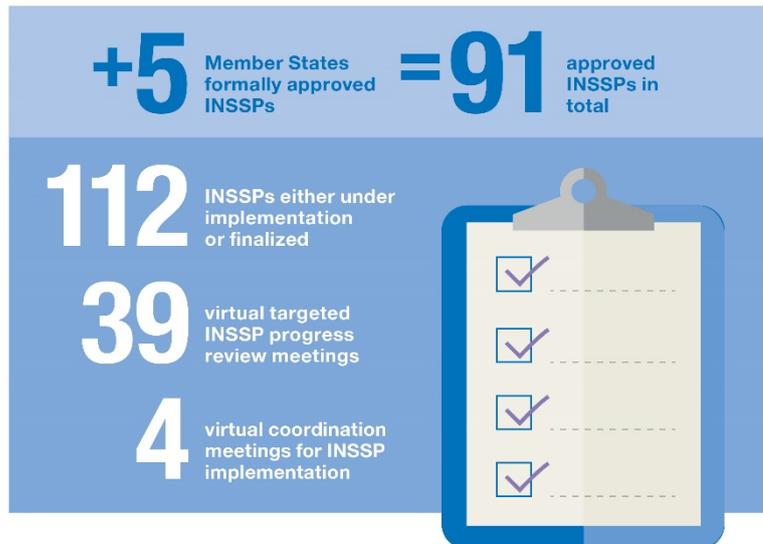
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<sup>19</sup> See resolution GC(64)/RES/10, paragraph 30.

<sup>20</sup> Two INSSP approvals, for Cyprus in September 2019 and for North Macedonia in December 2019, were not recorded in the *Nuclear Security Report 2020* (document GC(64)/6), which brings the total of approved INSSPs to 86 at the start of the reporting period.

<sup>21</sup> At the beginning of the reporting period, seven INSSPs were considered to be in the initial drafting phase. Two INSSPs previously considered to be in the initial drafting phase were recategorized as 'to be developed', as no progress had been made for a number of years, and one INSSP was recategorized from 'to be developed' to 'in drafting'.

31. A virtual briefing for INSSP points of contact, with 135 participants from 64 States and 5 international and non-governmental organizations, was held in October 2020. In addition, a virtual INSSP preparatory meeting was held for Guyana in June 2021. The objective of a virtual preparatory INSSP meeting is to prepare for the INSSP finalization or review meeting by engaging with the INSSP Point of Contact and other relevant national stakeholders.



32. Efforts continued to better align the Nuclear Security Information Management System self-assessment tool, addressed below, with the INSSP structure. A road map for these improvements was developed in the second half of 2020, and a cross-Sectional task force was established early 2021 to implement this road map.

### Nuclear Security Information Management System

33. The Agency continued to maintain and update the Nuclear Security Information Management System (NUSIMS), a web-based platform that includes a tool for States to perform nuclear security self-assessments on a voluntary basis.<sup>22</sup> Ninety-nine Member States have nominated points of contact for NUSIMS. NUSIMS self-assessment questionnaires were systematically used in INSSP finalization and review meetings. In addition, the Agency continued to actively work to promote the completion of NUSIMS self-assessment surveys prior to and in preparation for INSSP meetings. A new feature for the NUSIMS country status pages was developed, with the aim of enabling States that receive nuclear security assistance through the INSSP to account for progress made in implementing nuclear security activities. Using this new feature, States and Agency INSSP Officers can record achievements made in between INSSP finalization or review missions, providing a strategic view of progress achieved towards the States' objectives.<sup>23</sup>



### C.1.2. Information Sharing

#### Incident and Trafficking Database<sup>24</sup>

34. In the period between the inception of the ITDB and 30 June 2021, States had reported — or otherwise confirmed to the ITDB — a total of 3878 incidents. Reports of 111 incidents were added to the database in the reporting period. Of these incidents, 77 occurred between 1 July 2020 and 30 June 2021. The number of incidents voluntarily reported by participating States to the ITDB demonstrates

<sup>22</sup> See resolution GC(64)/RES/10, paragraph 50.

<sup>23</sup> The use of the Country Status pages will remain at the discretion of the concerned State and will be viewable by that State and Agency staff only, as approved by the concerned State.

<sup>24</sup> See resolution GC(64)/RES/10, paragraph 38.

that illicit trafficking, thefts, losses and other unauthorized activities and events involving nuclear and other radioactive material continue to occur at previous levels.

35. Of the 111 newly reported incidents, 2 were related to trafficking, one of which involved a scam. All of the material involved in these incidents was seized by the relevant competent authorities within the reporting State. No incidents involved high enriched uranium, plutonium or Category 1 sources. There were 19 reported incidents in which the intent to conduct trafficking or malicious use could not be determined. These included 15 thefts, 3 incidents of missing materials and 1 unauthorized possession. In 17 of the 19 incidents, the materials were not recovered (at the time of reporting). In all of these 17 incidents, the unrecovered materials involved lower-risk sources below Category 3.

36. There were also 90 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 shipments, unauthorized or undeclared storage, unauthorized disposal, thefts and loss of material.

37. The number of incidents related to trafficking or malicious use has declined slightly over recent years. Incidents that involved kilogram quantities of high enriched uranium were few and have not occurred since the 1990s. Some incidents involved attempts to traffic materials across international borders. Financial gain appears to be the principal incentive behind most confirmed incidents.

38. The majority of thefts involved sources in industrial or medical applications. Incidents have involved a few Category 1 sources, but Category 2 sources are regularly reported as stolen. The recovery rate for Category 1–2 sources is high, but the rate is much lower for Category 4–5 sources.

39. Most other unauthorized activities fall into one of three categories: unauthorized disposal; unauthorized shipment; and discovery of uncontrolled material. This indicates potential deficiencies in the systems used to control, secure and properly dispose of radioactive material. A growing number of incidents involved the detection of manufactured goods contaminated with radioactive material.

40. External users of the ITDB include the International Criminal Police Organization, the World Customs Organization, the European Commission (including the Directorate-General for Migration and Home Affairs, the Directorate-General for Energy and the Joint Research Centre Karlsruhe), the European Union Agency for Law Enforcement Cooperation and the Organization for Security and Co-operation in Europe.<sup>25</sup>



<sup>25</sup> A number of external users of the ITDB listed in the *Nuclear Security Report 2020* (document GC(64)/6) were removed from this list, as they had not registered a user account on NUSEC for their organization to continue accessing ITDB data after the distribution by fax was stopped in 2011.

41. During the reporting period, the Agency provided information on incident notifications to ITDB points of contact and to external users of the ITDB through the Nuclear Security Information Portal.

42. The Agency also provided quarterly ITDB analytical summary reports, an annual factsheet summarizing ITDB incidents for public information and, in response to requests from Member States, additional information services in support of one major public event.

### **Nuclear Security Information Portal**

43. 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 6400 registered users from 173 Member States and 23 international organizations and non-governmental organizations. An approximately six 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.

44. Improvements made to NUSEC in the reporting period include the creation of a calendar for tracking webinars related to nuclear security organized by the Agency and other organizations that take part in Information Exchange Meetings (see paragraph 120). The database for the International Network for Nuclear Security Training and Support Centres (NSSC Network) continued to be enhanced based on feedback from the network members. Notably, a new module of the NSSC Network database, the Library of Lessons Learned and Case Studies, was added to enable NSSC Network members to record information on case studies and lessons learned in nuclear security. By 30 June 2021, ten case studies were shared by ten institutions from eight Member States.

