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Item 14 of the Conference's provisional agenda  
(GC(63)/1 and Add.1)

## Nuclear and Radiation Safety

*Report by the Director General*

### Summary

Pursuant to resolution GC(62)/RES/6, a report covering the following subjects is submitted to the Board of Governors and the General Conference for their consideration:

- General;
- The Agency's safety standards;
- Self-assessments and the Agency's peer review and advisory services;
- Nuclear installation safety;
- Radiation safety and environmental protection;
- Transport safety;
- The safety of spent fuel and radioactive waste management;
- Safety in decommissioning, uranium mining and processing, and environmental remediation;
- The safe management of radioactive sources;
- Capacity building;
- Nuclear and radiological incident and emergency preparedness and response; and
- Civil liability for nuclear damage.

### Recommended Action

- It is recommended that the Board of Governors and the General Conference consider and take note of this report.

# Nuclear and Radiation Safety

*Report by the Director General*

## **A. Introduction and General**

1. This report has been produced for the 63rd regular session (2019) of the General Conference in response to resolution GC(62)/RES/6, in which the General Conference requested the Director General to report in detail on implementation of the resolution and on other relevant developments in the intervening period. This report covers the period 1 July 2018 to 30 June 2019.

2. The Agency continued its efforts to maintain and strengthen nuclear, radiation, transport and waste safety, and emergency preparedness and response (EPR) capabilities, focusing, inter alia, on the technical areas and geographical regions where the need for such efforts is greatest. The Agency implemented numerous activities and services to assist Member States, considering or planning for the introduction of nuclear power or radiation technology, in establishing or strengthening their safety infrastructure and regulatory framework as well as building competency in several areas related to nuclear and radiation safety.<sup>1</sup>

3. The Agency continued to encourage Member States to become Contracting Parties to the Convention on Nuclear Safety (CNS), the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), the Convention on Early Notification of a Nuclear Accident (Early Notification Convention) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Assistance Convention). Activities related to the Conventions are reported in detail in subsequent sections of this report.<sup>2</sup>

4. In March 2019, a report by the Director General containing the draft *Nuclear Safety Review 2019* was submitted to the Board of Governors. The final version of the *Nuclear Safety Review 2019*, prepared in the light of discussions at the Board of Governors, is provided as an information document at the 63rd regular session of the Agency's General Conference. The *Nuclear Safety Review 2019* includes the global trends and the Agency's activities in 2018. It also presents priorities and related activities for 2019 and beyond, as identified by the Agency, for strengthening nuclear, radiation, transport and waste safety. These priorities are addressed in the Agency's Programme and Budget for 2020–2021, including outcomes, outputs, timelines and performance indicators.<sup>3</sup>

5. The Agency continued to provide legislative assistance to its Member States to support the development of adequate national legal frameworks and to promote adherence to the relevant

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<sup>1</sup> This relates to operative paragraphs 1 and 2 of resolution GC(62)/RES/6.

<sup>2</sup> This relates to operative paragraph 20 of resolution GC(62)/RES/6.

<sup>3</sup> This relates to operative paragraphs 3 and 127 of resolution GC(62)/RES/6.

international legal instruments. Specific bilateral legislative assistance was provided to 16 Member States through written comments and advice on drafting national nuclear legislation. Assistance in gaining more broadly a better understanding of the relevant international legal instruments was also provided to Member States through awareness missions and workshops conducted in Member States. The eighth session of the Nuclear Law Institute was held in Baden, Austria, in October 2018, and was attended by 61 participants from 52 Member States in Africa, Asia and the Pacific, Europe and Latin America and the Caribbean. The two-week course aimed to enhance knowledge of nuclear law, as well as to draft, amend or review national nuclear legislation.<sup>4</sup>

6. The eighth Treaty Event took place during the 62nd regular session of the Agency's General Conference. It provided Member States with a further opportunity to deposit their instruments of ratification, acceptance or approval of, or accession to, the treaties deposited with the Director General, including those related to nuclear safety, security and civil liability for nuclear damage.<sup>5</sup>

7. The Agency held a Technical Meeting on Safety Culture in Medical Uses of Radiation in Vienna in October 2018 to develop training material for strengthening radiation safety culture in medicine. Twenty-six participants from 12 Member States and 8 professional organizations provided information on current activities in radiation safety culture in their countries and helped to design a training curriculum and methodology for improving safety culture in medical applications.<sup>6</sup>

8. The Agency supported operating organizations of nuclear installations in enhancing their safety culture by organizing two national workshops on the Safety Culture Continuous Improvement Process (SCCIP) Implementation Support Programme for the Rosenergoatom Concern in Moscow in September 2018 and for Kalinin nuclear power plant (NPP) in Udomlya, Russian Federation, in February–March 2019. The Agency held a regional workshop on self-assessment of safety culture for nuclear regulatory bodies in Hanoi in October 2018, a national workshop on self-assessment of safety culture for the nuclear regulatory body in Minsk in January 2019 and a national workshop on regulatory oversight of safety culture in Islamabad in November 2018.<sup>7</sup>

9. The Agency held a Training Workshop on a Systemic Approach to Safety — Pragmatic Solutions in Vienna in October 2018 to assist in training managers of facilities, regulatory bodies and technical support organizations in assessing and identifying improvements to their systems and practices in support of leadership, management and culture for safety.<sup>8</sup>

10. During the 62nd regular session of the General Conference, the Agency held a side event entitled 'IAEA Assistance to Member States to Improve Safety by Improving the Subsystems of Industry, Regulators and Stakeholders in line with INSAG-27'. Speakers concluded that the Agency's safety standards address most of the elements of the institutional strength in depth concept as described in the International Nuclear Safety Group (INSAG) report *Ensuring Robust National Nuclear Safety Systems — Institutional Strength in Depth* (INSAG Series No. 27).<sup>9</sup>

11. The Agency held a Technical Meeting on the Safety and Security Interface — Approaches and National Experiences in Vienna in October–November 2018, at which 126 participants from 64 Member

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<sup>4</sup> This relates to operative paragraphs 20 and 99 of resolution GC(62)/RES/6.

<sup>5</sup> This relates to operative paragraphs 20 and 99 of resolution GC(62)/RES/6.

<sup>6</sup> This relates to operative paragraphs 4, 66 and 71 of resolution GC(62)/RES/6.

<sup>7</sup> This relates to operative paragraph 4 of resolution GC(62)/RES/6.

<sup>8</sup> This relates to operative paragraphs 4 and 99 of resolution GC(62)/RES/6.

<sup>9</sup> This relates to operative paragraph 5 of resolution GC(62)/RES/6.

States met to exchange information on approaches to addressing the interface in facilities and activities, to identify good practices in this area and to make recommendations to the Agency on further activities to assist Member States in managing safety and security interfaces effectively.<sup>10</sup>

12. The Agency held an International Workshop on Nuclear Security Measures and Emergency Response Arrangements for Ports in Las Vegas, United States of America, in November 2018 to address the interface between nuclear security measures and emergency response arrangements for Member States establishing appropriate arrangements at ports. The Agency also held an International Workshop on Nuclear Security Measures and Emergency Response Arrangements for Major Public Events in Washington DC in June 2019 to address the interface between nuclear security measures and emergency response arrangements for Member States hosting major public events.<sup>11</sup>

13. In the framework of the Asian Nuclear Safety Network (ANSN), the Agency held an Expert Meeting on the Coordination of Safety and Security Aspects for Establishing Synergy and Integration in Kuala Lumpur in October 2018. It also held an Expert Meeting on How to Develop Capacity Building for Safety Assessment and a Meeting of the Topical Group on Safety Assessment in Phuket, Thailand, in November 2018.<sup>12</sup>

14. Five Member States nominated a national Radiation Safety Information Management System (RASIMS) coordinator for the first time: Barbados, the Congo, Guyana, Marshall Islands, and Saint Vincent and the Grenadines. Twenty-two Member States nominated replacement RASIMS national coordinators: Argentina, Bulgaria, Brunei Darussalam, Costa Rica, Democratic Republic of the Congo, Dominican Republic, Ecuador, Egypt, Indonesia, Jamaica, Kazakhstan, Malaysia, Mongolia, Paraguay, Philippines, Serbia, Syrian Arab Republic, Trinidad and Tobago, United Arab Emirates, Uzbekistan, Venezuela and Zimbabwe. Eighty-one Member States updated their radiation safety infrastructure profiles. The Agency launched a new version of RASIMS — RASIMS 2.0 — in the second half of 2018 and held four interregional workshops in Vienna to assist RASIMS national coordinators in using RASIMS 2.0: 1 in October 2018, attended by 18 coordinators; 1 in March 2019, attended by 16 coordinators; and 2 in May 2019, attended by 11 and 9 coordinators, respectively.<sup>13</sup>

15. The Fifth Plenary Meeting of the Global Nuclear Safety and Security Network (GNSSN) took place during the 62nd regular session of the General Conference in September 2018. Member State representatives discussed the importance of the interface between safety and security and learned about the latest developments in the safety and security of small and medium sized or modular reactors (SMRs). The GNSSN Steering Committee met in Vienna in November 2018 and in May 2019 to advise the Agency, inter alia, on capacity building methodologies and nuclear safety knowledge management to sustain national programmes for safety.<sup>14</sup>

16. The Agency organized two Steering Committee meetings of the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO), one in Brasília in June–July 2018 and another in Bogotá in December 2018. At its annual meeting in Brasília in July 2018, the FORO's plenary approved three new projects: periodic verification and maintenance of reusable packaging for the transport of radioactive material not subject to design approval; licensing criteria and inspection requirements for centralized radiopharmacies; and regulatory practices in the licensing of nuclear reactor

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<sup>10</sup> This relates to operative paragraph 6 of resolution GC(62)/RES/6.

<sup>11</sup> This relates to operative paragraph 6 of resolution GC(62)/RES/6.

<sup>12</sup> This relates to operative paragraphs 6 and 9 of resolution GC(62)/RES/6.

<sup>13</sup> This relates to operative paragraph 8 of resolution GC(62)/RES/6.

