IAEA 60 Years
Atoms for Peace and Development

Board of Governors
General Conference

GOV/2017/28-GC(61)/11
Date: 28 July 2017

General Distribution
Original: English

For official use only

Item 15 of the Conference's provisional agenda
(GC(61)/1 and Add.1)

Measures to Strengthen International Cooperation in Nuclear, Radiation, Transport and Waste Safety

Report by the Director General

Summary

Pursuant to resolution GC(60)/RES/9, a report covering the following subjects is submitted to the Board of Governors and the General Conference for their consideration:

- The Agency's safety standards programme;
- Self-assessments and the Agency's peer review services;
- Nuclear installation safety;
- Radiation safety and environmental protection;
- Transport safety;
- The safety of spent fuel and radioactive waste management;
- Safety in uranium mining and processing, decommissioning and environmental remediation;
- The safe management of radioactive sources;
- Education, training and knowledge management in nuclear, radiation, transport and waste safety;
- 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.

Measures to Strengthen International Cooperation in Nuclear, Radiation, Transport and Waste Safety

Report by the Director General

A. Introduction

1. This report has been produced for the sixty first regular session (2017) of the General Conference in response to resolution GC(60)/RES/9, 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 2016 to 30 June 2017.

2. The Agency continued its efforts to maintain and strengthen nuclear, radiation, transport and waste safety, and emergency preparedness and response, focusing, inter alia, on the technical areas and geographical regions where the need for such efforts is greatest. The Agency implemented numerous activities to assist Member States embarking on a nuclear power programme in establishing or strengthening their safety infrastructure and regulatory framework as well as building competency in several areas related to the safety of nuclear installations.[1]

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: the CNS in Section D; the Joint Convention in Section G; and the Early Notification and Assistance Conventions in Section K.[2]

4. The Agency continued to provide legislative assistance to its Member States to support the development of adequate national legal frameworks and adherence to the relevant international legal instruments. Specific bilateral legislative assistance was provided to 20 Member States through written comments and advice on drafting national nuclear legislation. Assistance was also provided to Member States more broadly in gaining an understanding of the relevant international legal instruments through awareness missions and workshops conducted in seven Member States. The sixth

[1] This relates to operative paragraphs 1 and 3 of resolution GC(60)/RES/9.

[2] This relates to operative paragraphs 18, 19, 20 and 21 of resolution GC(60)/RES/9.

session of the Nuclear Law Institute was held in Baden, Austria, in October 2016, and was attended by 62 participants from 58 Member States. The two-week course aims to enhance knowledge of nuclear law as well as to draft, amend or review their national nuclear legislation. The Agency held three sub-regional workshops on nuclear law: one for Member States of the Asia and the Pacific region in Jordan in December 2016, one for African Countries in Tanzania, in March 2017, and one for English-speaking Member States of the Latin America and Caribbean region in Belize in April 2017.[3]

5. The sixth Treaty Event took place during the 60th regular session of the Agency's General Conference, and 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 and civil liability for nuclear damage.[4]

6. In March 2017, a report by the Director General containing the draft *Nuclear Safety Review 2017* was submitted to the Board of Governors and the final version of the *Nuclear Safety Review*, prepared in the light of discussions at the Board of Governors is provided as an information document at the 61st regular session of the Agency's General Conference. The *Nuclear Safety Review 2017* includes the global trends and the Agency's activities in 2016. It also presents priorities and related activities for 2017 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 2018–2019.[5]

7. Three Member States nominated a national Radiation Safety Information Management System (RASIMS) coordinator for the first time: Barbados, Nepal and Vanuatu. Twelve Member States nominated replacement national RASIMS coordinators. Ninety-two Member States updated their radiation safety infrastructure profiles. A workshop for national RASIMS coordinators from the Latin America and the Caribbean region was held in Vienna in November 2016. During the workshop, a test version of the RASIMS 2.0 web-based platform was presented and it received positive feedback from the participants.[6]

8. The Agency continued its cooperation with the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO). The Agency organized two FORO Steering Committee meetings in Santiago de Chile, Chile, in January 2017, and in Buenos Aires, Argentina, in June-July 2017. Seven additional meetings were conducted under the FORO extrabudgetary programme. The topics covered included: application of a risk matrix to new radiotherapy techniques; development of competencies in medical and industrial applications in regulatory bodies; regulatory practices for shielding for cyclotrons; implementation of the clearance concept and criteria for small nuclear installations handling radioactive waste; and maintenance of the FORO web-based information technology platform (RED). The Agency also made available in English two Technical Documents (TECDOCs) developed jointly with the FORO entitled *Guidelines on Devising a Programme for Competence Acquisition and Development among Nuclear Regulators* (IAEA-TECDOC-1794) and *Application of the Risk Matrix Method to Radiotherapy* (IAEA-TECDOC-1685). The Agency participated in two meetings of the European Nuclear Safety

[3] This relates to operative paragraphs 22, 30 and 112 of resolution GC(60)/RES/9.

[4] This relates to operative paragraphs 22 and 30 of resolution GC(60)/RES/9.

[5] This relates to operative paragraph 4 of resolution GC(60)/RES/9.

[6] This relates to operative paragraph 9 of resolution GC(60)/RES/9.