### **C.1.3. Information and Computer Security, and Information Technology Services<sup>26</sup>**

#### **Assistance provided to States**

45. Two series of international webinars were held during the reporting period, attracting over 1900 participants in total. The first series, held from June to September 2020, consisted of seven webinars addressing computer security for nuclear security and was intended to raise international awareness of threats of cyberattacks and to promote understanding of computer security techniques. The second series, held from January to April 2021, consisted of four webinars on enhancing computer security incident analysis at nuclear facilities.

46. In April 2021, the Agency initiated a national project with Romania on computer security regulatory inspections.



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<sup>26</sup> See resolution GC(64)/RES/10, paragraph 42.

## Coordinated research projects

47. 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 website.<sup>27 28</sup>

48. The CRP entitled "Enhancing Computer Security Incident Analysis at Nuclear Facilities" concluded in January 2021. This CRP produced a technical simulator of a hypothetical nuclear facility. This simulator permits users to explore the application of computer security measures and evaluate their performance, and to explore new approaches to the creation of realistic threat scenarios. In addition, it provides a means of developing complementary computer security measures and techniques to support prevention of, detection of and response to cyberattacks.

## C.2. Nuclear Security of Materials and Associated Facilities

49. Agency work in this subprogramme is carried out under four projects corresponding to four areas of expertise relevant to 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.



*Discussions begin at the International Physical Protection Advisory Mission in Niamey, Niger, in May 2021. (Photo credit : R. Adjoumani/ Autorité de Radioprotection, de Sûreté et Sécurité Nucléaires)*

<sup>27</sup> <https://www.iaea.org/services/coordinated-research-activities>

<sup>28</sup> See resolution GC(64)/RES/10, paragraphs 4 and 45.



### C.2.1. Nuclear Security Approaches for the Whole Nuclear Fuel Cycle

#### Guidance development

50. The Technical Guidance publication *Handbook on the Design of Physical Protection Systems for Nuclear Material and Nuclear Facilities* was issued as IAEA Nuclear Security Series No. 40-T.

#### Assistance provided to States

51. The Agency provides assistance to States, upon request, for the development and enhancement of their regulatory frameworks for nuclear security.<sup>29</sup> During the reporting period, the Agency provided support to Morocco, Rwanda and the Sudan to review and finalize their draft regulations on the physical protection of nuclear material and facilities.

52. The Agency conducted a virtual International Meeting on the Evaluation of Physical Protection Systems at Nuclear Facilities in April 2021. The Agency also conducted a virtual National Tabletop Exercise on Management of the Response to a Nuclear Security Event at Nuclear Facilities for the Democratic Republic of the Congo in March 2021.

53. The Agency, in cooperation with the Russian Federation, conducted two virtual training courses: a Regional Training Course on Control of Nuclear Material in Use, Movement and Storage in December 2020; and an International Training Course on the Establishment of a Nuclear Security Regime for Nuclear Power Programmes in June–July 2021.

54. At the request of five Member States, the Agency provided assistance with physical protection upgrades for nuclear facilities. These upgrades include specialized technical training to support the operation, maintenance and sustainability of physical protection equipment, systems and measures for detection, delay and response.



55. The Agency undertook a range of activities related to the nuclear security of small modular reactors (SMRs) during the reporting period. In particular, the Agency established a project on nuclear security of SMRs, under which CRPs will be established to share information on the design, implementation and evaluation of security systems of various SMRs and to analyse whether and how nuclear facility-related recommended requirements and guidance contained in the Nuclear Security

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<sup>29</sup> See resolution GC(64)/RES/10, paragraph 14.

Series publications can be applied to SMRs. Within these activities, the Agency also plans to develop new publications and establish training programmes, as appropriate.

### **Cross-cutting topics**

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

#### *Threat characterization and assessment*

57. The Implementing Guide *National Nuclear Security Threat Assessment, Design Basis Threats and Representative Threat Statements* was published as IAEA Nuclear Security Series No. 10-G (Rev 1).

58. 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.

59. During the reporting period, the Agency delivered one virtual regional workshop on threat assessment and DBTs for Member States in the Balkans in April 2021. The Agency also held four national workshops on this topic: one in Beirut in October 2020, and three delivered virtually, for Botswana and Romania in March 2021, and for Libya in May 2021.

#### *Nuclear security culture<sup>30</sup>*

60. The Technical Guidance publication *Enhancing Nuclear Security Culture in Organizations Associated with Nuclear and other Radioactive Material* was issued as IAEA Nuclear Security Series No. 38-T.

61. The Agency also continued its efforts to enhance States' understanding of nuclear security culture and its application in practice through a national workshop on this topic, delivered virtually for Cameroon in December 2020.

#### *Safety–security interface<sup>31</sup>*

62. During the reporting period, the Agency continued to work to develop publications addressing safety–security interfaces related to nuclear and other radioactive material under regulatory control. The Agency published *The Nuclear Safety and Nuclear Security Interface: Approaches and National Experiences* (Technical Reports Series No. 1000) in March 2021.

63. A Technical Meeting to Share Approaches to and Experiences in the Management of Regulatory Oversight for the Operation of a First Nuclear Power Plant was held virtually in June 2021. The meeting provided a platform for Member States to share good practices and challenges faced during the development and implementation of regulatory oversight activities at various stages in the life cycle of nuclear power plants.

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<sup>30</sup> See resolution GC(64)/RES/10, paragraphs 23 and 24. In paragraph 23 of GC(64)/Res/10, the Secretariat is encouraged to organize an international workshop on nuclear security culture. Unfortunately, due to the COVID 19 situation, the Agency was unable to do so in the reporting period.

<sup>31</sup> See resolution GC(64)/RES/10, paragraph 19.

## International Physical Protection Advisory Service

64. Since 1996, a total of 92 International Physical Protection Advisory Service (IPPAS) missions have been conducted, upon request, in 55 Member States. During the reporting period, IPPAS missions were conducted in the Niger in May 2021 and in Belarus in June–July 2021.



65. The Agency held virtual national IPPAS workshops for Belarus in February 2021 and for Burkina Faso and the Niger in March 2021, to provide information on the processes for preparing and conducting IPPAS missions and on the benefits of such missions.

66. The Agency completed the update of the IPPAS Good Practices Database to include 179 additional good practices identified during IPPAS missions conducted between May 2015 and December 2019. The data were generalized to remove specific references to the host country, the competent authority and the facility operator, and permission was requested from host countries to share good practices identified during missions in their countries with registered IPPAS points of contact on NUSEC.

### C.2.2. Enhancing Nuclear Material Security Using Accounting and Control

#### Assistance provided to States

67. The Division of Nuclear Security and the Office of Safeguards Analytical Services continued joint work to upgrade the nuclear security infrastructure at the Agency's Nuclear Material Laboratory in Seibersdorf, Austria, in compliance with local regulations and the recommendations contained in IAEA Nuclear Security Series No. 13.

#### Advising States on preventive and protective measures against insider threats<sup>32</sup>

68. A document preparation profile for a Technical Guidance publication provisionally entitled *The Establishment and Implementation of a Trustworthiness Programme in Nuclear Security* was approved by the Nuclear Security Guidance Committee (NSGC).

69. During the reporting period, the Agency further developed gamification, virtual reality and video-based training tools using the Shapash Nuclear Research Institute, which is a hypothetical research facility used to support Agency training on nuclear security. These new training tools allow users to deepen their understanding of the concepts taught in training courses in an interactive manner.

### C.2.3. Upgrading Security of Radioactive Material and Associated Facilities

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

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<sup>32</sup> See resolution GC(64)/RES/10, paragraph 40.