<sup>14</sup> This relates to operative paragraphs 6 and 9 of resolution GC(62)/RES/6.

operators. The Agency participated in two meetings of the European Nuclear Safety Regulators Group (ENSREG) in Brussels in October 2018 and March 2019, to exchange information in areas of mutual interest, such as nuclear safety and radioactive waste management. The Agency provided comments on the ENSREG's topical peer review report, entitled 'Ageing Management of Nuclear Power Plants and Research Reactors'.<sup>15</sup>

17. The Agency held two programme committee meetings in Vienna, in November 2018 and in April 2019, to develop the announcement and the programme of the fifth International Conference on Effective Nuclear and Radiation Safety Regulatory Systems, which will be held in November 2019.<sup>16</sup>

18. The Agency held the International Conference on the Challenges Faced by Technical and Scientific Support Organizations in Enhancing Nuclear Safety and Security: Ensuring Effective and Sustainable Expertise in Brussels in October 2018, attended by more than 250 participants from 61 Member States and 5 international organizations. The Conference highlighted initiatives to develop and strengthen scientific and technical capabilities supporting regulatory decision-making for enhanced nuclear and radiation safety and security. In November 2018, the Agency published the proceedings of the International Conference on the Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security: Strengthening Cooperation and Improving Capabilities, held in Beijing in October 2014.<sup>17</sup>

19. The Agency held a Regional Workshop on Graded Approach Implementation, Technical Services and New Technologies Authorization, Inspection and Enforcement in Sarajevo in June 2019.<sup>18</sup>

## **B. The Agency's Safety Standards**

20. The Commission on Safety Standards (CSS) met in Vienna in November 2018 and in April 2019. The Emergency Preparedness and Response Standards Committee (EPreSC), the Nuclear Safety Standards Committee (NUSSC), the Radiation Safety Standards Committee (RASSC) and the Transport Safety Standards Committee (TRANSSC) met twice in Vienna in October–November 2018 and June 2019. The Waste Safety Standards Committee (WASSC) met three times in Vienna in July 2018, November 2018 and June 2019. The Agency used electronic means to facilitate the remote participation of Member States' representatives in the meetings of the CSS and Safety Standards Committees.<sup>19</sup>

21. The CSS endorsed for submission to the Board of Governors the draft Safety Requirements publication *Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSR-1). The CSS also endorsed the following draft Safety Guides for submission for publication: *Radiation Safety of X ray Generators and other Radiation Sources Used for Inspection Purposes and for Non-Medical Human Imaging* (DS471); *Decommissioning of Medical, Industrial and Research Facilities* (DS403); *Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants* (DS481); *Design of the Reactor Containment and Associated Systems for Nuclear Power Plants* (DS482); *Accident Management Programme for Nuclear Power Plants* (DS483); *Establishing the Safety Infrastructure for a Nuclear Power Programme* (DS486); *Design of the Reactor Core for Nuclear*

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<sup>15</sup> This relates to operative paragraph 10 of resolution GC(62)/RES/6.

<sup>16</sup> This relates to operative paragraph 25 of resolution GC(62)/RES/6.

<sup>17</sup> This relates to operative paragraph 27 of resolution GC(62)/RES/6.

<sup>18</sup> This relates to operative paragraph 27 of resolution GC(62)/RES/6.

<sup>19</sup> This relates to operative paragraphs 37 and 39 of resolution GC(62)/RES/6.

*Power Plants (DS488); Deterministic Safety Analysis for Nuclear Power Plants (DS491); Human Factors Engineering in the Design of Nuclear Power Plants (DS492); Radiation Safety in Well Logging (DS419); Radiation Safety in the Use of Nuclear Gauges (DS420); Radiation Safety of Accelerator Based Radioisotope Production Facilities (DS434); Design of Auxiliary Systems and Supporting Systems for Nuclear Power Plants (DS440); Format and Content of the Safety Analysis Report for Nuclear Power Plants (DS449); Management of Residues Containing Naturally Occurring Radioactive Material from Uranium Production and other Activities (DS459); Arrangements for Public Communications in Preparedness and Response for a Nuclear or Radiological Emergency (DS475); Design of Fuel Handling and Storage Systems for Nuclear Power Plants (DS487); and Storage of Spent Nuclear Fuel (DS489).*<sup>20</sup>

22. The Agency issued the Safety Requirements publication entitled *Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSR-1). The issuance of this publication completes the set of Safety Requirements. The Agency also issued 12 Safety Guides: *Occupational Radiation Protection* (IAEA Safety Standards Series No. GSG-7); *Regulatory Control of Radioactive Discharges to the Environment* (IAEA Safety Standards Series No. GSG-9); *Prospective Radiological Environmental Impact Assessment for Facilities and Activities* (IAEA Safety Standards Series No. GSG-10); *Organization, Management and Staffing of the Regulatory Body for Safety* (IAEA Safety Standards Series No. GSG-12); *Functions and Processes of the Regulatory Body for Safety* (IAEA Safety Standards Series No. GSG-13); *Predisposal Management of Radioactive Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education* (IAEA Safety Standards Series No. SSG-45); *Radiation Protection and Safety in Medical Uses of Ionizing Radiation* (IAEA Safety Standards Series No. SSG-46); *Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities* (IAEA Safety Standards Series No. SSG-47); *Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-48); *Decommissioning of Medical, Industrial and Research Facilities* (IAEA Safety Standards Series No. SSG-49); *Human Factors Engineering in the Design of Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-51); and *Accident Management Programmes for Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-54).<sup>21</sup>

23. The backlog of draft safety standards endorsed by the CSS between April 2015 and June 2018 was eliminated through improvements in the publication and approval process and all of these safety standards were published. In November 2018, the CSS established a new process for the final confirmation of its endorsement after a draft safety standard has been edited, which further reduced the time needed from consultation with Member States to final publication of a safety standard. The Secretariat established regular internal seminars to enhance the quality of the manuscripts from the beginning of their preparation, including issues related to translation.<sup>22</sup>

24. The Agency also issued the 2018 Edition of the IAEA Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection, which has been revised and updated to take into account new terminology and usage in safety standards issued between 2007 and 2018.<sup>23</sup>

25. The Interface Group, which gathers together chairs of the Safety Standards Committees and the Nuclear Security Guidance Committee, reviewed 12 publication proposals for possible safety–security

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<sup>20</sup> This relates to operative paragraphs 6, 37 and 73 of resolution GC(62)/RES/6.

<sup>21</sup> This relates to operative paragraphs 40 and 41 of resolution GC(62)/RES/6.

<sup>22</sup> This relates to operative paragraph 38 of resolution GC(62)/RES/6.

<sup>23</sup> This relates to operative paragraph 40 of resolution GC(62)/RES/6.

interfaces following a recommendation from the Secretariat's Coordination Committee on Safety Standards and Nuclear Security Series Publications.<sup>24</sup>

26. The Agency included all new safety standards and nuclear security guidance publications in the Nuclear Safety and Security Online User Interface (NSS-OUI) platform. The NSS-OUI platform was used to develop a strategic plan for the revision of Safety Guides on the safety of nuclear fuel cycle facilities. Members of the Committees and the CSS can access an interface that allows them to provide direct feedback on existing publications.<sup>25</sup>

27. The Agency continued to attend meetings of committees of the International Commission on Radiological Protection (ICRP) as an observer and participated in several ICRP task groups on specific topics. The Agency continued its cooperation with the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). The Agency held a consultancy meeting in Vienna in March 2019 to discuss the implications of the 2012 UNSCEAR report's Annex on *Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks*. The participants initiated the preparation of a Safety Report that will provide practical guidance on how to apply the concepts of retrospective attribution of radiation health effects and prospective inference of radiation health risks in the areas covered by the IAEA safety standards, making a clear distinction between situations for which health effects can be unequivocally attributed and those for which only notional health effects might be inferred. The Safety Report will also discuss how the concepts of attribution and inference can influence the communication of radiation risks and will encourage national authorities to consider how they can achieve more clarity with regard to communicating radiation risks in different situations.<sup>26</sup>

### **C. Self-Assessment and the Agency's Peer Review and Advisory Services**

28. The Agency conducted five Integrated Regulatory Review Service (IRRS) missions, to Australia in November 2018, Germany in March–April 2019, the Republic of Moldova in December 2018 and Norway in June 2019, as well as to Spain in October 2018, which was the first combined IRRS–Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) mission. Four IRRS follow-up missions were conducted, in Armenia in June 2019, Estonia in March 2019, Hungary in September 2018 and the Netherlands in November 2018. The Agency held a training course for future IRRS reviewers in the area of radiation and nuclear safety in Vienna in March 2019, attended by 39 participants. The Agency held a workshop in Luxembourg in November 2018 to exchange information, experience and lessons learned from the IRRS missions conducted since 2014, as well as to discuss recent developments and future expectations for the IRRS programme and to explore further improvements in the planning and implementation of IRRS missions in the longer term. The Agency held a regional workshop, also in Luxembourg in November 2018, to discuss specific aspects related to the IRRS missions that have been conducted so far in Member States of the European Union (EU) to assist these countries in fulfilling their obligations under the EU legislation for nuclear safety. The Agency published the new version of the IRRS guidelines in

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<sup>24</sup> This relates to operative paragraph 6 of resolution GC(62)/RES/6.

<sup>25</sup> This relates to operative paragraph 41 of resolution GC(62)/RES/6.

<sup>26</sup> This relates to operative paragraph 43 of resolution GC(62)/RES/6.

December 2018 and the corresponding revised Self-Assessment of Regulatory Infrastructure for Safety (SARIS) tool in January 2019.<sup>27</sup>

29. The Agency conducted three Operational Safety Review Team (OSART) missions, in China in January 2019, the Islamic Republic of Iran in September 2018 and the Russian Federation in November 2018, and one OSART mission at an NPP in the pre-operational phase prior to initial fuel load, in France in June 2019. Seven OSART follow-up missions were conducted, in Canada in September 2018, China in January 2019, France in May 2019, Romania in March 2019, the Russian Federation in May 2019, Slovenia in October 2018 and the United States of America in April 2019.<sup>28</sup>

30. The Agency conducted a follow-up Integrated Safety Assessment of Research Reactors (INSARR) mission in Petten, the Netherlands, in April 2019.<sup>29</sup>

31. The Agency conducted three Site and External Events Design (SEED) missions, in Egypt in January 2019, the Islamic Republic of Iran in November 2018 and Kenya in November 2018.<sup>30</sup>

32. The Agency conducted two Integrated Nuclear Infrastructure (INIR) Phase 1 missions, in the Philippines in December 2018 and Sudan in August 2018, and an INIR Phase 2 mission in Saudi Arabia in July 2018.<sup>31</sup>

33. The Agency conducted three Safety Aspects of Long Term Operation (SALTO) missions, in Armenia in November 2018, Mexico in March 2019 and Sweden in June 2019, and two pre-SALTO missions that reviewed existing plant programmes and long term operation plans at an early stage of their preparation, in Argentina in October 2018 and Spain in January 2019. Two SALTO follow-up missions were conducted, in Belgium in June 2019 and China in May 2019. Two expert missions covering selected areas of the SALTO mission scope were conducted, in Pakistan in October 2018 and South Africa in September 2018.<sup>32</sup>

34. The Agency conducted four ARTEMIS missions, in Brazil in October 2018, Estonia in March 2019, Luxembourg in September 2018 and Spain in October 2018 (the latter being, as indicated above, the first combined IRRS–ARTEMIS mission). The Agency held a Workshop on the Integrated Review Service for Radioactive Waste Management, Decommissioning and Remediation (ARTEMIS) in Vienna in March 2019, attended by more than 65 participants from 38 Member States and the European Commission. The participants discussed the need for planning and implementing long-term management programmes for all types of radioactive waste and spent fuel, and how the ARTEMIS service can assist Member States in the evaluation and implementation of such programmes.<sup>33</sup>

35. The Agency conducted ten Advisory Missions on Regulatory Infrastructure for Radiation Safety (AMRAS), to Bolivia in February 2019, Burkina Faso in October 2018, Chad in November 2018, Curaçao in June 2019, Dominican Republic in March 2019, The Gambia in July 2018, Liberia in July 2018, Mauritania in February 2019, Sierra Leone in February 2019 and Zambia in January 2019, and four follow-up missions, to Costa Rica in September 2018, Paraguay in August 2018, Sri Lanka in

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<sup>27</sup> This relates to operative paragraphs 45, 46 and 47 of resolution GC(62)/RES/6.

<sup>28</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>29</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>30</sup> This relates to operative paragraphs 13, 45 and 46 of resolution GC(62)/RES/6.