Regulators Group (ENSREG) in Belgium in November 2016 and June 2017 to exchange information in areas of mutual interest such as nuclear safety and radioactive waste management.[7]

9. Over 100 participants attended the Global Nuclear Safety and Security Network (GNSSN) Plenary Meeting, which took place during the 60th regular session of the Agency's General Conference in September 2016. The GNSSN Steering Committee met in Vienna in December 2016 and May 2017 and advised the Agency, inter alia, on capacity building methodologies and nuclear safety knowledge management to sustain national programmes for safety. The European and Central Asian Safety Network (EuCAS) was established during the 60th regular session of the Agency's General Conference in September 2016. EuCAS provides a collaboration platform and facilitates communication amongst its 22 member organizations from 20 Member States.[8]

10. The Agency is developing a knowledge management web portal on lessons learned from the Fukushima Daiichi accident to facilitate the exchange of lessons and relevant practices among Member States and international organizations. Two consultancy meetings took place in Vienna in December 2016 and May 2017 to identify a suitable software and system for categorization of observations and lessons for the web-based portal.[9]

11. In July 2016, the Director General received a letter from the Chairman of the International Nuclear Safety Group (INSAG) providing a perspective on current emerging safety issues. The letter addressed the institutional failures that can constitute the root cause of nuclear accidents and was made available to Member States at the 60th regular session of the Agency's General Conference as document GC(60)/INF/10. In April 2017, the Agency published INSAG's report entitled E*nsuring Robust National Nuclear Safety Systems — Institutional Strength in Depth* (INSAG Series No. 27). This report refers to the three important institutional subsystems — the industry, regulator and stakeholders — and recommends a careful analysis of the institutional subsystems and of their interfaces, as well as the correction of any weaknesses as a means to enhance safety.[10]

12. The Agency is revising the guidance associated with leadership and management for safety, including safety culture, to support the implementation of the safety requirements contained in *Leadership and Management for Safety* (IAEA Safety Standards Series No. GSR Part 2). The Safety Report *Continuously Improving Culture for Safety for Nuclear Installations* was submitted for publication.[11]

13. The Agency held five consultancy meetings in Vienna in October and December 2016 and in February, April and June 2017 to develop the concept, curriculum, syllabus and case studies for the pilot International School of Nuclear and Radiological Leadership for Safety. The School, aimed at early to mid-career professionals and based on practical learning, will address leadership for safety in nuclear and radiation safety, including safety culture, and nuclear security during normal and emergency situations.[12]

---

[7] This relates to operative paragraphs 10, 11 and 113 of resolution GC(60)/RES/9.

[8] This relates to operative paragraphs 10, 17 and 113 of resolution GC(60)/RES/9.

[9] This relates to operative paragraphs 13 and 113 of resolution GC(60)/RES/9.

[10] This relates to operative paragraph 28 of resolution GC(60)/RES/9.

[11] This relates to operative paragraphs 5 and 35 of resolution GC(60)/RES/9.

[12] This relates to operative paragraphs 5, 7, 8, 35 and 112 of resolution GC(60)/RES/9 and operative paragraphs B.3.3, B.3.5 and C.3 of resolution GC(60)/RES/12.

14. The Agency conducted four Safety Culture Continuous Improvement Process (SCCIP) missions, one in Argentina in September 2016, two in the Russian Federation in April 2017 and one in Brazil in May 2017. The Agency held a consultancy meeting in Vienna in May 2017 to revise SCCIP materials based on experience from implementation. A specific questionnaire for self-assessment of safety culture for regulatory bodies of nuclear installations was developed and piloted by Member State experts. The Agency conducted an assistance mission on safety culture assessment in the Netherlands in June 2017.[13]

15. The Agency held four workshops in the Republic of Korea in September 2016, in the United States of America in August 2016 and in Vienna in September and October 2016 to promote a harmonized international approach to leadership and management for safety and safety culture and to assist Member States with the application of the relevant safety standards.[14]

16. The Agency held a consultancy meeting in Vienna in January 2017 to prepare an IAEA TECDOC on national practices for fostering safety culture within the regulatory body and regulatory oversight of licensee's safety culture. The Agency held two consultancy meetings in Vienna in July and November 2016 to develop a TECDOC on regulatory oversight of human and organizational factors.[15]

17. In June 2017 the Agency held the International Conference on Topical Issues in Nuclear Installation Safety: Safety Demonstration of Advanced Water Cooled Nuclear Power Plants. The conference was attended by more than 270 participants from 46 Member States and 5 international organizations. The conference fostered the exchange of information on latest approaches, advances and challenges in the demonstration of safety of nuclear power plants (NPPs) to be licensed and constructed in the near future.[16]

18. The Agency continued to assist Member States operating, expanding or embarking on a nuclear power programme in establishing or enhancing their national safety infrastructure, particularly in the governmental, legal and regulatory framework. More than 30 national, regional and interregional activities were conducted for building competency in the regulatory functions and management for safety including safety culture.[17]

B. The Agency's Safety Standards Programme

19. Two Safety Requirements were issued: *Safety of Research Reactors* (IAEA Safety Standards Series No. SSR-3) and *Leadership and Management for Safety* (IAEA Safety Standards Series No. GSR Part 2). Two Safety Guides were issued: *Predisposal Management of Radioactive Waste from*

---

[13] This relates to operative paragraphs 5, 8 and 112 of resolution GC(60)/RES/9 and operative paragraphs B.3.2, B.3.3, B.3.5 and C.3 of resolution GC(60)/RES/12.