### Assistance provided to States<sup>33</sup>

71. The Agency continued its project focused on enhancing national regulatory infrastructure for radiation safety and security of radioactive material in Africa, with a total of 38 participating States. As part of this project, two virtual regional workshops on policy and strategy for the safety and security of radioactive material were held, in March 2021 for English-speaking African States and in April 2021 for French-speaking African States.

72. In addition, the Agency continued a similar project for States in Latin America and the Caribbean, with a focus on enhancing national regulatory infrastructure for both radiation safety and security of radioactive material. Fifteen States participated during the reporting period.<sup>34</sup> Two virtual regional workshops associated with this project were held: on policy and strategy of radiation safety and security of radioactive material in November-December 2020, and on strategic directions for establishing integrated management systems for regulatory bodies in March 2021.

73. During the reporting period, the Agency provided support to Benin, the Plurinational State of Bolivia and Botswana to review and finalize their draft regulations on the security of other radioactive material and associated facilities and activities.<sup>35</sup>

74. During the reporting period, six virtual workshops on basic concepts of physical protection systems for radioactive material and remote physical protection assessment of facilities involving high activity radioactive material were conducted for the Plurinational State of Bolivia, Jamaica, Mali, the Sudan, Turkmenistan and Zimbabwe.

75. The Agency held a virtual National Training Course on Regulatory Control of Safety and Security for Radiotherapy Practice for Uruguay in April 2021.

76. 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.

77. The Agency continued to assist States with the secure management of disused sources. The removal of one high activity disused sealed radioactive source from Bahrain was completed during the reporting period. Projects are ongoing in Algeria, Burkina Faso, Chile, Congo, the Dominican Republic and Nicaragua for the removal of 49 high activity disused sources, and a project is also ongoing in Colombia for the consolidation of nine high activity disused sources. Four virtual meetings were held in November 2020 to update participating States on the status of the projects.



<sup>33</sup> See resolution GC(64)/RES/10, paragraph 32.

<sup>34</sup> See resolution GC(64)/RES/10, paragraph 14.

<sup>35</sup> See resolution GC(64)/RES/10, paragraph 14.

78. As part of a project to assist Member States in strengthening the safety and security of disused radioisotope thermoelectric generators, the conditioning of four such generators has been initiated as a preventative measure to maintain radioactive source containment and ensure the devices are suitable for safe and secure long term storage.

### **Support for the Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources<sup>36</sup>**

79. As of 30 June 2021, 140 States had made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 123 had 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 145 States have nominated points of contact to facilitate the export and import of radioactive sources. In addition, 42 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.

80. The Agency also held a virtual technical briefing for Member States on the formalized process for the exchange of information regarding the Code of Conduct on the Safety and Security of Radioactive Sources in February 2021 to provide information related to the formalized process.

81. The Agency held four virtual Regional Meetings on the Implementation of the Guidance on the Management of Disused Radioactive Sources, for Europe in January 2021, for Africa in March 2021, Asia and the Pacific in April 2021, and Latin America and the Caribbean in May 2021.

## **C.2.4. Nuclear Security in the Transport of Nuclear and other Radioactive Material**

### **Assistance provided to States**

82. 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.

83. The Implementing Guide *Security of Radioactive Material in Transport* was published as IAEA Nuclear Security Series No. 9-G (Rev. 1).

84. During the reporting period, the Agency held two national workshops: a virtual workshop on transport security planning for radioactive material during transport for Cyprus in September 2020; and a hybrid workshop on planning, conducting and evaluating an exercise on security of nuclear and radioactive material in transport for Romania, held both virtually and in Sinaia, Romania in March 2021. A hybrid regional transport security tabletop exercise was also held both virtually and in Bucharest in May 2021.

85. The Agency assisted States with the development and improvement of national regulatory infrastructures related to transport security of nuclear and other radioactive material.<sup>37</sup> Seven Member States were supported remotely: Botswana, Cyprus, Mozambique, the Republic of Moldova, Sierra Leone, the United Republic of Tanzania and Zambia. In August 2020, a national workshop for the

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<sup>36</sup> See resolution GC(64)/RES/10, paragraph 34.

<sup>37</sup> See resolution GC(64)/RES/10, paragraph 14.

Islamic Republic of Iran was held in Tehran, on regulation development, and, in November 2020, virtual national workshops were held for Botswana and Sierra Leone on this topic.

86. The Agency also provided assistance to Albania and the Republic of Moldova with physical protection upgrades for the transport of radioactive material. Technical training was also provided to support the operation, maintenance and sustainability of physical protection equipment, systems and measures. In addition, in November 2020, the Agency assisted the Congo to prepare for the transport of a disused high activity radioactive source to a secure facility.



### C.3. Nuclear Security of Materials out of Regulatory Control<sup>38</sup>



*Participants search stadium seating for radioactive material during the National Workshop on Major Public Events held in Bucharest in June 2021 to support Romania in its nuclear security preparedness for EURO2021. (Photo credit: N. Tottie/IAEA)*

<sup>38</sup> The project titles listed under C.3.1 and C.3.2 have changed relative to the *Nuclear Security Plan 2018–2021*, for consistency with the project titles in *The Agency's Programme and Budget 2020–2021* (document GC(63)/2).

87. Agency work under this subprogramme is carried out under three projects: institutional response infrastructure for nuclear and other radioactive material out of regulatory control, nuclear security detection architecture, and radiological crime scene management and nuclear forensic science.

### C.3.1. Institutional Response Infrastructure for Material out of Regulatory Control

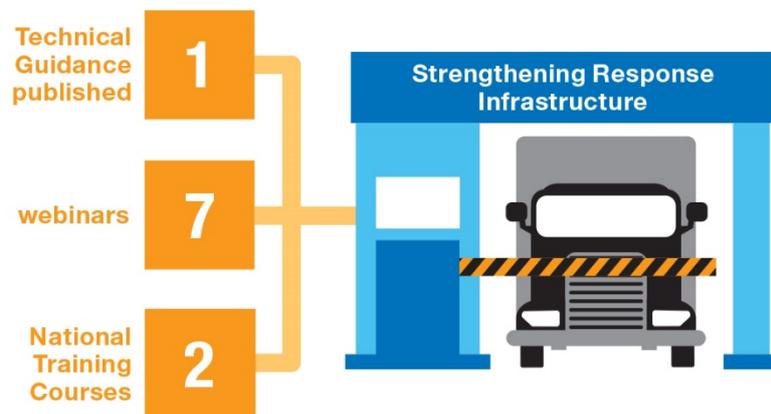
#### Guidance development

88. The Technical Guidance publication *Preparation, Conduct and Evaluation of Exercises for Detection of and Response to Acts Involving Nuclear and Other Radioactive Material out of Regulatory Control* was issued as IAEA Nuclear Security Series No. 41-T.

#### Assistance provided to States<sup>39</sup>

89. The Agency assists Member States, upon request and in coordination with Nuclear Security Support Centres (NSSCs), with nuclear security systems and measures in response to nuclear security events involving material out of regulatory control.

90. The project approach is in line with the Agency's Implementing Guides and begins with a Member State developing a road map of nuclear security response activities that the Agency can support by holding a national workshop. The Agency's assistance covers the development of national nuclear security plans for the



response to nuclear security events, the exercising of those plans, training of national law enforcement personnel in radiological crime scene management and the procurement of radiation detection equipment to support the nuclear security response. In support of this approach, the Agency held three webinars related to the guidance provided in *Developing a National Framework for Managing the Response to Nuclear Security Events* (IAEA Nuclear Security Series No. 37-G), in December 2020 and March 2021. These webinars were attended by nearly 1000 participants in total. The Agency also procured 157 items of radiation detection equipment to support nuclear security response activities in Ecuador, Egypt, the Sudan and Thailand.