<sup>31</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>32</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>33</sup> This relates to operative paragraphs 45, 46, 47 and 48 of resolution GC(62)/RES/6.



April 2019 and Uruguay in August 2018. The Agency continues to address radiation safety infrastructure in Member States that have expressed an interest in establishing or enhancing their cancer control capacity through impACT ('integrated missions of the Programme of Action for Cancer Therapy') review missions. Five such missions were conducted, in Armenia in April 2019, Ecuador in March 2019, Guyana in December 2018, Mauritius in December 2018 and North Macedonia in September 2018.<sup>34</sup>

36. The Agency conducted three Occupational Radiation Protection Appraisals (ORPAS) missions, in Bosnia and Herzegovina in October 2018, Dominican Republic in August 2018 and Indonesia in November 2018, and one follow-up mission in the United Republic of Tanzania in November 2018.<sup>35</sup>

37. The Agency conducted two Education and Training Appraisal (EduTA) missions to assess education and training in radiation safety, in Zambia in May 2019 and Kenya in June 2019.<sup>36</sup>

38. The Agency conducted three Emergency Preparedness Review (EPREV) missions, in Belarus in October 2018, Canada in June 2019 and Cuba in November 2018.<sup>37</sup>

39. The Agency finalized the Technical Safety Review (TSR) of Safety Requirements for Saudi Arabia in January 2019. The Agency finalized the guidelines for TSR peer review services for publication in the IAEA Services Series.<sup>38</sup>

40. The Agency conducted two Independent Safety Culture Assessment (ISCA) missions, in South Africa in August 2018 and in Thailand in March 2019. One follow-up mission was conducted in the Netherlands in April 2019, in parallel with the INSARR mission.<sup>39</sup>

41. The Agency conducted a Safety Culture Continuous Improvement Process (SCCIP) follow-up support mission in Veracruz, Mexico, in August 2018.<sup>40</sup>

42. The Agency is discussing with the World Health Organization (WHO) the coordination of the Agency's EPREV service and the WHO's Joint External Evaluations for the International Health Regulations in the area of radiation emergencies, to minimize overlap and avoid placing an unnecessary burden on Member States requesting these missions.<sup>41</sup>

## **D. Nuclear Installation Safety**

43. The Agency continued to encourage its Member States, especially those planning, constructing, commissioning or operating NPPs, or considering a nuclear power programme, to become Contracting Parties to the Convention on Nuclear Safety (CNS). This was done through discussions with Member States' representatives during Agency conferences, meetings, peer review missions and visits of the

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<sup>34</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>35</sup> This relates to operative paragraphs 45, 46 and 69 of resolution GC(62)/RES/6.

<sup>36</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>37</sup> This relates to operative paragraphs 45, 46 and 49 of resolution GC(62)/RES/6.

<sup>38</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>39</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>40</sup> This relates to operative paragraphs 45 and 46 of resolution GC(62)/RES/6.

<sup>41</sup> This relates to operative paragraph 50 of resolution GC(62)/RES/6.

Director General to Member States, as well as through technical cooperation projects. The Agency also held a Workshop to Promote the CNS and the Joint Convention in Vienna in December 2018, to give Member States a broader understanding of the CNS and the Joint Convention, and to further encourage adherence to the two Conventions and active participation in the peer review processes. The workshop was attended by 12 Member States that are not Contracting Parties to the CNS and/or the Joint Convention. In the reporting period, two Member States, Morocco and Thailand, became new Contracting Parties to the CNS, bringing the total number of Contracting Parties to 86. The Agency held the Organizational Meeting for the Eighth Review Meeting in Vienna in October 2018, during which a number of preparatory decisions related to the conduct of the upcoming Review Meeting were taken and agreed by consensus. Contracting Parties, in particular, decided on the establishment and composition of altogether seven Country Groups and elected the President, Vice-Presidents well as Country Group Officers for the Eighth Review Meeting. The Meeting, following up on the decision of the Seventh Review Meeting to continue to hold topical sessions during future Review Meetings, decided to recommend 'Ageing Management' and 'Safety Culture' for consideration as topics for these sessions. The Agency also facilitated the Officers' Turnover Meeting in Vienna in March 2019 where the officers of the CNS Seventh Review Meeting shared with the officers elected for the CNS Eighth Review Meeting their experience and feedback on the preparation and conduct of the previous review meetings. At the Meeting, incoming and outgoing officers also discussed the Review Meeting process in detail, including key documents, in order to ensure the transfer of knowledge on the CNS, its processes and the role of the officers.<sup>42</sup>

44. The Agency held a Workshop on the Application of the New Safety Requirements for NPP Design in Vienna in October 2018, attended by 24 participants from 14 Member States. Participants exchanged experience on the interpretation and practical application of the Safety Requirements publication *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1 (Rev. 1)) and discussed new and complex topics, such as design extension conditions and the concept of practical elimination.<sup>43</sup>

45. The Agency held a consultancy meeting in Vienna in December 2018 to finalize an IAEA Technical Document (TECDOC) on experiences related to implementing safety improvements at existing NPPs and approaches and strategies for minimizing radioactive releases in the event of a nuclear accident. The draft TECDOC is based on Member States' approaches and practices in identifying and performing safety improvements.<sup>44</sup>

46. The Agency held Regional Meetings on the Application of the Code of Conduct on the Safety of Research Reactors, for the Africa region in Rabat in July 2018, attended by 15 participants from 10 Member States, and for the Europe region in Brussels in March 2019, attended by 25 participants from 14 Member States. The participants exchanged information on the safety status of their research reactors and on their experience in applying the provisions of the Code.<sup>45</sup>

47. The Agency organized three meetings of the Regional Advisory Safety Committee for Research Reactors for the Africa region in Cairo in July 2018; for the Europe region in Istanbul, Turkey, in September 2018; and for the Asia and the Pacific region in Argonne, United States of America, in October 2018. The meetings focused on periodic safety reviews, the safety of utilization and modifications of research reactors, and safety reassessment, including design extension conditions and emergency planning. The meetings provided a forum for safety committees of research reactor operating

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<sup>42</sup> This relates to operative paragraph 20 of resolution GC(62)/RES/6.

<sup>43</sup> This relates to operative paragraph 52 of resolution GC(62)/RES/6.

<sup>44</sup> This relates to operative paragraph 52 of resolution GC(62)/RES/6.

<sup>45</sup> This relates to operative paragraph 22 of resolution GC(62)/RES/6.

organizations to exchange information and share knowledge and experiences on the safety issues of common interest.<sup>46</sup>

48. The Agency conducted the Annual Meeting on the Safety and Licensing of Research Reactors for the Arab Atomic Energy Agency (AAEA), Arab Network of Nuclear Regulators (ANNuR) and Forum of Nuclear Regulatory Bodies in Africa (FNRBA) in Accra in October 2018, attended by 22 participants from 13 Member States. The Agency also conducted an expert mission on establishing a regulatory inspection programme for research reactors in Amman in October 2018. The Agency held a Workshop on Regulatory Inspection Programmes for Research Reactors for the AAEA, ANNuR and FNRBA in Rabat in November 2018. Twenty-six participants from 14 Member States identified good practices and areas that need improvement with regard to regulatory inspection and enforcement programmes. The Agency conducted safety missions on site evaluation and regulatory supervision to new research reactor projects in La Paz in August 2018 and Bangkok in November 2018. The Agency also conducted a safety mission on the construction programme of the low power research reactor in Riyadh in December 2018.<sup>47</sup>

49. The Agency held the second Technical Programme Committee Meeting on the International Conference on Research Reactors: Addressing Challenges and Opportunities to Ensure Effectiveness and Sustainability in Vienna in May 2019 to finalize the evaluation process of extended synopses, develop the preliminary Conference programme, advise on the review process of full papers, and define any follow-up actions required during the period prior to the Conference.<sup>48</sup>

50. The Agency held a Workshop on Safety Aspects of Ageing Management, in Tashkent in August 2018, as part of the preparation for an ageing management peer review mission to the WWR-SM research reactor. The Agency also conducted a safety mission on implementation of periodic safety reviews for the ETRR-2 research reactor in Cairo in February 2019.<sup>49</sup>

51. The Agency continued to support Member States planning to establish the first or a new research reactor. A workshop on the IAEA's Milestones approach for research reactor projects was held in Vienna in November 2018. The Agency conducted a national workshop and mission to prepare for an Integrated Nuclear Infrastructure Review for Research Reactors (INIR-RR) in Zambia in September 2018, and an INIR-RR mission in Viet Nam in December 2018.<sup>50</sup>

52. The Agency held a Technical Meeting on Safety and Utilization of Sub-Critical Assemblies, in Vienna in October 2018, attended by 17 participants from 14 Member States. The meeting provided a forum to discuss issues related to the safe management and effective utilization of sub-critical assemblies, including associated challenges, experiences and good practices.<sup>51</sup>

53. The Agency held a Technical Meeting on the Use of a Graded Approach in the Application of the Safety Requirements for Nuclear Fuel Cycle Facilities, in Vienna in July 2018, attended by 35 participants from 25 Member States. The meeting provided a forum for sharing information and exchanging knowledge and experiences among the participating Member States in relation to the use of

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<sup>46</sup> This relates to operative paragraphs 9 and 53 of resolution GC(62)/RES/6.

<sup>47</sup> This relates to operative paragraphs 2, 13, 53 and 101 of resolution GC(62)/RES/6.

<sup>48</sup> This relates to operative paragraph 53 of resolution GC(62)/RES/6.

<sup>49</sup> This relates to operative paragraphs 53 and 55 of resolution GC(62)/RES/6.

<sup>50</sup> This relates to operative paragraphs 2, 13 and 53 of resolution GC(62)/RES/6.

<sup>51</sup> This relates to operative paragraph 53 of resolution GC(62)/RES/6.

a graded approach in the application of the safety requirements for nuclear fuel cycle facilities, in particular in the areas of regulatory inspection, safety analysis and operational safety.<sup>52</sup>

54. Thirty-four representatives from 25 Member States and 2 international organizations attended the First Meeting of the Steering Committee for Phase 4 of the International Generic Ageing Lessons Learned (IGALL) Programme held in Vienna in December 2018. The purpose of the meeting was to review the work carried out under Phase 4 of the IGALL Programme, in particular the results achieved by the Working Groups. The Agency also held a National Workshop on Establishment of On-Going Equipment Qualification Programme, in the framework of the IGALL Programme, in Buenos Aires in September 2018.<sup>53</sup>

55. Six SALTO workshops combined with SALTO preparatory meetings were held, in Yerevan in July 2018; Buenos Aires in July 2018; Bucharest in August 2018; Tarragona, Spain, in September 2018; Veracruz, Mexico, in October 2018; and Kyiv in May 2019. A SALTO preparatory meeting was also held in Forsmark, Sweden, in December 2018. Two additional SALTO workshops were held in Ipswich, United Kingdom, in September 2018 and Mochovce, Slovakia, in March 2019.<sup>54</sup>

56. The Agency held a Workshop on Long term Operation and Ageing Management at the corporate level for Rosenergoatom, as part of the preparation for the Corporate OSART mission in Moscow in July 2018.<sup>55</sup>

57. In November 2018, the Agency published a Safety Report entitled *Consideration of External Hazards in Probabilistic Safety Assessment for Single Unit and Multi-unit Nuclear Power Plants* (IAEA Safety Reports Series No. 92). This publication outlines the generic methodology for probabilistic safety assessment of NPPs against external hazards. It integrates design, procedural, operational and human factors, as well as protection and mitigation aspects that are essential for modelling an NPP's response to an external hazard and assessing the associated risk. It specifically addresses the identification and screening of external hazards considering the impact on multi-unit plants.<sup>56</sup>

58. The Agency held two consultancy meetings in Vienna in August and November 2018 to complete the case study on multi-unit probabilistic safety assessment (MUPSA), with the aim of providing feedback to improve the MUPSA methodology previously developed. The Agency has initiated the development of a Safety Report on Level 1 MUPSA to summarize insights gained in this case study. In addition, the Agency finalized a project report on the aggregation of risk contributors for nuclear facilities, which covers the aggregation of risks associated with various sources of radioactivity and operational states, multi-unit sites and a full spectrum of hazards.<sup>57</sup>

59. The Agency held a Consultancy Meeting on Safety Aspects of Using Smart Digital Devices in Nuclear Safety Systems, in Vienna in March 2019, to develop the first draft of a Safety Report. The Agency held a preparatory meeting in Vienna in June 2019 for the Technical Meeting on the Management of Direct Current Power Systems and Application of New Digital Devices in Safety Electrical Power Systems, to be organized in collaboration with the Nuclear Energy Agency of the

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<sup>52</sup> This relates to operative paragraph 40 of resolution GC(62)/RES/6.