[14] This relates to operative paragraph 5 of resolution GC(60)/RES/9.

[15] This relates to operative paragraph 5 of resolution GC(60)/RES/9.

[16] This relates to operative paragraph 13 of resolution GC(60)/RES/9 and operative paragraph B.1.9 of resolution GC(60)/RES/12.

[17] This relates to operative paragraphs 5 and 15 of resolution GC(60)/RES/9.

Nuclear Fuel Cycle Facilities (IAEA Safety Standards Series No. SSG-41), and *Safety of Nuclear Fuel Reprocessing Facilities* (IAEA Safety Standards Series No. SSG-42).[18]

20. The Commission on Safety Standards (CSS) endorsed draft Safety Requirements entitled *Safety of Nuclear Fuel Cycle Facilities* (DS478) and five draft Safety Guides for publication: *Radiation Protection of the Public and the Environment* (DS432); *Prospective Radiological Environmental Impact Assessment for Facilities and Activities* (DS427); *Regulatory Control of Radioactive Discharges to the Environment* (DS442); *Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities* (DS452); and *Ageing Management and Programme for Long Term Operation of Nuclear Power Plants* (DS485).[19]

21. The CSS met in Vienna in November 2016 and in April 2017. The five Safety Standards Committees met twice, in Vienna in November 2016 and June 2017. During the meetings in November 2016, a joint session of the Emergency Preparedness and Response Standards Committee (EPReSC) and the Waste Safety Standards Committee (WASSC) was held.[20]

22. The Interface Group, which gathers chairs of the Safety Standards Committees and the Nuclear Security Guidance Committee and is responsible for dealing with safety–security interfaces among IAEA Safety Standards Series and IAEA Nuclear Security Series publications, continued its activities to facilitate consultations between the experts involved. The Interface Group was consulted on safety-security interfaces in ten publications following a recommendation from the Secretariat's Coordination Committee on Safety Standards and Nuclear Security Series Publications.[21]

23. The Agency's Nuclear Safety and Security Online User Interface (NSS-OUI)[22] is fully operational and provides access to, and navigation through, the content of all the published Agency safety standards. The interface to enhance the collection of feedback is also fully operational. A new development project is ongoing to further enhance NSS-OUI functionalities, including the search capabilities. The NSS-OUI platform is being used to optimize the process for the revision of eight Safety Guides on NPP operational safety (IAEA Safety Standards Series Nos NS-G-2.2, NS-G-2.3, NS-G-2.4, NS-G-2.5, NS-G-2.6, NS-G-2.7, NS-G-2.8 and NS-G-2.14).[23]

24. The Agency follows the activities of the International Commission on Radiological Protection (ICRP) as an observer in the ICRP committees and participates 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) on the development of safety standards and technical guidance addressing regulatory control of discharges, radiological environmental impact assessment and radiation protection of the public and the environment. The Agency was involved as an observer in the expert group that developed Annex A to the 2016 UNSCEAR report entitled *Methodology for Estimating Public Exposures due to Radioactive Discharges*. This Annex to the UNSCEAR report was published in January 2017.[24]

---

[18] This relates to operative paragraph 35 of resolution GC(60)/RES/9.

[19] This relates to operative paragraph 35 of resolution GC(60)/RES/9.

[20] This relates to operative paragraphs 35 and 39 of resolution GC(60)/RES/9.

[21] This relates to operative paragraphs 7 and 15 of resolution GC(60)/RES/9.

[22] See https://nucleus-apps.iaea.org/nss-oui.

[23] This relates to operative paragraphs 35 and 38 of resolution GC(60)/RES/9.

[24] This relates to operative paragraph 36 of resolution GC(60)/RES/9.

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

25. Nine Integrated Regulatory Review Service (IRRS) missions were conducted in Belarus in October 2016, Cyprus in February 2017, Estonia in September 2016, Guatemala in February 2017, Italy in November 2016, Kenya in July 2016, Nigeria in April 2017, Poland in June 2017 and South Africa in December 2016. Two IRRS follow-up missions were conducted in China in August 2016 and the Czech Republic in May 2017. Ten IRRS preparatory meetings took place in Belgium in May 2017, Botswana in March 2017, Cyprus in July 2016, the Czech Republic in November 2016, France in May 2017, Greece in March 2017, Jordan in April 2017, the former Yugoslav Republic of Macedonia in June 2017, Poland in March 2017 and Romania in April 2017. Three IRRS information meetings took place in Argentina in April 2017, Austria in May 2017 and Germany in November 2016.[25]

26. The Agency held two training courses for future IRRS reviewers in Vienna, in December 2016 in the area of radiation safety, and in January 2017 in the area of nuclear safety.[26]

27. The Agency held a Technical Meeting in Vienna in February 2017 to discuss the revision of the IRRS guidelines taking into account experience and lessons learned from past IRRS missions as well as revisions of the Agency's safety standards in the light of the Fukushima Daiichi accident.[27]

28. The Agency has made available on the GNSSN platform[28] the *Analysis of IRRS missions to Members States with operating NPPs 2006-2016*. Between 2006 and 2016, the Agency conducted 30 missions and 18 follow-up missions, involving more than 400 peer reviewers.[29]