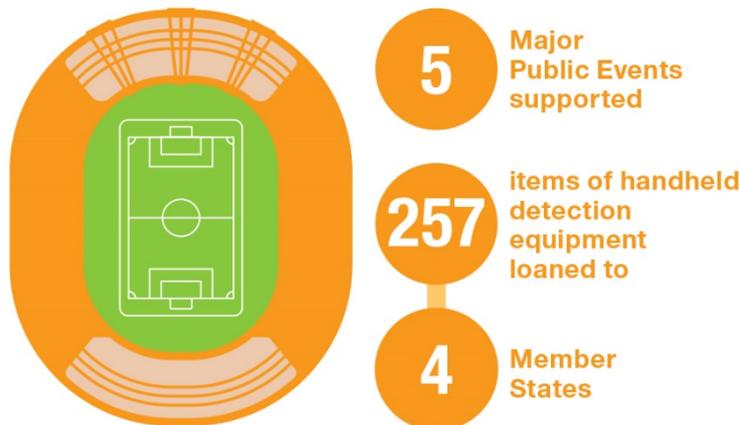
91. Under the Collaborating Centre Agreement between the Agency and Spain's Civil Guard, signed in March 2019, the Agency loaned 40 items of hand-held radiation detection equipment to the Civil Guard to support the training of Civil Guard officers in the response to nuclear security events and to support the Agency in its global nuclear security activities.

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<sup>39</sup> This section describes only assistance provided by the Agency with respect to response to nuclear security events, and does not include assistance with response to emergencies triggered by nuclear security events. The Agency's assistance in this area is described in detail in the report by the Director General on *Nuclear and Radiation Safety* (document GOV/2021-32-GC(65)/7).

## Major public events<sup>40</sup>

92. 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, workshops and training on the deployment of resources and use of detection equipment at such events. During the reporting period, the Agency assisted with preparations for the following five major public events: the 2020 African Nations Championship in Cameroon, the 2020 Commonwealth Heads of Government Meeting in Rwanda, the 2020 Association of Southeast Asian Nations Summit in Viet Nam, EURO 2021 in Romania and the 2021 Africa Cup of Nations in Cameroon.<sup>41</sup>



93. During the reporting period, the Agency held one webinar on nuclear security systems and measures for major public events, in October 2020, involving over 225 participants, and three webinars covering various topics related to the implementation of nuclear security systems and measures for major public events, in April 2021, involving over 1000 participants. Two national training courses were held: for

Rwanda, in April 2021 in Cairo (as a hybrid event) and in Bucharest in June 2021. The national training course in Bucharest was held in-person, as it was designated as a critical event.

94. The Agency collaborates with United Nations Office of Counter-Terrorism, the United Nations Interregional Crime and Justice Research Institute, and the International Centre for Sports Security within the Global Programme on Security of Major Sporting Events, and Promotion of Sport and its Values as a Tool to Prevent Violent Extremism.

95. The Agency loaned a total of 257 radiation detection instruments to 4 States for major public events. In particular, the Agency provided radiation portal monitors to upgrade radiation detection at Tan Son Nhat International Airport, Ho Chi Minh City, Viet Nam, as part of this subprogramme.

### C.3.2. Nuclear Security Detection Architecture

96. 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.

<sup>40</sup> See resolution GC(64)/RES/10, paragraph 44.

<sup>41</sup> Although some of these events had to be postponed or cancelled owing to the COVID-19 pandemic or other reasons, the Agency's assistance had already been provided during the reporting period.



### Assistance provided to States

97. The Agency assists Member States, upon request and in coordination with NSSCs, in 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 the development and sustainability of nuclear security detection architecture, including support for identifying a strategy based on threat assessment and, subsequently, for the establishment of detection operations at strategic locations.

98. In support of these activities, a webinar on nuclear security detection architecture awareness, attended by nearly 250 participants, was held in September 2020. A second webinar on nuclear security detection architecture was held in October 2020. The Agency also conducted three virtual regional workshops on this topic, for Latin America in February 2021, for Central American States in March 2021, and for Asia and the Pacific in May 2021. In addition, the Agency convened a virtual national workshop for Indonesia on expert support for the assessment of alarms and alerts for material out of regulatory control in February 2021.

99. The Agency continued to support and enhance national efforts in Latin America to establish national strategies for the detection of material out of regulatory control. Owing to the international situation related to COVID-19, a revised project implementation timeline incorporating virtual events was developed.

100. The Agency continued to provide support to Member States on the detection of nuclear and other radioactive material in urban areas by convening an international webinar on integrating nuclear security systems and measures to secure major urban areas and transportation hubs involving 64 participants in September 2020. A regional webinar on this topic for Spanish-speaking countries in Latin America, attended by 113 participants, was convened in June 2021.

101. The Agency provides a repository of hand-held detection equipment to be loaned or donated to a State to support its detection system; manages a pool of equipment for major public events and training, including operation of equipment, frontline maintenance and calibration; and performs demonstrations of new types of equipment. The Agency provided or loaned hand-held detection equipment to, and fixed radiation portal monitors for, four Member States — Cameroon, Romania, Rwanda and Viet Nam — in support of major public events, and Spain, as part of the Collaborating Centre Agreement between the Agency and Spain's Civil Guard, and held one webinar on overheads and maintenance associated with hand-held detection equipment in July 2020, attended by 78 participants.

102. In response to a request for assistance from Lebanon, the Agency arranged an assistance mission in September 2020. As part of this effort, the Agency loaned 14 items of hand-held detection equipment to Lebanon, and provided training on its use.

103. The Agency convened two international webinars under the IAEA–China Atomic Energy Authority Collaborating Centre Agreement, on estimating activity in a package using high purity germanium detectors and on the application of high purity germanium detectors for nuclear security, in December 2020, involving 80 participants from 24 Member States.<sup>42</sup>

104. In addition, to enhance the use and understanding of radiation detection instruments used for nuclear security, a webinar was convened on approaches for management of nuisance alarms from radiation portal monitors in May 2021, involving 250 participants. A webinar providing an overview of passive and active detection technologies for detection of chemical, biological, radioactive, nuclear and explosive threats and other contraband was held in January 2021, involving over 320 participants.

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

105. An international webinar on the International Nuclear Security Advisory Service (INSServ) was convened in July 2020, attended by 181 participants, and an international workshop on the INSServ guidelines was conducted virtually in June 2021 with the goal of training experts to support future INSServ missions. In addition, during the reporting period, preparations continued for the conduct of an INSServ mission to Malaysia, including via a virtual coordination meeting held in January 2021.

### **Coordinated research projects**

106. A CRP entitled “Facilitation of Safe and Secure Trade Using Nuclear Detection Technology — Detection of RN and Other Contraband” was initiated during the reporting period. The objective of the CRP is to enhance the use and sustainability of nuclear security detection systems and measures used to detect nuclear and other radioactive material out of regulatory control at points of entry and exit and other trade locations. Through the development and advancement of nuclear detection technology related methods, techniques, algorithms, software tools, specifications and technical guidance documents, nuclear detection systems will be improved and will concurrently support the facilitation of safe and secure trade. The integration of nuclear detection technologies with other technologies and data analytics will support detection of anomalies indicating the presence of other contraband materials, safety hazards and commercial fraud. The increased value of nuclear security detection systems and methods resulting from these improvements will support enhanced use and sustainability of the systems.