<sup>53</sup> This relates to operative paragraph 55 of resolution GC(62)/RES/6.

<sup>54</sup> This relates to operative paragraph 55 of resolution GC(62)/RES/6.

<sup>55</sup> This relates to operative paragraph 55 of resolution GC(62)/RES/6.

<sup>56</sup> This relates to operative paragraph 59 of resolution GC(62)/RES/6.

<sup>57</sup> This relates to operative paragraph 59 of resolution GC(62)/RES/6.

Organisation for Economic Co-operation and Development (OECD/NEA) in December 2019 in Vienna.<sup>58</sup>

60. The Agency held a Technical Meeting on Hydrogen Management in Severe Accidents in Vienna in September 2018, attended by 28 participants from 21 Member States and the OECD/NEA. The participants exchanged information on state-of-the-art methods and the use of numerical tools, and identified and consolidated knowledge about the currently known gaps in understanding of hydrogen behaviour during severe accidents in water cooled reactors.<sup>59</sup>

61. The Agency held a Regional Workshop on Severe Accident Analysis in Tokyo in November 2018, attended by 18 participants from 9 Member States. The participants exchanged information on severe accident analysis in order to contribute to the development and improvement of severe accident management guidelines at NPPs.<sup>60</sup>

62. The Agency held, in cooperation with the International Centre for Theoretical Physics (ICTP), the Second Joint ICTP–IAEA Course on Scientific Novelties in the Phenomenology of Severe Accidents in Water Cooled Reactors, in Trieste, Italy, in June 2019, attended by 22 participants from 14 Member States. The participants gained understanding of the physical, chemical and radiological phenomena specific to severe accidents in water cooled reactors.<sup>61</sup>

63. The Agency held the fourth Training Workshop on the Development of Severe Accident Management Guidelines Using the IAEA’s SAMG-D Toolkit in Vienna in October. The workshop was attended by 27 participants from 20 Member States.<sup>62</sup>

64. The Incident Reporting System for Research Reactors (IRSRR) and the Fuel Incident Notification and Analysis System (FINAS) continue to facilitate the exchange of information on nuclear incidents and accidents in Member States. The Agency held the biannual Technical Meeting for the National Coordinators of the Incident Reporting System for Research Reactors in Vienna in June 2019, attended by 38 participants from 35 Member States. The meeting facilitated the exchange of information on safety significant events in research reactors and identified generic lessons and the associated corrective actions, including those involving human factors and ageing management. The Agency held the biannual Technical Meeting for the National Coordinators of the Joint IAEA–OECD/NEA Fuel Incident Notification and Analysis System in Vienna in September 2018, attended by 27 Coordinators from 18 Member States. The meeting facilitated the exchange of operating experience and recognized the increased use of FINAS by Member States as indicated by the significant increase in event reporting.<sup>63</sup>

65. Participating Member States submitted 77 reports to the International Reporting System for Operating Experience (IRS), which is jointly operated by the IAEA and the OECD/NEA and facilitates the exchange of information on nuclear incidents and accidents in Member States. The Agency, in cooperation with the OECD/NEA, initiated the extension of the IRS database to incorporate the construction experience database (ConEX). The Agency held a consultancy meeting in Vienna in October 2018 to review the current IRS and identify further opportunities for its improvement. New functionalities were included into the system, enabling the easy export, trending and charting of incident data. The Agency held two workshops, in Minsk in July 2018 and Vienna in May 2019, and five national

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<sup>58</sup> This relates to operative paragraph 61 of resolution GC(62)/RES/6.

<sup>59</sup> This relates to operative paragraph 62 of resolution GC(62)/RES/6.

<sup>60</sup> This relates to operative paragraph 63 of resolution GC(62)/RES/6.

<sup>61</sup> This relates to operative paragraph 63 of resolution GC(62)/RES/6.

<sup>62</sup> This relates to operative paragraph 63 of resolution GC(62)/RES/6.

<sup>63</sup> This relates to operative paragraph 64 of resolution GC(62)/RES/6.

training courses, in Temelin, Czech Republic, in September 2018, Buenos Aires in December 2018, Angra dos Reis, Brazil, in February 2019, Bratislava in April 2019 and Helsinki in May 2019, to support the establishment of effective operational experience feedback programmes and to promote incident reporting to the IRS. The Agency, in cooperation with the World Association of Nuclear Operators, held a Technical Meeting to discuss lessons learned from recent incidents at NPPs and methods to improve operating experience feedback programme effectiveness in Vienna in September 2018. The Agency, in cooperation with the OECD/NEA, held a Technical Meeting of IRS national coordinators to share recent operating experience from events at NPPs and to discuss the use of the IRS in Vienna in October 2018. Information on the IRS and the results of the meeting were used to develop summary operating experience reports, such as the IAEA–OECD/NEA publication *Nuclear Power Plant Operating Experience*, issued by the Agency and the OECD/NEA in 2018. The report provides Member States with an overview of incidents with important lessons learned and overall trends of incidents reported to the IRS in the period 2012–2014.<sup>64</sup>

66. The Agency held two consultancy meetings in Vienna in October 2018 and May 2019 to review and finalize the report of a study on how the Safety Requirements publication *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1 (Rev. 1)) is applicable to SMRs intended for near term deployment.<sup>65</sup>

67. In August 2018, the Agency published the proceedings of an International Conference on Topical Issues in Nuclear Installation Safety: Safety Demonstration of Advanced Water Cooled Nuclear Power Plants, held in Vienna in June 2017. This conference included SMRs as a key topic and provided a forum to present and discuss the latest approaches, advances and challenges in the demonstration of the safety of NPPs that are planned to be licensed and constructed in the near future.<sup>66</sup>

68. The Agency facilitated the organization of two meetings of the Small Modular Reactor Regulators' Forum in Vienna in October 2018 and March 2019. The Forum is preparing an interim document describing Member State experience and challenges related to licensing, design and safety analysis, as well as to manufacturing, supply chain, commissioning and operations.<sup>67</sup>

69. The Agency established a Coordination Group on SMRs to coordinate the activities on SMRs carried out by the relevant Agency Departments. The Agency initiated preparations for an informal technical briefing on transportable nuclear power plants (TNPPs). The Agency will hold this briefing on its work on TNPPs in August 2019.<sup>68</sup>

## **E. Radiation Safety and Environmental Protection**

70. The Agency held two Regional Workshops on Lessons Learned in Applying the IAEA General Safety Requirements Part 3, for the Europe region in Nicosia in March 2019 and for the Asia and the

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<sup>64</sup> This relates to operative paragraph 64 of resolution GC(62)/RES/6.

<sup>65</sup> This relates to operative paragraph 65 of resolution GC(62)/RES/6.

<sup>66</sup> This relates to operative paragraph 65 of resolution GC(62)/RES/6.

<sup>67</sup> This relates to operative paragraph 65 of resolution GC(62)/RES/6.

<sup>68</sup> This relates to operative paragraphs 7 and 65 of resolution GC(62)/RES/6.

Pacific region in Singapore in April 2019. In December 2018, the Agency held two National Workshops on the Implementation of the International Basic Safety Standards, in Manama and Rabat.<sup>69</sup>

71. The Agency held a Technical Meeting in Vienna in July 2018 to obtain input on the draft revision of the Safety Guide *Remediation Process for Areas Affected by Past Activities and Accidents* (IAEA Safety Standards Series No. WS-G-3.1). The meeting was attended by five international organizations. The Agency also held a consultancy meeting in Vienna in November 2018 to review the changes suggested during the Technical Meeting and revise the draft Safety Guide.<sup>70</sup>

72. The Agency held a Technical Meeting to discuss the development of the draft Safety Guide on *Source Monitoring, Environmental Monitoring and Individual Monitoring for Protection of the Public and the Environment* (DS505) in Vienna in December 2018, attended by 51 participants from 31 Member States and 3 international organizations. The participants discussed, inter alia, the design and establishment of robust, fit-for-purpose monitoring programmes to ensure and demonstrate protection of the public and the environment for planned, emergency and existing exposure situations over the entire lifetime of facilities and activities.<sup>71</sup>

73. The Agency continued to support the Information System on Occupational Exposure (ISOE), jointly operated by the IAEA and the OECD/NEA. One new utility member from China joined the ISOE.<sup>72</sup>

74. The Agency promoted the Information System on Occupational Exposure in Medicine, Industry and Research module on industrial radiography (ISEMIR-IR) through regional workshops in Gaborone in August 2018 and Tunis in November 2018. It was also promoted at national workshops on industrial radiography in Nottingham, United Kingdom, and Koszalin, Poland, in October 2018. The Agency conducted related promotional activities in China and the Republic of Korea in October 2018. The Agency held a consultancy meeting in Vienna in February 2019 to discuss the mechanism for operation and the approach for promotion of ISEMIR-IR.<sup>73</sup>

75. The Agency co-organized the third International Conference on Dosimetry and its Applications in Lisbon in May 2019, attended by 350 participants from 40 Member States and 4 international organizations. The conference brought together scientists and engineers interested in a broad range of dosimetry topics involving the measurement and application of ionizing radiation, such as radiation protection and dosimetry in medicine and industry, including naturally occurring radioactive material (NORM) industries.<sup>74</sup>

76. The Agency held a Technical Meeting on Safety Assessment for Long Term Management of Radioactive Residues from Uranium Production in Vienna in November 2018, attended by 20 participants from 17 Member States. The participants recommended that a document be developed on safety assessment of uranium production activities and of the remediation of uranium legacy sites.<sup>75</sup>

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<sup>69</sup> This relates to operative paragraphs 13 and 66 of resolution GC(62)/RES/6.

<sup>70</sup> This relates to operative paragraphs 66 and 95 of resolution GC(62)/RES/6.

<sup>71</sup> This relates to operative paragraph 66 of resolution GC(62)/RES/6.

<sup>72</sup> This relates to operative paragraph 67 of resolution GC(62)/RES/6.