29. The Agency held two national seminars on the Self-Assessment of Regulatory Infrastructure for Safety (SARIS) tool in Spain in November 2016 and Argentina in April 2017 in preparation for IRRS missions. The SARIS tool was revised. The number of questions was reduced by 75 % and the core set of questions aligned with the modules of the IRRS. The updated version of the software was released in February 2017.[30]

30. The Agency conducted six Operational Safety Review Team (OSART) missions to five NPPs in operation in Canada in September 2016, Finland in February 2017, France in October 2016, Romania in November 2016 and Slovenia in May 2017; and to one NPP in the commissioning phase in China in January 2017. Eight OSART follow-up missions were conducted in Hungary in October 2016, France in November and December 2016 and in February 2017, the Netherlands in December 2016, the United Kingdom in April 2017, the Russian Federation in May 2017 and Canada in May 2017.[31]

31. The Agency prepared the OSART Working Notes Outlines in the five official Agency languages and posted them on the Agency's OSART collaborative website in September 2016. The Agency revised and harmonized OSART training materials in line with *OSART Guidelines: 2015*

---

[25] This relates to operative paragraphs 26, 41 and 42 of resolution GC(60)/RES/9.

[26] This relates to operative paragraph 41 of resolution GC(60)/RES/9.

[27] This relates to operative paragraph 44 of resolution GC(60)/RES/9.

[28] See https://gnssn.iaea.org/regnet/irrs/Pages/IRRS_pub_docs.aspx.

[29] This relates to operative paragraphs 3, 41 and 44 of resolution GC(60)/RES/9.

[30] This relates to operative paragraphs 43 and 44 of resolution GC(60)/RES/9.

[31] This relates to operative paragraph 41 of resolution GC(60)/RES/9 and operative paragraphs B.3.1, B.3.2 and B.3.8 of resolution GC(60)/RES/12.

Edition (IAEA Services Series No. 12 (Rev. 1)) and developed additional training materials to support self-assessment of operational safety.[32]

32. The OSART Mission Results database makes good practices and lessons learned from OSART missions available to Member States with existing, or embarking on, nuclear power programmes. More than 80 recommendations and suggestions for NPP operational safety improvements were made by the OSART teams and approximately 30 good practices were identified in the area of operational safety. Member States provided more than 85 experts in support of the OSART missions.[33]

33. The Agency conducted four Integrated Safety Assessment of Research Reactors (INSARR) missions in Jamaica in June 2017, Jordan in December 2016, Kazakhstan in February 2017 and the Netherlands in August 2016. A preparatory INSARR mission was conducted in Norway in April 2017. Two follow-up INSARR missions were conducted in Malaysia in July 2016 and Turkey in April 2017.[34]

34. The Agency conducted four preparatory Site and External Events Design (SEED) review service missions in Belarus in July 2016, the Islamic Republic of Iran in October 2016, France in August 2016 and the Republic of Korea in March 2017. SEED missions were conducted in Belarus in January 2017, Indonesia in March 2017, Jordan in November 2016, Japan in October 2016, Tunisia in September 2016 and Uganda in May 2017. The Agency also conducted a SEED workshop in Sri Lanka in August 2016 on site selection and site evaluation for nuclear installations and a SEED workshop in Pakistan in February 2017 on probabilistic seismic hazard assessment (PSHA).[35]

35. The Agency conducted six Safety Aspects of Long Term Operation (SALTO) peer review missions in Argentina in September 2016, Armenia in December 2016, Belgium in February 2017, Bulgaria in July 2016, China in June 2017 and Sweden in November 2016, and three SALTO follow-up missions in Belgium in December 2016, the Czech Republic in November 2016 and Mexico in January 2017. Six SALTO workshops and preparatory meetings were held in Belgium in July 2016, China in September 2016, Finland in November 2016, Mexico in July 2016, Slovenia in August 2016 and Ukraine in April 2017. Member States provided more than 70 experts in support of the SALTO missions and related workshops.[36]

36. The Agency prepared an overview of SALTO missions performed between 2005 and 2015 in a working document entitled *SALTO Missions' Highlights 2005–2015: Long Term Operation Safety Practices in Nuclear Power Plants*[37].[38]

37. The Agency's Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) was established and draft guidelines were produced. The Agency provided Member States with information on ARTEMIS as part of its activities, in

---

[32] This relates to operative paragraphs 44 and 45 of resolution GC(60)/RES/9 and operative paragraphs B.3.1 and B.3.8 of resolution GC(60)/RES/12.

[33] This relates to operative paragraphs 44 and 45 of resolution GC(60)/RES/9.

[34] This relates to operative paragraphs 16 and 41 of resolution GC(60)/RES/9.

[35] This relates to operative paragraphs 3 and 41 of resolution GC(60)/RES/9.

[36] This relates to operative paragraphs 16, 41, 42 and 52 of resolution GC(60)/RES/9 and operative paragraphs B.3.2 and B.3.4 of resolution GC(60)/RES/12.

[37] See https://www.iaea.org/sites/default/files/17/01/salto_mission_highlights_2005-2015.pdf.