107. The CRP entitled “Improved Assessment of Initial Alarms from Radiation Detection Instruments”, completed in December 2019, developed a Tool for Radiation Alarm and Commodity Evaluation (TRACE), which serves as a reference for assisting in the assessment of radiation alarms. The tool is provided as a smartphone application and is available in Arabic, Chinese, English, French, Russian and Spanish, as well as in Georgian, Korean and Turkish. There are over 13 000 users of TRACE in more than 160 States.

## **C.3.3. Radiological Crime Scene Management and Nuclear Forensics Science<sup>43</sup>**

### **Guidance development**

108. A document preparation profile for a revision of the Implementing Guide *Radiological Crime Scene Management* (IAEA Nuclear Security Series No. 22-G) was approved by the NSGC.

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<sup>42</sup> See resolution GC(64)/RES/10, paragraph 43.

<sup>43</sup> See resolution GC(64)/RES/10, paragraph 43.



### Assistance provided to States

109. The Agency conducts regular training courses in radiological crime scene management based on INSSP requests and in response to direct requests received from States. One national workshop on this topic was conducted during the reporting period, in Nicosia in September 2020. In addition, two webinars related to crime scene management were held: one in September 2020, attended by over 175 participants, and another in April 2021, attended by around 100 participants.

110. 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.

111. Two webinars were convened on the conduct of nuclear forensics operations: one in October 2020, attended by over 140 participants, and another in May 2021, attended by around 170 participants.

112. The Agency encouraged international collaboration in nuclear forensics research by providing funding for the residential assignment of a Moldovan scientist and two experts from Kazakhstan at the Laboratory for Microparticle Analysis in Moscow, from November 2020 to March 2021.

113. To facilitate the provision of assistance in nuclear forensics science, the Agency signed Practical Arrangements with the Laboratory for Microparticle Analysis in Moscow in February 2021, which brought the total number of existing Practical Arrangements in the area of nuclear forensics sciences to eight.

### C.4. Programme Development and International Cooperation

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



*Group photo of participants in the joint ICTP-IAEA International School on Nuclear Security, convened virtually in April 2021. (Photo credit: M. Maffione, ICTP)*

#### **C.4.1. International Cooperation on Nuclear Security Networks and Partnerships**

##### **Promoting further adherence to international legal instruments**

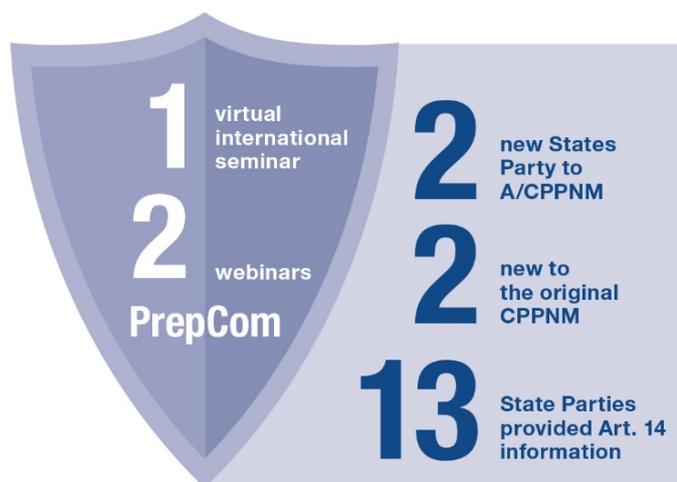
115. The Agency conducted two webinars to promote the universalization of the CPPNM and its Amendment in July 2020, attended by more than 300 participants from 81 States. In addition, one virtual international seminar to encourage adherence to the CPPNM and its Amendment focused on Russian-speaking countries and Western Asia and the Middle East was convened in May 2021. During the reporting period, two States became party to the Amendment and one became party to the original CPPNM.<sup>44 45</sup>

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<sup>44</sup> See resolution GC(64)/RES/10, paragraph 10.

<sup>45</sup> 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](http://www.legacy.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf)

116. The sixth Technical Meeting of the Representatives of States Parties to the CPPNM and its Amendment was held virtually in December 2020, attended by 154 participants from 69 Parties to the CPPNM and its Amendment and to the CPPNM only. The representatives discussed, inter alia, laws and regulations giving effect to the CPPNM and its Amendment, the role of designated Points of Contacts, and national experiences in the implementation of the CPPNM and its Amendment.<sup>46</sup>



117. Furthermore, several activities related to the universalization of the Amendment to the CPPNM included briefings delivered by the United Nations Office on Drugs and Crime on the International Convention for the Suppression of Acts of Nuclear Terrorism.

118. In December 2020 and February 2021, the Agency convened virtual meetings of the Preparatory Committee for the Conference of the Parties to the Amendment to the CPPNM. The Preparatory Committee undertook preparations for the Conference including with respect to a draft Rules of Procedure and a draft annotated agenda. Over 240 participants from more than 90 Parties to the CPPNM and its Amendment, as well as Parties to the CPPNM only, participated in the meeting.<sup>47</sup> In addition, the Secretariat continues to maintain an online repository of documents related to the CPPNM, its 2005 Amendment and relevant conferences.<sup>48</sup>

119. The Agency continued to maintain a database of designated Points of Contact for the CPPNM and its Amendment and of information on national laws and regulations giving effect to the CPPNM and its Amendment, as provided by States Parties pursuant to Articles 5 and 14 of the Convention, respectively. During the reporting period, 13 States provided information on their national laws and regulations to the Agency in accordance with Article 14.

### **Playing a central and coordinating role in nuclear security**

120. The Agency hosted two virtual Information Exchange Meetings, in October 2020 and April 2021, to coordinate activities in nuclear security and to avoid duplication in the activities undertaken by various relevant organizations. More than 20 participants from 11 organizations and initiatives exchanged information, discussed various themes within nuclear security and gained a better understanding of activities being undertaken by each organization, particularly including experiences related to conducting activities under COVID-19-related restrictions.<sup>49</sup>

121. The Agency continued preparations for the International Conference on the Safe and Secure Transport of Nuclear and Radioactive Materials, to be held in December 2021 in Vienna. The objective of the Conference is to provide an opportunity for Member States to further develop their understanding of issues relating to transport safety and transport security, as well as the interfaces between these areas,

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<sup>46</sup> See resolution GC(64)/RES/10, paragraph 10.

<sup>47</sup> See resolution GC(64)/RES/10, paragraph 11.

<sup>48</sup> See resolution GC(64)/RES/10, paragraph 12.

<sup>49</sup> See resolution GC(64)/RES/10, paragraph 22.

to inform their work to develop or strengthen their transport safety and transport security regulatory infrastructures. The Conference is aimed at participants who are responsible for nuclear policy and for the technical and legal aspects of transport safety and transport security, and it is expected to be attended by officials, policymakers and operational stakeholders responsible for transport safety and transport security, as well as experts and representatives from industry and civil society, including from non-governmental organizations and academic institutions.

122. The first and second meetings of the Programme Committee for the International Conference on the Safety and Security of Radioactive Sources: Accomplishments and Future Endeavours were convened virtually in December 2020 and April 2021. This Conference will be held in Vienna in June 2022.

#### C.4.2. Education and Training Programmes for Human Resource Development

##### Training programmes<sup>50</sup>

123. The Agency develops education and training programmes for human resource development and coordinates the development and maintenance of a suite of training courses based on Agency nuclear security guidance. The Agency also supports the establishment of nuclear security training programmes and training organizations, such as NSSCs. During the reporting period, the majority of the Agency's education and training activities were undertaken virtually.

124. In the reporting period, more than 5400 participants from 114 States took part in 68 training activities, and over 1200 users from 126 States completed over 3300 e-learning modules. Nuclear security e-learning modules accounted for 18 per cent of Agency e-learning enrolments during the reporting period on the Agency's open e-learning platform.