<sup>73</sup> This relates to operative paragraph 68 of resolution GC(62)/RES/6.

<sup>74</sup> This relates to operative paragraph 69 of resolution GC(62)/RES/6.

<sup>75</sup> This relates to operative paragraph 70 of resolution GC(62)/RES/6.

77. The Agency held a meeting in Dakar in November 2018 to develop training material for Member States with mining industries that transport NORM, including uranium ore, and to make changes to existing training material. In addition, the Agency developed a training package on occupational radiation protection in NORM industries, and the corresponding e-learning material is under development. The Agency held 3 webinars on radiation protection in NORM industries, attended by 509 participants.<sup>76</sup>

78. The Agency held a Technical Meeting on Radiation Exposure of Patients from Recurrent Radiological Imaging Procedures in Vienna in March 2019, attended by 53 participants from 26 Member States and 9 international organizations. The participants reviewed evidence on the increased cumulative radiation exposure of patients undergoing recurrent medical imaging procedures, focusing on groups of patients with chronic diseases, and provided advice on the necessary follow-up actions.<sup>77</sup>

79. The Agency held a side event during the 62nd regular session of the General Conference, entitled Strengthening Safety in Nuclear Medicine — Accident Prevention. The event focused on the increased benefits and reduced risks associated with integrating radiation protection into the quality management systems of nuclear medicine departments at hospitals.<sup>78</sup>

80. Together with WHO, the Agency co-sponsored the Second Workshop on Optimization and Justification of Radiological Practices for Portuguese Speaking Countries, held during the 47th Brazilian Congress of Radiology in Rio de Janeiro, Brazil, in October 2018. The Agency held regional training courses on justification of medical radiation exposure and use of the Agency's referral guidelines in Warsaw in September 2018.<sup>79</sup>

81. The Agency held a joint course with the ICTP on quality assurance and dose management in hybrid imaging in Trieste, Italy, in September 2018. The Agency also held a regional training course for the Latin America and the Caribbean region on justification in radiodiagnosis, in San Salvador in July 2018, for healthcare authorities in order to create awareness of how to use the Agency's referral guidelines to avoid unnecessary patient exposure.<sup>80</sup>

82. The Agency held a National Workshop on Radiation Safety in Non-Medical Human Imaging and Consumer Products in Abu Dhabi in October 2018. The purpose of the workshop was to review the national programmes on radiation exposure of the public in the areas of non-medical human imaging and consumer products and commodities; to promote the application of the requirements established in the International Basic Safety Standards and provide Agency guidance on radiation safety in non-medical imaging and consumer products; and to share experience and review the practical challenges in the application of the requirements.<sup>81</sup>

83. The Agency released six online modules of radon-related training material for self-study by Member States, co-sponsored by WHO. In cooperation with WHO, the Conference of Radiation Control

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<sup>76</sup> This relates to operative paragraphs 70 and 99 of resolution GC(62)/RES/6.

<sup>77</sup> This relates to operative paragraph 71 of resolution GC(62)/RES/6.

<sup>78</sup> This relates to operative paragraph 71 of resolution GC(62)/RES/6.

<sup>79</sup> This relates to operative paragraph 71 of resolution GC(62)/RES/6.

<sup>80</sup> This relates to operative paragraphs 13 and 72 of resolution GC(62)/RES/6.

<sup>81</sup> This relates to operative paragraphs 13 and 73 of resolution GC(62)/RES/6.



Program Directors and the European Radon Association, the Agency organized 7 webinars, attended by 962 participants, to assist Member States in reducing exposure to radon.<sup>82</sup>

84. The Agency held a Steering Group meeting of a project on developing guidance on radioactivity in food and drinking water in non-emergency situations in Vienna in December 2018. The group reviewed the work carried out since its previous meeting in November 2017 and prioritized the future activities. The Agency, in cooperation with the Food and Agriculture Organization of the United Nations (FAO), UNSCEAR and WHO, completed a review of measurements of natural radionuclides in food published in the literature during the period 1998–2017. Twenty-four Member States provided measurement data from ongoing environmental monitoring programmes and research projects over the same period. These data will be used to assess the range of radiation doses associated with different ‘cluster diets’ defined by WHO in its Global Environmental Monitoring System Food Programme (GEMS/Food) database.<sup>83</sup>

85. The Agency held two consultancy meetings in Vienna in July 2018 and January 2019 to further develop the draft Safety Guide *Application of the Concept of Exemption* (DS499) and discuss the content of a Safety Report on contaminated non-food commodities.<sup>84</sup>

86. The Agency held a Technical Meeting in Vienna in March 2019 to discuss progress in the development of Safety Guides *Application of the Concept of Exemption* (DS499) and *Application of the Concept of Clearance* (DS500). Forty participants from 28 Member States and 2 representatives of the World Nuclear Association attended the meeting.<sup>85</sup>

87. The Agency held the third Technical Meeting of the second phase of the Modelling and Data for Radiological Impact Assessments (MODARIA II) programme in Vienna in October 2018, attended by approximately 150 participants from 47 Member States. The programme builds experience and transfers knowledge in the assessment of radiation doses from radionuclides that are being released to or are already present in the environment.<sup>86</sup>

88. The most recent update of *Inventory of Radioactive Materials Resulting from Historical Dumping, Accidents and Losses at Sea — For the Purposes of the London Convention 1972 and Protocol 1996* (IAEA-TECDOC-1776) was made in 2015. The Agency communicates with the Secretariat of the Convention at the International Maritime Organization and updates the inventory when requested to do so.<sup>87</sup>

89. The Agency held a Technical Meeting on the Implementation of the IAEA Safety Guides for the Protection of the Public and the Environment in Vienna in April 2019, attended by 43 participants from 26 Member States and 1 international organization. The participants discussed the implementation of the recently published General Safety Guides *Radiation Protection of the Public and the Environment* (IAEA Safety Standards Series No. GSG-8), *Regulatory Control of Discharges to the Environment* (IAEA Safety Standards Series No. GSG-9) and *Prospective Radiological Environmental Impact Assessment for Facilities and Activities* (IAEA Safety Standards Series No. GSG-10). The meeting provided an opportunity to disseminate information to participants from countries with different levels

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<sup>82</sup> This relates to operative paragraph 74 of resolution GC(62)/RES/6.

<sup>83</sup> This relates to operative paragraph 75 of resolution GC(62)/RES/6.

<sup>84</sup> This relates to operative paragraph 76 of resolution GC(62)/RES/6.

<sup>85</sup> This relates to operative paragraph 76 of resolution GC(62)/RES/6.

<sup>86</sup> This relates to operative paragraph 41 and 77 of resolution GC(62)/RES/6.

<sup>87</sup> This relates to operative paragraph 78 of resolution GC(62)/RES/6.

of nuclear development on recent approaches to regulating and controlling radiological impacts on the public and the environment.<sup>88</sup>

## F. Transport Safety

90. A side event entitled ‘Denials and Delays of Shipments of Nuclear and Other Radioactive Materials’ was hosted by the Government of Brazil in Vienna, Austria, in September 2018 during the 62nd regular session of the General Conference. The event was attended by 50 delegates, including representatives of 20 Member States, and raised awareness of issues that can occur during transport that may result in shipments being delayed or sent by suboptimal routes, including material with medical applications.<sup>89</sup>

91. In February 2019, the Agency launched phase 1 of the e-learning platform on *Regulations for the Safe Transport of Radioactive Material: 2012 Edition* (IAEA Safety Standards Series No. SSR-6). Phase 2, which was developed for regulatory bodies, was launched in May 2019 and includes guidance on implementing the General Safety Requirements contained in *Governmental, Legal and Regulatory Framework for Safety* (IAEA Safety Standards Series No. GSR Part 1 (Rev. 1)) and the SSR-6 requirements.<sup>90</sup>

92. The Dialogue between Coastal and Shipping States continued to discuss the maritime transport of radioactive material. The Agency participated in a workshop, held in Dublin in May 2019, to analyse lessons learned from a tabletop exercise conducted in June 2017, which involved the simultaneous participation of national authorities from Austria, Portugal and Spain. The Agency provided an overview of the tabletop exercises facilitated by the Agency in 2015 and 2017, at the request of the Dialogue between Coastal and Shipping States.<sup>91</sup>

## G. The Safety of Spent Fuel and Radioactive Waste Management

93. The Agency continued to encourage its Member States to become Contracting Parties to the Joint Convention and to participate actively in the peer review process and contribute to the effectiveness of that process. In the reporting period, Paraguay and Thailand became new Contracting Parties to the Joint Convention, bringing the total number of Contracting Parties to 80. The Agency held a Regional Workshop to Promote the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management for the Asia and the Pacific region in Jakarta in October 2018, attended by eight Member States that are not Contracting Parties.<sup>92</sup>

94. Following the request from the Sixth Review Meeting of the Contracting Parties to the Joint Convention, the Secretariat has initiated preparation of the agenda for the Fourth Extraordinary Meeting

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<sup>88</sup> This relates to operative paragraph 40 of resolution GC(62)/RES/6.

<sup>89</sup> This relates to operative paragraph 81 of resolution GC(62)/RES/6.

<sup>90</sup> This relates to operative paragraph 82 of resolution GC(62)/RES/6.

<sup>91</sup> This relates to operative paragraphs 84 and 85 of resolution GC(62)/RES/6.

<sup>92</sup> This relates to operative paragraph 20 of resolution GC(62)/RES/6.

that will take place in 2020 to discuss possible ways to improve procedural mechanisms of the Joint Convention.<sup>93</sup>

95. The Agency held the Second Technical Meeting of the Working Group on the Use of Monitoring Programmes in the Safe Development of Geological Disposal Facilities in Vienna in December 2018, attended by 28 participants from 17 Member States. The participants discussed and further developed guidance on how to select safety measures based on the results of monitoring of geological disposal facilities.<sup>94</sup>

96. The Agency held a Workshop on Responsible and Safe Management of Radioactive Waste and Spent Fuel in Tbilisi in December 2018 to support Member States in the development and implementation of safe management solutions, including geological disposal, for all types of radioactive waste and spent nuclear fuel, in line with the provisions of the EU's Instrument for Nuclear Safety Cooperation.<sup>95</sup>

97. The Agency held an International Conference on the Management of Spent Fuel from Nuclear Power Reactors: Learning from the Past, Enabling the Future in Vienna in June 2019, attended by 315 participants from 50 Member States and 8 international organizations. The participants discussed advances in the management of spent fuel from power reactors to identify strategies for the future considering technological developments, regulatory requirements and safety.<sup>96</sup>

98. The Agency held two Technical Meetings in Vienna in July 2018: a Technical Meeting on the Current Status of the Predisposal Management of Institutional Radioactive Waste, attended by more than 30 participants from 25 Member States, and a Technical Meeting on Methodologies and Approaches to Address Challenges in Managing Radioactive Waste from Past Activities, attended by 26 participants from 14 Member States. The Agency, in cooperation with the European Commission and the OECD/NEA, held a joint meeting on the status and trends in spent fuel and radioactive waste management in Luxembourg in July 2018.<sup>97</sup>

99. The Agency held the Second Technical Meeting on Development of an Approach to Define Generic Test Conditions for Dual Purpose Casks in Vienna in October 2018, attended by 30 participants from 15 Member States. The participating experts further developed an approach for defining generic test conditions for dry storage of spent nuclear fuel in dual purpose casks (DPCs) and on-site transport of DPCs, and agreed on the work plan for finalizing the project report.<sup>98</sup>

## **H. Safety in Decommissioning, Uranium Mining and Processing, and Environmental Remediation**

100. The Agency held a Technical Meeting to launch the International Project on Completion of Decommissioning (COMDEC) in Vienna in September 2018, attended by 40 participants from

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<sup>93</sup> This relates to operative paragraph 18 of resolution GC(62)/RES/6.