[38] This relates to operative paragraphs 43 and 45 of resolution GC(60)/RES/9 and operative paragraphs B.3.2 and B.3.4 of resolution GC(60)/RES/12.

particular during two workshops held in Vienna in July 2016 attended by 42 representatives from 23 Member States, and in April 2017 attended by 96 representatives from 49 Member States, and through its participation in the ENSREG meeting in Belgium in June 2017.[39]

38. The Agency conducted one Emergency Preparedness Review (EPREV) mission in Indonesia in September 2016 and two preliminary EPREV missions in Belarus in January 2017 and Slovenia in April 2017.[40]

39. The Agency conducted Education and Training Appraisal (EduTA) missions to assess education and training in radiation safety in Cuba in October 2016, Georgia in November 2016 and the United Arab Emirates in February 2017.[41]

40. The Agency continued to assess the overall structure, effectiveness and efficiency of peer reviews and advisory services in the areas of nuclear safety and security and emergency preparedness through the Peer Review and Advisory Services Committee (PRASC). The Agency described progress on this work and facilitated discussion on this topic at various international events, including the plenary meeting of the GNSSN in Vienna in September 2016 and the Technical and Scientific Support Organization (TSO) Forum Steering Committee in April 2017. The Agency held a consultancy meeting in Vienna in June 2017 to seek expert feedback on the work carried out by PRASC in preparation for a Technical Meeting for exchange of information with Member States in August 2017.[42]

D. Nuclear Installation Safety

41. 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 Director General to Member States, as well as through technical cooperation projects. In the reporting period, Madagascar, Myanmar and the Niger became new Contracting Parties to the CNS.[43]

42. The Agency organized three Officers' Meeting in Vienna in October 2016 and in February and March 2017 in preparation for the Seventh Review Meeting of the Contracting Parties to the CNS (hereinafter referred to as the Seventh Review Meeting). The Agency organized the Seventh Review Meeting in Vienna in March–April 2017. The meeting was attended by more than 900 representatives from 77 Contracting Parties. The Contracting Parties reviewed national reports in Country Group sessions. Open-Ended Working Group (OEWG) sessions were held to discuss proposals submitted by Contracting Parties. The OEWG produced six recommendations addressing, inter alia, the evaluation of the effectiveness of the changes to the review process, topical sessions during future Review Meetings, organization of CNS educational workshops to, inter alia, encourage participation and

---

[39] This relates to operative paragraph 11 of resolution GC(60)/RES/9 and operative paragraph B.1.27 of resolution GC(60)/RES/12.

[40] This relates to operative paragraph 41 of resolution GC(60)/RES/9.

[41] This relates to operative paragraph 41 of resolution GC(60)/RES/9.

[42] This relates to operative paragraphs 43, 44 and 45 of resolution GC(60)/RES/9.

[43] This relates to operative paragraphs 15, 18 and 46 of resolution GC(60)/RES/9.

provide assistance in meeting the obligations under the Convention, the possibility of organizing video conferences for certain Country Group sessions, and streaming of parts of plenary sessions on the Agency's website. All recommendations were agreed by consensus.[44]

43. In accordance with a decision of Contracting Parties contained in the Vienna Declaration on Nuclear Safety, the agenda of the Seventh Review Meeting included a peer review of the incorporation of appropriate technical criteria and standards used by Contracting Parties for addressing the principles of the Vienna Declaration in national requirements and regulations. A majority of Contracting Parties stated that they currently reflect the principles in their national requirements or will address them when embarking on a nuclear power programme. A majority of Contracting Parties with nuclear power programmes did not face or expect issues in addressing the principles of the Vienna Declaration. Few of the Contracting Parties reported some technical issues as well as the lack of guidance in addressing the principles of the Vienna Declaration to their existing fleet. Contracting Parties reaffirmed that the principles contained in the Vienna Declaration should continue to be reflected in the actions of Contracting Parties to strengthen nuclear safety.[45]

44. During the Seventh Review Meeting, a session was held to discuss how to secure improved participation by non-NPP and embarking countries, including the particular challenges faced by these countries in complying with the obligations of the CNS. The Contracting Parties found that key challenges included limited national government support or commitment due to competing demands for resources and, in some instances, a lack of understanding of the obligations that Contracting Parties have regarding the Convention review process. Measures identified to address these issues included enhanced support through the GNSSN and its regional and thematic networks. Contracting Parties proposed that these networks should be encouraged to organize workshops and expert missions to enhance awareness of CNS obligations amongst national policy and decision makers.[46]

45. The Agency produced a draft revision of the Safety Guide *A System for the Feedback of Experience from Events in Nuclear Installations* (IAEA Safety Standards Series No. NS-G-2.11) (DS479) based on Member States' comments, which was approved by the Secretariat's Coordination Committee on Safety Standards and Nuclear Security Series Publications in September 2016.[47]

46. The International Reporting System for Operating Experience (IRS), which is jointly operated by the IAEA and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), facilitates the exchange of information on nuclear incidents and accidents in Member States. Eighty-four reports were submitted by participating Member States. The IAEA held the Technical Meeting to Exchange Experience on Recent Events at Nuclear Power Plants, and the Meeting of the Technical Committee of IRS National Coordinators, both in Vienna in October 2016, to share assessments and lessons learned from recently reported incidents and to identify common trends. The meeting also considered ways of improving the operation of the IRS.[48]

47. The Agency held a technical cooperation regional workshop on the effective management of operational experience feedback programmes in Ukraine in February 2017. Four workshops on operational experience feedback programmes were conducted under the technical cooperation national

---

[44] This relates to operative paragraphs 19 and 48 of resolution GC(60)/RES/9.

[45] This relates to operative paragraphs 19, 46 and 48 of resolution GC(60)/RES/9.

[46] This relates to operative paragraphs 18, 19 and 48 of resolution GC(60)/RES/9.