125. The Agency continues to devote additional resources to

the development, translation, revision and maintenance of e-learning courses to make training more readily available. Since the conception of the e-learning project, around 23 000 Agency nuclear security e-learning modules have been completed by around 9900 users from 175 States. Over 58 000 learning hours have been completed. Seventeen e-learning modules were translated and made available in Arabic, Chinese, English, French, Russian and Spanish during the reporting period, and one new module entitled “International Legal Framework for Nuclear Security” was developed, bringing the total number of e-learning modules to 18.

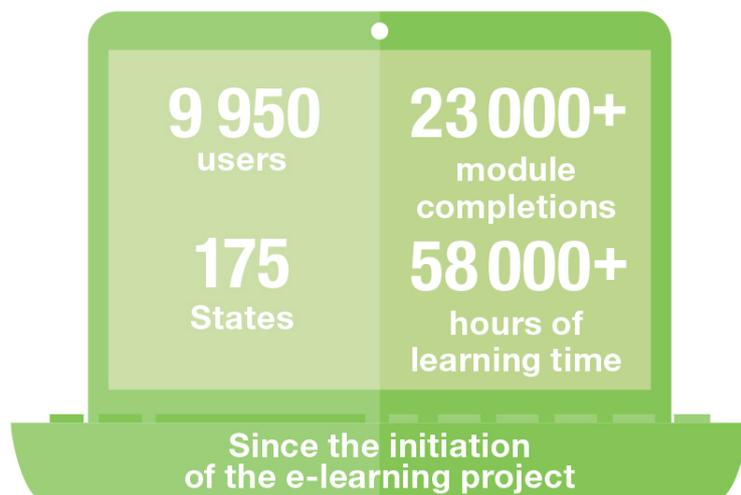
126. Working in collaboration with Member State experts and using information from INSSPs and NUSIMS, the Agency regularly identifies areas where new and updated training courses are needed. During the reporting period, more than 80 items in the Nuclear Security Training Catalogue were

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<sup>50</sup> See resolution GC(64)/RES/10, paragraph 25.

reviewed, training materials for 30 courses and workshops were updated and revised, and training materials for 9 new courses or workshops were developed.

127. The main focus of the Agency's nuclear security training activities during the reporting period was on harmonizing the training provided to States, particularly regarding addressing gaps and redundancies in training. Training procedures and guidelines, a glossary of training-related terms and self-assessment tools were developed to analyse and strengthen the management of Agency training programmes and continue to ensure their quality and relevance in meeting States' needs.



128. A set of training materials for the shift from classroom-based to virtual training was developed during the reporting period, with the aim of providing Agency staff with the key skills needed to facilitate training in a virtual environment. The training materials also address the design of virtual training, by converting existing in-person courses or through the design of new courses. In this connection, the Agency conducted training on the use of the Cyber Learning Platform for

Network Education and Training to better support new education and training needs, particularly related to the design, development and delivery of virtual and hybrid learning events.

129. During the reporting period, feedback summaries received regarding the Agency's training courses, workshops, schools and webinars were collected and analysed. The initial analysis of this feedback shows that participants highly appreciate the content and quality of training materials; the experience and teaching skills of instructors, lecturers and facilitators; and the overall implementation of training events. Evaluations typically rate the quality of the Agency's nuclear security training events as between 'good' and 'excellent'.

130. To assist States in better identifying their human resource development needs, to establish human resource development plans for nuclear security and to promote a systematic approach to training (SAT), the Agency developed an e-learning course on the SAT as a prerequisite for workshops on this topic. More broadly, the SAT methodology continued to be further implemented in developing, revising, evaluating and improving Agency training courses.

### **Nuclear security education<sup>51</sup>**

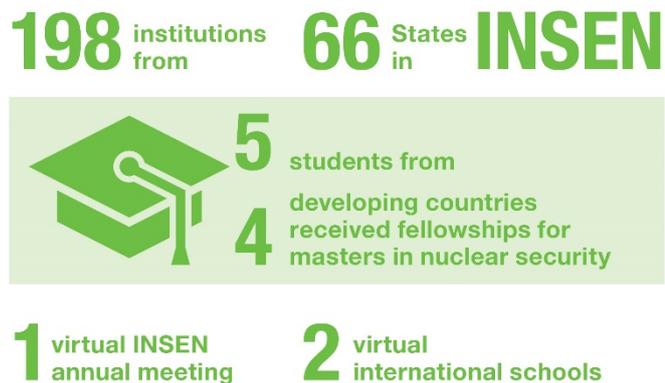
131. The International Nuclear Security Education Network (INSEN) continues to assist its member institutions and States in establishing and enhancing educational programmes on nuclear security based on international guidance and recommendations. The Network now has 198 institutions from 66 States. Over 80 per cent of members offer nuclear security programmes, which range from short courses to full Master of Science degrees, using largely INSEN-developed teaching materials. INSEN and the NSSC

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<sup>51</sup> See resolution GC(64)/RES/10, paragraph 26.

Network continued to collaborate with their members to promote human resource development good practices and to share information, expertise and resources.

132. The INSEN annual meeting, marking the tenth anniversary of INSEN, was held virtually in July 2020. The 2021 International Nuclear Security Education Network Leadership Meeting was held virtually in March 2021, at which INSEN's ongoing activities and the impact of COVID-19 on nuclear security education were discussed. The INSEN secretariat also conducted an education impact assessment survey during the reporting period.



133. The Agency continued to support graduate education programmes in nuclear security by providing fellowships to five students from four developing Member States to attend the master's degree programme in nuclear security at the University of National and World Economy in Bulgaria.

134. During the reporting period, the Agency updated the International School on Nuclear Security curriculum to adapt it to a virtual format. Two International Schools on Nuclear Security were held virtually during the reporting period: in Russian in September 2020 and May–June 2021, with 23 participants from 8 Member States; and in English in April 2021, with 52 participants from 36 Member States. During the reporting period, the tenth anniversary of the Joint International School on Nuclear Security, organized by the Agency and the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy, was celebrated. Since the first Joint International School in 2011, such Schools have benefited around 500 young professionals from around the world.

### Nuclear Security Support Centres<sup>52</sup>

135. The Agency continues to respond to State requests for assistance with the development of national 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.

136. 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 66 Member States. A webinar was held in September 2020 on the recently issued publication *Establishing and Operating a National Nuclear Security Support Centre*. The 2021 Annual Meeting of the NSSC Network was convened virtually in April 2021.

137. In order to better understand the impact of COVID-19 on the role and functions of NSSCs and to share related good practices, a working group of the NSSC Network conducted a survey of Network members. The responses showed that all NSSC core functions had been impacted, including by the cancellation and postponement of events and activities.



<sup>52</sup> See resolution GC(64)/RES/10, paragraph 26.

However, new and unique approaches to conducting virtual activities have also been developed. NSSCs reported that the mitigating actions already implemented had been incorporated in their mid-term strategies.

138. The Agency continued to work together with the NSSC Network to implement a systematic and structured plan of activities to support the Network's members.

### C.4.3. Coordinating Nuclear Security Guidance and Advice Services



139. The NSGC met virtually in July 2020, November 2020 and June 2021, and started its fourth three-year term in 2021. The NSGC approved four document preparation profiles for drafts in the IAEA Nuclear Security Series, and one draft for publication.