<sup>94</sup> This relates to operative paragraph 88 of resolution GC(62)/RES/6.

<sup>95</sup> This relates to operative paragraph 88 of resolution GC(62)/RES/6.

<sup>96</sup> This relates to operative paragraph 89 of resolution GC(62)/RES/6.

<sup>97</sup> This relates to operative paragraph 89 of resolution GC(62)/RES/6.

<sup>98</sup> This relates to operative paragraph 89 of resolution GC(62)/RES/6.

29 Member States. The COMDEC project provides a systematic overview of practical experience worldwide in defining decommissioning end states, in demonstrating compliance with end state criteria and in defining and implementing any needed measures and controls after the end of decommissioning. The Agency also held a meeting of the three Working Groups of the COMDEC project in Vienna in June 2019, attended by 17 participants from 10 Member States. The participants provided input for the revision of the Safety Guide *Release of Sites from Regulatory Control on Termination of Practices* (IAEA Safety Standards Series No. WS-G-5.1).<sup>99</sup>

101. The Agency held the Third Annual Technical Meeting of the project on Data Analysis and Collection for Costing of Research Reactor Decommissioning — Phase II (DACCORD) in Vienna in October 2018, attended by 29 participants from 26 Member States. The project aims to enhance collaboration on the costing of research reactor decommissioning projects.<sup>100</sup>

102. The Agency held a Steering Group meeting of the International Project on Decommissioning of Small Facilities in Vienna in April 2019. The Steering Group developed the terms of reference for this project and prepared a plan for the Second Technical Meeting.<sup>101</sup>

103. In January 2019, the Agency published a Safety Report entitled *Methodologies for Assessing the Induced Activation Source Term for Use in Decommissioning Applications* (IAEA Safety Reports Series No. 95). This publication provides information on the selection and application of methodologies for the assessment of the induced activation source term for decommissioning purposes.<sup>102</sup>

104. In May 2019, the Agency published the Safety Report *Management of Project Risks in Decommissioning* (IAEA Safety Reports Series No. 97). This publication provides practical guidance on managing project risks in decommissioning; proposes a systematic and proactive approach to identifying, analysing, evaluating and treating relevant project risks at strategic and operational levels; and provides examples for the application of the proposed approach.<sup>103</sup>

105. The Agency held the second Annual Meeting of the Regulatory Forum for Safety of Uranium Production and Naturally Occurring Radioactive Materials (REGSUN) in Vienna in June 2019, attended by 32 participants from 22 Member States. The participants discussed the application of the draft Safety Guide *Management of Residues Containing Naturally Occurring Radioactive Material from Uranium Production and Other Activities* (DS459), graded approaches for regulating and managing NORM residues, and enhancement of communication and training for safety and regulatory aspects of uranium production and NORM activities.<sup>104</sup>

106. The Agency organized the Technical Meeting of the Coordination Group for Uranium Legacy Sites in Cholpon Ata, Kyrgyzstan, in June 2019. The meeting was attended by an African Member State for the first time. The Agency also held a meeting to revise the strategic plan and terms of reference for the Coordination Group for Uranium Legacy Sites (CGULS) in Vienna in January 2019.<sup>105</sup>

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<sup>99</sup> This relates to operative paragraph 94 of resolution GC(62)/RES/6.

<sup>100</sup> This relates to operative paragraph 94 of resolution GC(62)/RES/6.

<sup>101</sup> This relates to operative paragraph 94 of resolution GC(62)/RES/6.

<sup>102</sup> This relates to operative paragraph 94 of resolution GC(62)/RES/6.

<sup>103</sup> This relates to operative paragraph 94 of resolution GC(62)/RES/6.

<sup>104</sup> This relates to operative paragraph 95 of resolution GC(62)/RES/6.

<sup>105</sup> This relates to operative paragraph 96 of resolution GC(62)/RES/6.

107. In the framework of the CGULS, the Agency held the first Regional Workshop on Public Awareness for Remediation in Central Asia in Dushanbe in November 2018, attended by 29 participants from 5 Member States and 3 international organizations. The workshop served as a platform for Central Asian participants to share their experience and lessons learned in developing local public awareness programmes.<sup>106</sup>

108. The *Strategic Master Plan for Environmental Remediation of Uranium Legacy Sites in Central Asia* was presented at a side event during the 62nd regular session of the General Conference. The Agency participated in a side event to the United Nations General Assembly in September 2018, entitled *People and Planet: Central Asia calls for International Solidarity*, to raise awareness of the Strategic Master Plan among a broader audience.<sup>107</sup>

109. The Agency continued supporting the International Working Forum on Regulatory Supervision of Legacy Sites (RSLs), assisting Member States and fostering exchange of information on effective and efficient regulatory supervision for the management of legacy sites. The Agency held a Technical Meeting of the RSLs in Vienna in November 2018, attended by more than 30 participants from 19 Member States. The participants shared experiences and lessons learned related to the role of regulators in the overall remediation process and discussed the draft revision of the Safety Guide *Remediation Process for Areas Affected by Past Activities and Accidents* (IAEA Safety Standards Series No. WS-G-3.1).<sup>108</sup>

## I. Safe Management of Radioactive Sources

110. The Agency conducted three missions to provide assistance in the management and recovery of disused sources, to Iceland, Malta and Viet Nam. A number of operations were conducted to remove disused sealed radioactive sources (DSRSs) from user premises and to place them in safe and secure storage conditions. One Category 1 and 2 DSRS was removed from North Macedonia. Two Category 1 and 2 DSRSs are scheduled for removal from Albania. The Agency initiated further projects for the removal of Category 1 and 2 DSRSs from Bahrain, Cambodia, the Congo, Cyprus, Peru and Tunisia, and the consolidation of nine Category 1 and 2 DSRSs to a centralized storage facility in Bogotá.<sup>109</sup>

111. A side event was held during the 62nd regular session of the General Conference on Innovative Solutions for the Effective Management of Disused Sealed Radioactive Sources. The Agency held a consultancy meeting on the application of the graded approach to post-closure safety assessment for the disposal of disused sealed radioactive sources in boreholes in Vienna in December 2018.<sup>110</sup>

112. The Agency held a Regional Training Course on Conducting Orphan Source Searches in Nairobi in January–February 2019. Eighteen participants from eight Member States from the Africa region

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<sup>106</sup> This relates to operative paragraph 96 of resolution GC(62)/RES/6.

<sup>107</sup> This relates to operative paragraph 96 of resolution GC(62)/RES/6.

<sup>108</sup> This relates to operative paragraph 97 of resolution GC(62)/RES/6.

<sup>109</sup> This relates to operative paragraph 107 of resolution GC(62)/RES/6.

<sup>110</sup> This relates to operative paragraph 107 of resolution GC(62)/RES/6.

received training on methodologies for conducting orphan source searches, including the use of radiation detection equipment, for the safe and secure recovery of orphan sources.<sup>111</sup>

113. As of 30 June 2019, 137 States had made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 118, including 4 States in the reporting period, have also notified the Director General of their intention to act in a harmonized manner in accordance with the Code's supplementary Guidance on the Import and Export of Radioactive Sources. A total of 143 States have nominated points of contact to facilitate the export and import of radioactive sources. Nineteen States have notified the Director General of their intention to act in a harmonized manner and in accordance with the Code's supplementary Guidance on the Management of Disused Radioactive Sources, including 16 States in the reporting period.<sup>112</sup>

114. The Agency held an Open-ended Meeting of Technical and Legal Experts to Share Information on States' Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance in Vienna, in May 2019, attended by more than 150 participants from 100 Member States; and a similar meeting aimed specifically at small island developing States from the Caribbean and the Pacific areas, in Vienna, in August 2018, at which 34 experts from 17 Member States shared experiences on the application of the Code of Conduct. The Agency held three regional meetings on this topic for the Africa region in Kampala, in September 2018, attended by 32 participants from 28 Member States, and in Lusaka, in March 2019, attended by 32 participants from 28 Member States; and for the Latin America and the Caribbean region in Montevideo, in October 2018, attended by 19 participants from 12 Member States.<sup>113</sup>

115. The Agency held a consultancy meeting in Vienna in August 2018 to identify mechanisms to facilitate information exchange between interested Member States on radiation safety aspects of the management of movement of scrap metal or materials produced from scrap metal that may inadvertently contain radioactive material.<sup>114</sup>

## **J. Capacity Building**

116. In July 2018, the Agency published a Safety Report entitled *A Methodology for Establishing a National Strategy for Education and Training in Radiation, Transport and Waste Safety* (IAEA Safety Reports Series No. 93). This publication provides guidance on how to assess education and training needs in order to design the national education and training programme in these areas of safety, and how to optimize the use of national resources to complement external assistance.<sup>115</sup>

117. Five Postgraduate Educational Courses in Radiation Protection and the Safety of Radiation Sources were conducted in English, French and Spanish at the Agency-affiliated regional training centres in Africa, Asia, Europe, and Latin America and the Caribbean. In response to increasing demand for guidance on strengthening regulatory requirements for education, training, qualification and competence of radiation protection officers and qualified experts, the Agency held three regional

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<sup>111</sup> This relates to operative paragraph 107 of resolution GC(62)/RES/6.

<sup>112</sup> This relates to operative paragraphs 21 and 109 of resolution GC(62)/RES/6.

<sup>113</sup> This relates to operative paragraph 109 of resolution GC(62)/RES/6.

<sup>114</sup> This relates to operative paragraph 110 of resolution GC(62)/RES/6.