[47] This relates to operative paragraphs 35 and 50 of resolution GC(60)/RES/9.

[48] This relates to operative paragraphs 13 and 50 of resolution GC(60)/RES/9.

projects in Belarus in September 2016, Pakistan in December 2016, and the Russian Federation in May 2017 and June 2017. The Agency conducted a national training course on root cause analysis in Pakistan in September 2016.[49]

48. The Agency supports cooperation on subjects related to the evaluation and enhancement of NPP operational safety with international organizations (e.g. the OECD/NEA, the World Association of Nuclear Operators (WANO), the Institute of Nuclear Power Operations (INPO), the World Nuclear Association (WNA) and the European Union). The Agency held a meeting in Vienna in September 2016 to strengthen its cooperation with WANO and the coordination of the peer reviews was improved by sharing resources across WANO peer reviews and OSART missions.[50]

49. The Agency held six International Generic Ageing Lessons Learned (IGALL) working group meetings in Canada in September 2016, the Czech Republic in May 2017, France in November 2016, Hungary in April 2017, Slovenia in March 2017 and Spain in November 2016, attended by representatives from 29 Member States and 3 international organizations. Representatives from 29 Member States attended the IGALL Phase 3 Steering Committee meeting held in Vienna in December 2016.[51]

50. The Agency conducted 14 ageing management and long term operation workshops in Argentina in July 2016, and in March and April 2017, Armenia in August and September 2016, and in April 2017, Brazil in October and November 2016, and in May 2017, Bulgaria in January 2017, France in October 2016, the Islamic Republic of Iran in May 2017, Pakistan in November 2016 and Romania in October 2016. The Agency also conducted two expert missions in support of Member States' ageing management and long term operation programmes in Brazil in October 2016 and Mexico in June 2017.[52]

51. The Agency held a preparatory meeting in July 2016 for an ageing management review mission in Belgium. The meeting discussed the methodology for an ageing management peer review mission of research reactors based on SALTO guidelines. The Agency also held a training workshop on ageing management for research reactors in the Islamic Republic of Iran in August 2016.[53]

52. The Agency held two workshops on periodic safety reviews (PSRs), one national workshop in China in September 2016 and one regional workshop in Vienna in November 2016. The purpose of these workshops was to improve awareness of the Agency's safety standards related to NPPs, safety factors included in the PSR, as well as Member States' experience and practices regarding PSRs for NPPs.[54]

53. In July 2016, the Agency published a TECDOC entitled *Seismic Hazard Assessment in Site Evaluation for Nuclear Installations: Ground Motion Prediction Equations and Site Response* (IAEA-TECDOC-1796) and a Safety Report entitled *Diffuse Seismicity in Seismic Hazard Assessment for Site Evaluation of Nuclear Installations* (Safety Reports Series No. 89) to support the

---

[49] This relates to operative paragraphs 16 and 50 of resolution GC(60)/RES/9.

[50] This relates to operative paragraph 51 of resolution GC(60)/RES/9.

[51] This relates to operative paragraphs 10 and 52 of resolution GC(60)/RES/9.

[52] This relates to operative paragraphs 16 and 52 of resolution GC(60)/RES/9 and operative paragraphs B.3.2 and B.3.4 of resolution GC(60)/RES/12.

[53] This relates to operative paragraph 52 of resolution GC(60)/RES/9 and operative paragraph B.3.4 of resolution GC(60)/RES/12.

[54] This relates to operative paragraphs 35 and 53 of resolution GC(60)/RES/9.

implementation of the Safety Guide *Seismic Hazards in Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSG-9).[55]

54. In April 2017, the Agency published two Safety Reports entitled *Safety Aspects of Nuclear Power Plants in Human Induced External Events: General Considerations* (Safety Reports Series No. 86) and *Safety Aspects of Nuclear Power Plants in Human Induced External Events: Margin Assessment* (Safety Reports Series No. 88). These Safety Reports support the implementation of the Safety Guides *External Human Induced Events in Site Evaluation for Nuclear Power Plants* (IAEA Safety Standards Series No. NS-G-3.1) and *External Events Excluding Earthquakes in the Design of Nuclear Power Plants* (IAEA Safety Standards Series No. NS-G-1.5). The Agency also published in July 2016 a TECDOC entitled *Volcanic Hazards Assessments for Nuclear Installations: Methods and Examples in Site Evaluation* (IAEA-TECDOC-1795) to support the implementation of Safety Guide *Volcanic Hazards in Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSG-21). The Agency has submitted for publication two Safety Reports provisionally entitled *Safety Aspects of Nuclear Power Plants in Human Induced External Events: Assessment of Structures* and *Consideration of External Hazards in Probabilistic Safety Assessment for Single Unit and Multi-Unit Nuclear Power Plants.* The Agency has also submitted for publication a TECDOC provisionally entitled *Seismic Instrumentation Systems and their Use in Post-Earthquake Decision Making at NPP*).[56]

55. The Agency expanded its online External Event Notification System from earthquakes and seismically-induced tsunamis to cover extreme natural phenomena, such as floods, tsunamis, volcanic eruptions, landslides, fires, tropical storms and severe meteorological events. The system supports the Agency's Incident and Emergency Centre on a round-the-clock basis and assists the decision-making process for responding to natural events.[57]