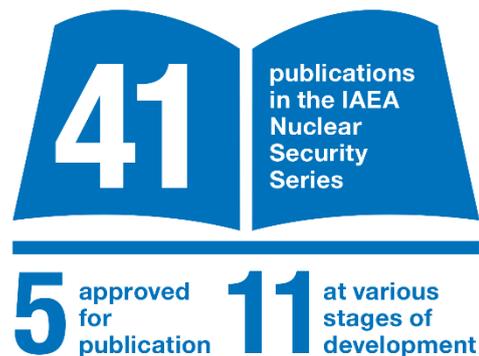
140. Working with Member States via the NSGC, the review of the IAEA Nuclear Security Series Fundamentals and Recommendations to determine whether there is a need to revise these publications in the near future was completed in

December 2020. As part of this review, a virtual process, including several meetings and exchanges of information, for the conduct of a second Open-ended Meeting of Legal and Technical Experts on IAEA Nuclear Security Series No. 13 and INFCIRC/225 Rev 5 was held from July to November 2020, involving over 100 participants from 60 Member States.

141. In order to better understand Member State use of the IAEA Nuclear Security Series, results from a survey on the use of the Nuclear Security Series, distributed to Member States in January 2020, were analysed and a summary report was prepared. The final report from the survey was presented to the NSGC in June 2021.<sup>53</sup>

142. By 30 June 2021, there were 41 publications in the IAEA Nuclear Security Series, 5 were approved for publication, and 11 others were at various stages of development, in accordance with the road map agreed with the NSGC. Delays in the publication process were again discussed at the NSGC meetings in December 2020 and June 2021. The issue was also mentioned in the Chair's report of the NSGC's 18th meeting.<sup>54</sup>

143. The Advisory Group on Nuclear Security (AdSec) met virtually in November 2020 and April 2021. The meetings of AdSec and the International Nuclear Safety Group (INSAG) in 2020 and 2021 included discussions on a joint publication regarding the safety and security interface. A draft publication continues to be developed jointly by INSAG and AdSec. AdSec continued to advise the Director General on nuclear security matters, including on the Agency's nuclear security programme.



<sup>53</sup> See resolution GC(64)/RES/10, paragraph 17.

<sup>54</sup> See resolution GC(64)/RES/10, paragraph 18.

## **D. Programme Management and Resources**

### **D.1. Results Based Management and Internal Coordination<sup>55</sup>**

144. The Secretariat continues to strengthen its results based management and internal coordination for its nuclear security programme.

145. The results based approach is applied in the development, implementation and reporting of nuclear security activities in accordance with the Agency's established practice. The approach is focused on achieving results, improving performance and integrating lessons learned into management decisions. In parallel, the Secretariat continued to further develop, in close consultation with Member States, a voluntary mechanism to match Member States' requests for assistance with other Member States' offers of assistance, with due regard for the confidentiality of information relevant to nuclear security.<sup>56</sup>

146. Strengthened internal coordination on agreed activities and projects, including those set out in INSSPs, has been used to improve the effectiveness and efficiency of the management of the Nuclear Security Fund (NSF). Strengthened internal coordination also provides opportunities to identify and eliminate potential conflicts between guidance and assistance provided by different parts of the Agency. During the reporting period, the Division of Nuclear Security, which has the primary responsibility within the Agency for activities relevant to nuclear security, worked to increase coordination with other Divisions and Departments on activities related to nuclear security as well as to increase the number of jointly organized activities involving nuclear security, where appropriate.

147. During the reporting period, a number of efforts focused on the security of radioactive sources. Opportunities were sought to provide support in addressing the nuclear security aspects of radiation sources delivered through the technical cooperation (TC) programme. This support can be provided through the nuclear security programmes implemented by the Division of Nuclear Security or through nuclear security activities under the relevant projects implemented through the TC programme by footnote-a/ funding, and funded from the NSF or other extrabudgetary resources.<sup>57</sup> 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.

148. Additional activities in this area were undertaken in coordination and cooperation not only with the Department of Technical Cooperation, but also with other relevant Divisions and Departments, notably the Division of Radiation, Transport and Waste Safety, the Division of Nuclear Installation Safety, the Incident and Emergency Centre and the Office of Safety and Security Coordination in the Department of Nuclear Safety and Security; the Division of Nuclear Fuel Cycle and Waste Technology in the Department of Nuclear Energy; the Division of Physical and Chemical Sciences in the Department of Nuclear Sciences and Applications; and the Office of Legal Affairs. Several of these activities are highlighted in the following paragraphs.

149. The Division of Nuclear Security, in close coordination with the Department of Technical Cooperation, continued work on regulatory infrastructure development projects in Africa and Latin America with the Division of Radiation, Transport and Waste Safety, to support States in building strong regulatory infrastructures for nuclear security (see paragraphs 71 and 72).

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<sup>55</sup> See resolution GC(64)/RES/10, paragraph 48.

<sup>56</sup> See resolution GC(64)/RES/10, paragraph 31.

<sup>57</sup> Unfunded elements of the TC programme, where projects or project components have been approved but resources are not sufficient to implement them, are referred to as footnote-a/ projects and components.

150. In addition, nuclear security experts from the Division of Nuclear Security participated in five virtual imPACT Review missions, for the Central African Republic, the Democratic Republic of the Congo, Mali, Nepal and Senegal. This support included advising States in the secure use of high activity radioactive sources for medical applications, including with regard to national infrastructure, end of life management of disused sources and physical protection systems. Nuclear security experts also participated in the Integrated Nuclear Infrastructure Review (INIR) mission in Uzbekistan in May–June 2021.

151. The Agency continued a nuclear security project to support the safe and secure storage of radioisotope thermoelectric generators, organized by the Division of Nuclear Security in close coordination with Department of Technical Cooperation and in cooperation with the Division of Radiation, Transport and Waste Safety as well as the Department of Nuclear Energy's Division of Nuclear Fuel Cycle and Waste Technology (see paragraph 78).

152. The Division of Nuclear Security continues to undertake a coordinated approach to ensure that the security of radioactive sources during transport is included in a range of Agency projects, working closely with the Department of Technical Cooperation and the Division of Radiation, Transport and Waste Safety. During the reporting period, the Division of Nuclear Security and the Department of Technical Cooperation provided assistance to the Congo for the secure transport of a disused radioactive source and also for the secure interim storage of this source and another high activity disused radioactive source (see paragraph 86).

153. In addition to the coordination and cooperation in the nuclear security of radioactive sources, a virtual Technical Meeting was jointly organized with the Division of Nuclear Installation Safety in June 2021 on Member States' approaches to and experiences with the management of regulatory oversight for the operation of a first nuclear power plant (see paragraph 63).

154. There was also significant cooperation in the detection of nuclear and radioactive material out of regulatory control. The Division of Nuclear Security participated actively in two virtual international conferences convened by other Divisions and Departments during the reporting period: the International Conference on the Management of Naturally Occurring Radioactive Materials (NORM) in Industry, held in October 2020 and organized jointly by the Division of Nuclear Fuel Cycle and Waste Technology and the Division of Radiation, Transport and Waste Safety; and the International Conference on Radiation Safety: Improving Radiation Protection in Practice, held in November 2020 and organized by the Division of Nuclear Fuel Cycle and Waste Technology.

155. The Division of Nuclear Security and the Division of Physical and Chemical Sciences also jointly offered several webinars addressing the enhanced use and understanding of radiation detection equipment used for nuclear security, radiation safety, safeguards and environmental measurements. Finally, the Division of Nuclear Security coordinated with the Division of Radiation, Transport and Waste Safety to provide a module in a webinar on passive and active detection technologies for detection of chemical, biological, radiological, nuclear and explosive threats and other contraband in January 2021 (see paragraph 105).