<sup>115</sup> This relates to operative paragraph 98 of resolution GC(62)/RES/6.

workshops: for the Europe region in Sliema, Malta, in October 2018; for the Asia and the Pacific region in Amman, in November 2018; and for Latin America and the Caribbean in Panama City, in December 2018. The Agency held two train-the-trainers workshops for radiation protection officers, in Rabat, in November 2018 (in French and English), and Beirut, in March 2019 (in English and Arabic).<sup>116</sup>

118. The Agency conducted four interregional training courses for countries embarking on nuclear power: one on the licensing process for NPPs, with an emphasis on siting and site evaluation, in Moscow in July 2018, attended by 23 participants from 17 Member States; one on safety review and assessment by the regulatory body, also in Moscow, in August 2018, attended by 17 participants from 8 Member States; one on the implementation of national requirements in Helsinki in August 2018, attended by 15 participants from 9 Member States; and one on national responsibilities and infrastructure for new nuclear power programmes in San José in May 2019, attended by 25 participants from 18 Member States. The Agency conducted a hands-on regulatory inspector training workshop for Member States embarking on a nuclear power programme at the Zwentendorf NPP in Austria in October 2018, attended by 17 participants from 15 Member States. The Agency conducted two expert missions to support operators and regulators in developing their management systems: for human factors, leadership for safety and safety culture in Ghana in October 2018; and for process and documentation structure in Poland in November 2018. The Agency also conducted five capacity building workshops on site evaluation for nuclear installations, in Egypt in September 2018, in Tunisia in October 2018, in Thailand in January 2019, and in Tunisia and Uzbekistan, both in February 2019, as well as a regional workshop for Asia and the Pacific on site evaluation for nuclear installations, in Bangkok in September 2018.<sup>117</sup>

119. The Agency held a Regional Workshop on National Policy and Strategy for Safety, Including Knowledge Transfer for Safety in Bangkok in November 2018 for ANSN Member States, and a Regional Workshop on Regulatory Infrastructure for Nuclear Safety in Daejeon, Republic of Korea, in December 2018 for ANNuR, ANSN and FNRBA member countries. The Agency held a National Training Course on Licensing Processes for NPPs, in Accra in August 2018, and a Regional Workshop on Safety Review and Assessment by the Regulatory Body, in Bangkok in July 2018. The Agency held a regional school on basic regulatory inspection for NPPs for the Europe region in Warsaw in September 2018. The Agency provided guidance to the Malaysian Atomic Energy Licensing Board on organizational structure and staffing during an expert mission in Dengkil, Malaysia, in September 2018. The Basic Professional Training Course on Nuclear Safety was delivered in May and June 2018 for staff at Ghana's Nuclear Regulatory Authority.<sup>118</sup>

120. The Agency evaluated the Pilot International School of Nuclear and Radiological Leadership for Safety and, as a result, enhanced role-playing exercises and expanded the training materials to support extending the programme for the School from one week to two. The Agency held a one-week regional School for the Asia and the Pacific region in New Delhi in November 2018 and a one-week national School in Rio de Janeiro, Brazil, in June 2019. The Agency also held two two-week Schools: one for the Latin America and the Caribbean region in Mexico City in November 2018; and another for the Europe region in Ankara in April–May 2019. The Agency held a consultancy meeting in Vienna in April 2019 to develop a train-the-trainers package for the School.<sup>119</sup>

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<sup>116</sup> This relates to operative paragraphs 13 and 99 of resolution GC(62)/RES/6.

<sup>117</sup> This relates to operative paragraphs 2 and 99 of resolution GC(62)/RES/6.

<sup>118</sup> This relates to operative paragraphs 2, 99 and 103 of resolution GC(62)/RES/6.

<sup>119</sup> This relates to operative paragraph 99 of resolution GC(62)/RES/6.

121. The Agency conducted three Schools of Radiation Emergency Management, in Tulln, Austria, in October 2018, and in College Station, Texas, United States of America and Rabat in November 2018, with a total of 82 attendees from 46 Member States.<sup>120</sup>

122. The Agency conducted six advisory missions on education and training in radiation, transport and waste safety: to Mexico in September 2018; to Chile and to Kyrgyzstan in October 2018; to Brazil in November 2018; to Morocco in April 2019; and to Myanmar in June 2019.<sup>121</sup>

123. The Agency held a Workshop of the Capacity Building Centres for Emergency Preparedness and Response: Exchanging Experience and Looking for Synergies in Vienna in July 2018. The Workshop was attended by 33 participants from 19 Member States and was the first step towards developing a network of such Centres.<sup>122</sup>

124. The Agency developed a draft Safety Report entitled *Managing Nuclear Safety Knowledge: National Approaches and Experience* to assist Member States in developing a national level strategy or a coordination mechanism for nuclear safety knowledge management, in line with the Agency's safety standards and good practices. The Agency held a workshop in Berlin in December 2018, based on the draft Safety Report.<sup>123</sup>

125. The Agency hosted the FNRBA Plenary Meeting in Vienna in September 2018. The meeting approved a roadmap of project priorities with the support of FNRBA partners, based on an online survey developed by the Agency.<sup>124</sup>

126. The Agency supported the third and fourth meetings of the Steering Committee for the European and Central Asian Safety Network (EuCAS) in Prague in August 2018 and in Vienna in May 2019. The Steering Committee established a new Working Group on Education and Training and developed a work plan for 2020.<sup>125</sup>

127. The Agency held two Steering Committee meetings of the ANSN in Vienna in November 2018 and June 2019. The Steering Committee approved the revised terms of reference of ANSN organizations and established a work plan for 2020. The third ANSN plenary, held during the 62nd regular session of the General Conference, endorsed the new ANSN vision, terms of reference of ANSN organizations and the establishment of new Topical Groups of the ANSN.<sup>126</sup>

128. The Agency hosted the ANNuR Plenary Meeting during the 62nd regular session of the General Conference. The participants stated that many of their States consider nuclear energy a solution for climate change. The participants discussed the publication of a training programme for the regulatory supervision of research reactors and the development of a sample manual for the planning, management and conduct of regulatory review and assessment of safety for NPPs.<sup>127</sup>

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<sup>120</sup> This relates to operative paragraphs 2, 13 and 99 of resolution GC(62)/RES/6.

<sup>121</sup> This relates to operative paragraph 99 of resolution GC(62)/RES/6.

<sup>122</sup> This relates to operative paragraphs 99 and 100 of resolution GC(62)/RES/6.

<sup>123</sup> This relates to operative paragraph 100 of resolution GC(62)/RES/6.

<sup>124</sup> This relates to operative paragraph 101 of resolution GC(62)/RES/6.

<sup>125</sup> This relates to operative paragraph 101 of resolution GC(62)/RES/6.

<sup>126</sup> This relates to operative paragraph 101 of resolution GC(62)/RES/6.

<sup>127</sup> This relates to operative paragraph 101 of resolution GC(62)/RES/6.



129. The Agency held a Regional Workshop on Establishing a Management System in the Regulatory Body, for ANNuR and FNRBA members, in Hurgada, Egypt, in September 2018. The Agency conducted two expert missions to support operators and regulators in developing their management systems, to Ghana in October 2018 and to Poland in November 2018.<sup>128</sup>

130. The Agency organized the annual plenary meeting of the Regulatory Cooperation Forum (RCF) in Vienna in September 2018, attended by 70 participants from 27 RCF countries, the European Commission and other Member States. The Agency conducted two missions, to Bangladesh in April 2019 and to the Sudan in June 2019, to review the current status of regulatory infrastructure development and to identify RCF support plans.<sup>129</sup>

131. The Agency updated and launched a revised version of the Control of Sources Network (CSN) portal. New features include a platform for Member States to discuss and share regulatory information and documentation for strengthening their radiation safety infrastructure.<sup>130</sup>

132. The Agency's Steering Committee on Education and Training in Radiation, Transport and Waste Safety met in Vienna in December 2018 to advise the Secretariat on the implementation of the Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020. The Steering Committee issued recommendations to revise and update the Strategic Approach 2011–2020, and to develop guidance on the role and duties of radiation protection officers and qualified experts. The Steering Committee on Regulatory Capacity Building and Knowledge Management held its ninth annual meeting in Vienna in December 2018. The Committee discussed the implementation of the Strategic Approach to Education and Training in Nuclear Safety 2013–2020. It also addressed other matters relevant to education and training, such as knowledge management, the methodology for Systematic Assessment of Regulatory Competence Needs, and the possible set of indicators for the implementation of the Strategic Approach 2013–2020.<sup>131</sup>

133. In January 2019, the Agency published a TECDOC entitled *Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Radiation Facilities and Activities* (IAEA-TECDOC-1860). The Agency held three national workshops based on *Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Nuclear Installations* (IAEA-TECDOC-1757), in Jakarta and Rabat in November 2018 and Bangkok in July 2018, to analyse the training and development needs of a regulatory body, identify gaps in competence for NPP safety and establish a training programme to bridge these gaps.<sup>132</sup>

## **K. Nuclear and Radiological Incident and Emergency Preparedness and Response**

134. The Agency continued to encourage Member States' adherence to the Early Notification Convention and the Assistance Convention. In the reporting period, one Member State adhered to the

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<sup>128</sup> This relates to operative paragraphs 2 and 101 of resolution GC(62)/RES/6.

<sup>129</sup> This relates to operative paragraph 101 of resolution GC(62)/RES/6.

<sup>130</sup> This relates to operative paragraphs 9 and 101 of resolution GC(62)/RES/6.

<sup>131</sup> This relates to operative paragraph 103 of resolution GC(62)/RES/6.

<sup>132</sup> This relates to operative paragraph 103 of resolution GC(62)/RES/6.

Early Notification Convention and one Member State to the Assistance Convention, bringing the total number of Parties to 122 and 117, respectively.<sup>133</sup>

135. The Agency conducted a ConvEx-1a exercise in January 2019. The exercise tested the continuous availability of Member States' National Warning Points. The Agency conducted a ConvEx-1b exercise in October 2018, which tested the extent to which National Warning Points are continuously available and competent authorities can respond promptly to notifications received. The Agency held a ConvEx-2a exercise in June 2019. For this exercise, there was an increase in participation, from 56 Member States in 2018 to 60 in 2019. The participation of 71% of Member States with operating NPPs indicates the importance of this exercise for Member States. All participating Member States used the correct communication channels. The Agency conducted two ConvEx-2b exercises in the reporting period. The first, held in October 2018, attracted the participation of 45 Member States and 1 international organization. Seventeen Member States tested their capabilities for requesting assistance and preparing to receive it, while 28 Member States and 1 international organization participated as providers of assistance. The second ConvEx-2b exercise was held in March 2019 with the participation of 39 Member States and 3 international organizations. Seventeen Member States tested their capabilities for requesting assistance and preparing to receive it, while 22 Member States and 3 international organizations participated as providers of assistance. The Agency conducted a ConvEx-2c exercise in November 2018 with the participation of 58 Member States and 5 international organizations. This exercise, which was hosted by Ireland, tested the arrangements for response to a transnational radiological emergency triggered by a nuclear security event. The Agency continued the series of ConvEx-2e exercises to test the assessment and prognosis process, based on national exercises in Member States with operating NPPs. Eight ConvEx-2e exercises were conducted, and the assessment and prognosis process was also tested and evaluated in internal full response exercises and drills. In November 2018, the Agency conducted the first ConvEx-2f exercise to test the coordination of public information between the relevant international organizations, with representatives from six international organizations. In March 2019, the Agency invited all Member States to consider hosting the ConvEx-3 exercise in 2021.<sup>134</sup>

136. The Agency conducted a total of 27 regional and 17 national training events on various topics related to strengthening national EPR arrangements based on Agency guidance.<sup>135</sup>

137. The Agency held three Workshops on Arrangements for Notification, Reporting and Assistance in Nuclear or Radiological Incidents and Emergencies in Vienna in July 2018, March 2019 and May 2019. The workshops aimed to assist Member States in developing national operational arrangements that are consistent with the *Operations Manual for Incident and Emergency Communication* (EPR-IEComm 2012) and to consult with Member States on facilitating information exchange between interested Member States and competent authorities and on the revision of the manual.<sup>136</sup>

138. The Agency held a Technical Meeting on Advances in Emergency Preparedness and Response Technology and Arrangements in Vienna in April 2019, attended by 178 participants from 85 Member States and 3 international organizations. This meeting provided an opportunity to share advances in operational arrangements, developments of technology, and advances in accident simulations,

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<sup>133</sup> This relates to operative paragraph 20 of resolution GC(62)/RES/6.

<sup>134</sup> This relates to operative paragraph 112 of resolution GC(62)/RES/6.