56. The Agency conducted a Technical Meeting on Lessons Learned and Safety Improvements Related to External Hazards Based on the IAEA Fukushima Report in Vienna in November 2016. This Technical Meeting was attended by representatives of 30 Member States.[58]

57. The Agency continued supporting Member States in the application of the Code of Conduct on the Safety of Research Reactors and the Agency safety standards. Regional meetings and workshops were held on the application of the Code for the Africa region in Egypt in November 2016 focusing on the development of safety documents and regulatory review and assessment, and for the Latin America region in Colombia in February 2017 focusing on training and qualification programmes for research reactor operations personnel and on human and organizational factors.[59]

58. The Agency held the International Meeting on Application of the Code of Conduct on the Safety of Research Reactors in Vienna in May 2017, attended by representatives from 40 Member States. During the meeting, the Agency facilitated the dissemination of results from the self-assessments of Member States in applying the provisions of the Code and implementing safety

---

[55] This relates to operative paragraph 35 of resolution GC(60)/RES/9.

[56] This relates to operative paragraphs 35 and 54 of resolution GC(60)/RES/9.

[57] This relates to operative paragraphs 12 and 56 of resolution GC(60)/RES/9.

[58] This relates to operative paragraphs 13 and 57 of resolution GC(60)/RES/9.

[59] This relates to operative paragraphs 10 and 24 of resolution GC(60)/RES/9.

improvements. The meeting acknowledged the progress achieved in Member States in applying the provisions of the Code.[60]

59. The Agency conducted a workshop on safety reassessments of research reactors following feedback from the Fukushima Daiichi accident in Vienna in September 2016 and a workshop on establishing an integrated management system for research reactors in Vienna in November 2016. The Agency also conducted a regional workshop on safety of experiments in research reactors in the Republic of Korea in March 2017.[61]

60. The Agency conducted research reactor safety expert missions in Indonesia in July 2016, Kazakhstan in November 2016, Morocco in June 2017 and Poland in July 2016. These expert missions supported safety enhancements in areas such as instrumentation and control systems, coolant monitoring systems, and review and assessment of safety documents for research reactor configuration modifications and research experiments.[62]

61. In August 2016, the Agency published a TECDOC entitled *Management of the Interface between Nuclear Safety and Security for Research Reactors* (IAEA-TECDOC-1801). This TECDOC provides guidance and builds upon Member States' experience in managing the interface between safety and security throughout the lifetime of the research reactor.[63]

62. The Agency continued to support Member States planning to establish a first or a new research reactor by conducting workshops on specific considerations and milestones for a new research reactor project in Vienna in October 2016, on the research reactor milestones approach and self-assessment of infrastructure in Azerbaijan in February 2017, and on the role of research reactors in providing support to NPPs in Kenya in March 2017. The Agency also conducted an expert mission on the research reactor feasibility study and initiation of the licensing process in South Africa in January 2017, and expert missions to review the feasibility study, strategic plan and infrastructure for a new research reactor in the Philippines in December 2016 and in Thailand in May 2017. The Agency held workshops for the Philippines and Viet Nam in Vienna in March 2017 and in July 2016 respectively to provide assistance with developing the technical aspects of their national safety regulations for a new research reactor project.[64]

63. The Agency held workshops on the safety of nuclear fuel cycle facilities, including a joint workshop with the OECD/NEA Committee on the Safety of Nuclear Installations on developments in fuel cycle facilities after the Fukushima Daiichi accident in Japan in November 2016, a workshop on safety analysis and documentation for nuclear fuel cycle facilities in Vienna in November 2016, a workshop on operational radiation protection and waste management for nuclear fuel cycle facilities in Vienna in March 2017, and a workshop on regulations for a spent fuel storage pool in Malaysia in December 2016.[65]

64. The Incident Reporting System for Research Reactors (IRSRR) and the Fuel Incident Notification and Analysis System (FINAS) facilitate the exchange of information on nuclear incidents and accidents in Member States. The Agency held a Technical Meeting for the coordinators of FINAS

---

[60] This relates to operative paragraphs 13, 24 and 49 of resolution GC(60)/RES/9.

[61] This relates to operative paragraphs 49, and 55 of resolution GC(60)/RES/9.

[62] This relates to operative paragraphs 16, 24 and 53 of resolution GC(60)/RES/9.

[63] This relates to operative paragraphs 7 and 15 of resolution GC(60)/RES/9.

[64] This relates to operative paragraph 3 of resolution GC(60)/RES/9.

[65] This relates to operative paragraphs 10, 16 and 55 of resolution GC(60)/RES/9.

in France in October 2016. The purpose of this meeting was to share assessment results and lessons learned from recently reported incidents and to identify common trends. The meeting also considered ways of improving the operation of the FINAS.[66]

65. The Agency held three meetings of the regional advisory safety committees for research reactors in Norway in August 2016 for the Europe region, in Nigeria in August 2016 for the Africa region, and in the United States of America in October 2016 for the Asia and the Pacific region. These meetings facilitated the sharing of experiences on utilization and safety management of research reactors and focused on regional strategies for strengthening research reactor operating organizations.[67]

66. In August 2016, the Agency conducted a Technical Safety Review mission on the probabilistic safety assessment of the Dukovany NPP in the Czech Republic. The review was based on *Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-3) and *Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants* (IAEA Safety Standard Series No. SSG-4).[68]