156. The Division of Nuclear Security coordinates with the Agency's Incident and Emergency Centre on matters of response to nuclear or radiological emergencies, including by jointly offering two webinars in April 2021 on capacity building and major public events, and three webinars in December 2020 and March 2021 on response to nuclear security events. In addition, a joint virtual coordination meeting with Cameroon, on major public events, and a joint virtual mission for Egypt, on response to nuclear security events, were held in March 2021. Furthermore, experts from the Division of Nuclear Security supported the Agency's Incident and Emergency System by taking part in its on-call system and participating actively in related training activities and exercises.

157. The Division of Nuclear Security participated in the Agency assistance mission to Lebanon in September 2020 (see paragraph 103), by loaning 14 items of hand-held detection equipment in connection with this mission, and providing training on its use.

158. Coordination also continued within the Department of Nuclear Safety and Security on development of relevant publications. The Interface Group, which gathers together chairs of the Safety Standards Committees and the Nuclear Security Guidance Committee, reviewed three publication proposals for possible safety–security interfaces following a recommendation from the Secretariat’s Coordination Committee on Safety Standards and Nuclear Security Series Publications. During the reporting period, the NSGC reviewed drafts of 13 safety standards identified as having interfaces with security, and relevant Safety Standards Committees reviewed two proposals for draft Nuclear Security Series publications having interfaces with safety.<sup>58</sup> In addition, the Agency published *The Nuclear Safety and Nuclear Security Interface: Approaches and National Experiences* (Technical Report Series No. 1000), reflecting the recommendations and the discussions from a Technical Meeting on this subject held in October 2018 (see paragraph 62).<sup>59</sup>

159. Training, particularly in a virtual environment, was also a focus of intra-Agency cooperation during the reporting period. The Agency undertook an initiative for developing a methodology for the use of innovative learning and training methods in coordination and collaboration with the Department of Safeguards.

160. Extrabudgetary funding from the NSF was used to support the recruitment of a Legal Officer in the Office of Legal Affairs who will provide legal expertise to the Division of Nuclear Security for activities related to the universalization of the Amendment to the CPPNM as well as INSSP missions and related events. Extrabudgetary funding from the NSF was also used to support the recruitment of an Editor in the Division of Conference and Document Services of the Department of Management to focus primarily on the editing of Nuclear Security Series publications; a Project Manager in the Office of Legal Affairs working on the organization of the 2022 International Conference on Nuclear Law; and two staff members, a Senior Radiation Specialist and a Project Management Specialist, in the Division of Radiation, Transport and Waste Safety.

161. The participation of the Division of Nuclear Security in the Nuclear Power Support Group ensures better coordination of nuclear security assistance by integrating nuclear security aspects in planning assistance to Member States embarking on nuclear power programmes. The Division participates in INIR missions and provides preliminary assessments of security infrastructure. Similarly, it participates in the Agency’s Safeguards by Design Working Group.

162. The Division of Nuclear Security also participates actively in the SMR Regulators’ Forum, the Department of Nuclear Safety and Security Working Group on SMR Safety, and the Department of Nuclear Safety and Security–Department of Nuclear Energy Joint Working Group on SMRs. In addition, the Division of Nuclear Security is contributing to the development of a report on SMR safety, security and safeguards by design.

## D.2 Resources

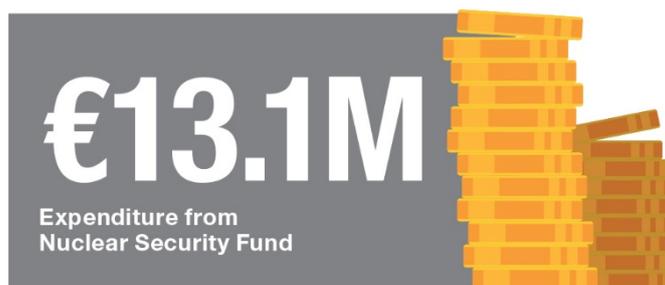
163. In the period 1 July 2020 to 30 June 2021, the Agency accepted pledges and received contributions to the NSF from the following Member States: Canada, China, Estonia, Finland, France,

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<sup>58</sup> See resolution GC(64)/RES/10, paragraph 19.

<sup>59</sup> See resolution GC(64)/RES/10, paragraph 19.

Germany, Japan, the Republic of Korea, Norway, the Russian Federation, Spain, Sweden, Switzerland, the United Kingdom and the United States of America, as well as other contributors.



164. The Division of Nuclear Security's Regular Budget primarily funds staff costs to support the implementation of activities designed to benefit the greatest number of Member States. In addition, extrabudgetary expenditure in the period from 1 July 2020 to 30 June 2021 comprised disbursements of approximately €13.1 million. Total unliquidated obligations were approximately €5.5 million as of 30 June 2021.

165. The total balance for the NSF in *The Agency's Financial Statements for 2020* was €102.8 million<sup>60</sup>, an increase from the €88.3 million reported in 2019<sup>61</sup>. This total primarily consists of active NSF contributions in various stages of implementation and funds available for implementing a wide range of activities that support the implementation of the *Nuclear Security Plan 2018–2021*.

166. The net surplus for the year amounted to €13.6 million, which was driven by the difference between the revenue of €32.9 million and expenses of €15.5 million, and, in addition, a foreign exchange loss of €3.8 million which was realized in 2020 as a result of the appreciation of the holdings in US dollars with respect to the euro.

167. The total balance for the NSF as presented in the Agency's financial statements relates to active contributions that are in various stages of implementation. Some of the contribution amounts are at late stages of procurement, while others are still in the programmatic planning stages. Where funds are not yet designated for projects in the system, it is generally because a contribution is recent, because negotiations are ongoing with a donor on how to use its contribution, or because the early planning stages of a longer-term project are under way.

168. Activities funded by Member States under the NSF often span multiple years of implementation, and, therefore, a positive fund balance is expected. Many of these contributions are also earmarked for specific activities, and, as a result, the use of these funds may take an extended period of time. Additional funds continue to be required to ensure the sustainable implementation of the Agency's activities in nuclear security.

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<sup>60</sup> The fund balance for the NSF presented in the Agency's financial statements is not a cash balance. Rather, it is the cash balance adjusted for the number of accounting entries.

<sup>61</sup> See document GC(65)/4.

## E. Goals and Priorities for 2021–2022

169. In the next reporting period, the Agency will continue to implement the actions called for in the *Nuclear Security Plan 2018–2021 and the Nuclear Security Plan 2022–2025* in a prioritized manner within available resources.<sup>62</sup>

170. In line with the ongoing priorities identified by Member States, the following are the main nuclear security programmatic goals and priorities for 2021–2022, subject to the *Nuclear Security Plan 2018–2021*, the *Nuclear Security Plan 2022–2025* and availability of resources:

- Promote further adherence to the Amendment to the CPPNM with the aim of its universalization and continue preparations for the Conference of the Parties to the Amendment to the CPPNM, planned for March 2022;
- Convene the International Conference on the Safe and Secure Transport of Nuclear and Radioactive Materials, to be held in December 2021;
- 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;
- Continue to expand and improve the Agency’s communications on nuclear security;
- Initiate construction of a training and demonstration facility for nuclear security at Seibersdorf;
- Further strengthen the existing programme of assisting Member States in preparing for and conducting major public events;
- Continue efforts to increase the representation of women and to ensure geographic distribution in the nuclear security field; and
- In close consultation with Member States, consider strengthening international norms and guidance supporting nuclear security.

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<sup>62</sup> See resolution GC(64)/RES/10, paragraph 54.



Annex 1

Nuclear Security Report 2021 at a Glance



## Annex 2

### Table of Concordance

**Table of Concordance between Resolution GC(64)/RES/10 Operative Paragraphs (OPs)  
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*Atoms for Peace and Development*

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