<sup>135</sup> This relates to operative paragraphs 13, 113 and 115 of resolution GC(62)/RES/6.

<sup>136</sup> This relates to operative paragraphs 114, 115, 120 and 124 of resolution GC(62)/RES/6.

atmospheric dispersion modelling and techniques for handling data for nuclear and/or radiological emergency response.<sup>137</sup>

139. The Agency participated in 25 national emergency exercises and supported Member States in conducting and evaluating these exercises.<sup>138</sup>

140. The Agency further enhanced the security arrangements for the Unified System for Information Exchange (USIE) website by incorporating a two-factor authentication of user accounts and improving features for information management and the provision of assistance, and held five webinars to support Member States in using USIE, in November–December 2018. USIE was used by the contact points of States Parties to the Early Notification Convention and the Assistance Convention and by Member States in all workshops on arrangements for notification, reporting and assistance, as well as in all ConvEx exercises, including the ConvEx-2a exercises, where International Nuclear and Radiological Event Scale (INES) national officers were offered the possibility to use the INES Event Rating Form in order to post information on USIE.<sup>139</sup>

141. The Agency published an updated *IAEA Response and Assistance Network* manual (EPR-RANET (2018)) that guides actions to be performed by States providing and requesting international assistance. The Agency held a Response and Assistance Network (RANET) workshop at the RANET Capacity Building Centre in Fukushima Prefecture, Japan, in August 2018. The 33 participants from 11 Member States registered in RANET enhanced their capacity to respond to nuclear or radiological emergencies. The Agency held a Regional Workshop to Review the Template of the Mediterranean Regional EPR Plan, in Vienna in December 2018. The participants discussed ways to assist countries in the Mediterranean region to identify national assistance capabilities for possible registration in RANET.<sup>140</sup>

142. In response to a request from the Government of South Africa, in December 2018 an Agency Assistance Mission involving RANET capabilities provided medical advice in response to the overexposure of a patient. In response to a request from the Government of Georgia, in March 2019 the Agency provided assistance in relation to medical treatment for a patient affected by the radiological accident that occurred in Lilo, Georgia, in 1997. The patient's medical treatment was provided in France utilizing national assistance capabilities registered in RANET.<sup>141</sup>

143. The Agency held an International Symposium on Communicating Nuclear and Radiological Emergencies to the Public, in Vienna in October 2018. The symposium brought together almost 400 participants from 74 countries and 13 international organizations. It covered topics in EPR, stakeholder engagement, public communication channels and tools in emergencies, social media, effective communication, psychology of communication, coordination of information, communicating in different types of emergencies, responses to the question “Am I safe?” and ways to address public concerns in an emergency, lessons learned, innovative technologies and the future of communication. The participants emphasized the importance of implementing Agency safety standards, training materials and tools.<sup>142</sup>

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<sup>137</sup> This relates to operative paragraphs 114, 120 and 124 of resolution GC(62)/RES/6.

<sup>138</sup> This relates to operative paragraphs 84 and 115 of resolution GC(62)/RES/6.

<sup>139</sup> This relates to operative paragraph 117 of resolution GC(62)/RES/6.

<sup>140</sup> This relates to operative paragraph 119 of resolution GC(62)/RES/6.

<sup>141</sup> This relates to operative paragraph 119 of resolution GC(62)/RES/6.

<sup>142</sup> This relates to operative paragraphs 114 and 121 of resolution GC(62)/RES/6.

144. The Agency launched a coordinated research project (CRP) in January 2019 to study how to mitigate the harm resulting from online misinformation in nuclear emergencies. The CRP will assess methods and tools to identify online misinformation that misrepresents or contradicts authoritative safety recommendations. It will also review how effectively existing methods can prevent or mitigate the adverse effects of the detected misinformation. The results of the CRP will inform practical guidance for decision makers on correcting potential viral falsifications about authoritative protective measures.<sup>143</sup>

145. The Agency held an International Radiation Monitoring Information System (IRMIS) implementation workshop in Vienna in July 2018, attended by 21 participants from 19 Member States. The Agency held a Regional Workshop on Sharing Information on Early Warning Systems and Implementation of IRMIS for Communication of Monitoring Results for countries in the Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology, in Vienna in August 2018, attended by 19 participants from 8 Member States. In addition, the Agency held a Regional Workshop on Emergency Monitoring and International Data Sharing supporting regional nuclear EPR for member countries of the Association of Southeast Asian Nations in Jakarta in July 2018. This workshop was attended by 21 participants from 10 Member States.<sup>144</sup>

146. In July 2018, the Agency launched a new version of the Emergency Preparedness and Response Information Management System (EPRIMS), which provided improved usability and information sharing features. Four webinars were organized to support Member States in the use of the updated EPRIMS. By 30 June 2019, the number of modules of self-assessment uploaded to EPRIMS had increased to 939, enabling trends to be derived to better identify Member State needs. The Agency held a workshop at regional level in Vienna in June 2019 to support Member States in developing their self-assessment against the safety standard *Preparedness and Response for a Nuclear or Radiological Emergency* (IAEA Safety Standards Series No. GSR Part 7) for upload to EPRIMS.<sup>145</sup>

147. The Agency convened the 27th regular meeting of the Inter-Agency Committee on Radiation and Nuclear Emergencies (IACRNE) in Geneva, Switzerland, in June 2019, hosted by WHO and attended by more than 20 participants from 13 of the IACRNE organizations. The meeting reviewed IACRNE activities since the previous regular meeting and discussed, inter alia, preparedness and response activities in all participating and corresponding organizations; lessons identified in the ConvEx-2f exercise; the status of the Practical Arrangements with IACRNE participating organizations; other international exercises conducted since November 2017; and the IACRNE work programme for the next two-year period.<sup>146</sup>

148. The Agency, in cooperation with the European Commission, held a workshop in Luxembourg in December 2018 to discuss EPR requirements in GSR Part 7 and in relevant EU legislation, along with national experiences of their implementation.<sup>147</sup>

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<sup>143</sup> This relates to operative paragraph 121 of resolution GC(62)/RES/6.

<sup>144</sup> This relates to operative paragraph 122 of resolution GC(62)/RES/6.

<sup>145</sup> This relates to operative paragraph 123 of resolution GC(62)/RES/6.

<sup>146</sup> This relates to operative paragraph 125 of resolution GC(62)/RES/6.

<sup>147</sup> This relates to operative paragraph 125 of resolution GC(62)/RES/6.

149. The Agency, in cooperation with FAO, conducted a webinar in October 2018 to raise awareness of the requirements in GSR Part 7, specifically those in relation to food safety in a nuclear or radiological emergency. The webinar was attended by about 200 experts worldwide.<sup>148</sup>

## L. Civil Liability for Nuclear Damage

150. The Secretariat continued to assist Member States, upon request, in their efforts to adhere to the relevant nuclear liability instruments.<sup>149</sup>

151. A Regional Workshop on Civil Liability for Nuclear Damage for European States, hosted by the Government of Romania in Bucharest in April 2019, was attended by 74 participants from 25 Member States. The Secretariat also conducted an IAEA/International Expert Group on Nuclear Liability (INLEX) mission to the Sudan in November 2018.<sup>150</sup>

152. INLEX held its 19th regular meeting in Vienna in May 2019, during which conclusions were reached on several issues.<sup>151</sup>

153. INLEX reiterated its conclusions from previous meetings that a TNPP in a fixed position (that is, in the case of a floating reactor, anchored to the seabed or the shore, and attached to the shore by power lines) would fall under the definition of ‘nuclear installation’ and therefore be covered by the nuclear liability regime, and that, in the case of transport of a factory-fuelled reactor, the TNPP would also be covered by the nuclear liability conventions in the same way as any other transport of nuclear material. INLEX, however, noted that these conclusions could not apply in circumstances where the reactor was used for the propulsion of the vessel.<sup>152</sup>

154. INLEX discussed the issue of factory-fuelled reactors transported and deployed in a host State either not party to a nuclear liability convention or not party to the same convention as the sending State and where no unloading of fuel from the vessel occurs before the operation of the TNPP in the State of destination. It was noted in this respect that the language used in the nuclear liability conventions does not adequately cover this situation, as, under the nuclear liability conventions, the sending operator is liable until the nuclear material has been unloaded from the means of transport by which it has arrived in the territory of a non-Contracting State: if interpreted literally, this would entail that the sending operator would remain liable indefinitely, irrespective of whether the TNPP would thereafter be operated by another operator in the State of destination. INLEX therefore recommended that the Vienna Convention on Civil Liability for Nuclear Damage (Vienna Convention) and the Convention on Supplementary Compensation for Nuclear Damage (CSC) be interpreted to mean that, in such a case, the sending operator would cease to be liable when the TNPP is taken charge of by the authorized person in the State of destination. In this respect, INLEX added that, at some future point of time when the original sending operator took responsibility for the TNPP in order to return it to the sending State, that operator would again assume liability and decided that the potential further complications that may arise if the TNPP were to be deployed in a third State prior to its return to the State of origin need not be

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<sup>148</sup> This relates to operative paragraph 125 of resolution GC(62)/RES/6.

<sup>149</sup> This relates to operative paragraph 31 of resolution GC(62)/RES/6.

<sup>150</sup> This relates to operative paragraph 31 of resolution GC(62)/RES/6.

<sup>151</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.

<sup>152</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.

discussed at this stage. With these additional conclusions, INLEX considered the issues concerning TNPPs to be closed.<sup>153</sup>

155. With respect to liability issues concerning cyberattacks, INLEX concluded that, assuming the attack triggered a nuclear incident, there was no basis for treating a cyberattack differently from other acts of terrorism. On this basis, INLEX reaffirmed that, like other acts of terrorism, a cyberattack would not exonerate the operator from nuclear liability, unless that cyberattack amounted to “an act of armed conflict, hostilities, civil war or insurrection” and only if the nuclear incident were “directly due” to such an act. In this context, it was noted that the burden of proof would lie with the operator claiming such an exoneration before the competent court and that third-party liability insurance contracts generally do not contain an exoneration for cyberattacks.<sup>154</sup>

156. With respect to the issue of jurisdiction under the Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention (Joint Protocol), INLEX reaffirmed that, in the case of a nuclear incident involving the transport of nuclear material between operators whose installations are situated in States party to different nuclear liability conventions but both party to the Joint Protocol, jurisdiction lies with the courts of the incident State (including, in the case of a Party to the 1997 Vienna Convention or, in the future, to the Paris Convention on Third Party Liability in the Field of Nuclear Energy as amended by the 2004 Protocol, where the incident occurs within the area of its exclusive economic zone).<sup>155</sup>

157. INLEX discussed the differing amounts of compensation available under the various nuclear liability conventions and concluded that the higher liability amounts established by a State party to the 1997 Protocol to Amend the Vienna Convention are to be distributed without discrimination to victims in States party to the original 1963 Vienna Convention. INLEX also discussed issues that may arise if one or more States party to the Paris Convention and to the Brussels Convention Supplementary to the Paris Convention, as they will be revised by the Protocols adopted in 2004, decided to join the CSC, in particular as regards the definition of damage and the interaction between different supplementary compensation funds.<sup>156</sup>

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<sup>153</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.

<sup>154</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.

<sup>155</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.

<sup>156</sup> This relates to operative paragraph 32 of resolution GC(62)/RES/6.