67. The Agency held consultancy meetings in Vienna in October 2016 and February 2017 on criteria for diverse actuation systems. These meetings were held to assist the Agency in the development of technical documentation related to the implementation of the recently published Safety Guide *Design of Instrumentation and Control Systems for Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-39).[69]

68. In October 2016, the Agency conducted a Technical Meeting on Phenomenology and Technologies Relevant to In-Vessel Melt Retention and Ex-Vessel Corium Cooling, in China, attended by 63 representatives from 18 Member States. The Technical Meeting provided an opportunity to share latest research and development and strategies to improve severe accident management guidelines.[70]

69. The Agency held a Technical Meeting on Novel Design and Safety Principles of Nuclear Power Plants in Vienna in October 2016. The meeting was attended by 32 representatives from 21 Member States and 2 international organizations. The purpose of this meeting was to discuss the implementation of the design requirements in *Safety of Nuclear Power Plants: Design* (IAEA Safety Standard Series No. SSR-2/1 (Rev. 1)). The outcome of this meeting and two national workshops held in China in August 2016 and Jordan in July 2016 will assist the Agency in developing supporting documents regarding novel design and safety principles for NPPs.[71]

70. The Agency held a Technical Meeting on the Verification and Validation of Severe Accident Management Guidelines in Vienna in December 2016. The meeting was attended by representatives of 25 Member States and 1 international organization. The meeting provided a forum for the participants to share good practices on the verification and validation of severe accident management guidelines for both regulatory bodies and plant operators. The Agency held a workshop on the Understanding the Role of Severe Accident Management Guidelines (SAMGs) in Vienna in December 2016.

---

[66] This relates to operative paragraphs 12, 13 and 50 of resolution GC(60)/RES/9.

[67] This relates to operative paragraphs 10, 16, 50 and 55 of resolution GC(60)/RES/9.

[68] This relates to operative paragraphs 16, 35 and 60 of resolution GC(60)/RES/9.

[69] This relates to operative paragraphs 35 and 58 of resolution GC(60)/RES/9.

[70] This relates to operative paragraphs 13 and 59 of resolution GC(60)/RES/9.

[71] This relates to operative paragraphs 13, 35 and 57 of resolution GC(60)/RES/9.

The workshop provided a forum to share good practices and common understanding of SAMGs based on the Safety Guide Severe Accident Management Programmes for Nuclear Power Plants (IAEA Safety Standard Series No. NS-G-2.15) and to discuss the Agency's SAMG-D Toolkit.[72]

71. The Agency held a consultancy meeting in Vienna in February 2017 to assess the applicability of the requirements in *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1 (Rev. 1)) to small and medium sized or modular reactors (SMRs). The participants evaluated the application of these safety requirements to SMR designs including light water reactors, light water cooled floating reactors, and high temperature gas cooled reactors. The consultancy meeting produced a report which will be used as an input for the review of Agency safety standards to enhance their applicability to SMRs and a plan for a Technical Meeting on the same topic to be held in September 2017.[73]

72. The Agency organized two meetings of the Steering Committee of the Small Modular Reactor Regulators' Forum in Vienna in October 2016 and May 2017. The Steering Committee was briefed on progress made by each of the Forum's three Working Groups: the Emergency Planning Zone Size Working Group; the Defence in Depth Working Group; and the Graded Approach Working Group; and reviewed the final Working Group reports. The Steering Committee approved the publication of the report of the Forum's activities over the previous two years, including the three Working Group reports, and adopted new Terms of Reference for future work of the Forum. The Forum's future work will focus on defining the attributes of SMRs that differ from conventional NPP reactors as well as identifying, understanding and addressing key regulatory challenges related to licensing SMRs.[74]

73. The Agency continued to support the national safety infrastructure of Member States expanding their existing nuclear power programmes or planning to embark on such a programme. National, regional and interregional workshops and training events were conducted in Algeria in September 2016, Vienna in December 2016, Belarus in December 2016 and January and June 2017, Egypt in October 2016, Ghana in November 2016, Indonesia in September 2016 and February 2017, Malaysia in August and November 2016, the Philippines in March 2017, Singapore in October 2016, the Sudan in November 2016, Thailand in February 2017, the United Arab Emirates in January 2017 and Viet Nam in July 2016.[75]

74. The Agency conducted four expert missions in Indonesia in July 2016 and in January 2017, Egypt in May 2017 and Thailand in May 2017 to provide guidance on regulatory infrastructure. The Agency organized scientific visits and fellowships for more than 50 staff members of regulatory bodies in countries embarking on nuclear power programmes.[76]

75. The Agency organized the annual plenary meeting of the Regulatory Cooperation Forum (RCF) in Vienna in September 2016, which was attended by 70 representatives of 27 RCF countries and other Member States. RCF representatives visited Poland in February 2017, Belarus in April 2017 and Jordan in May 2017 to discuss the support to be provided through the RCF. The Agency organized an RCF Steering Committee meeting in Belgium in June 2017, in cooperation with the European Commission. The meeting facilitated the exchange of information on relevant activities conducted

---

[72] This relates to operative paragraphs 13, 59 and 60 of resolution GC(60)/RES/9.

[73] This relates to operative paragraphs 35 and 61 of resolution GC(60)/RES/9.

[74] This relates to operative paragraphs 10, 26 and 57 of resolution GC(60)/RES/9 and operative paragraphs B.1.8 and B.4.13 of resolution GC(60)/RES/12.

[75] This relates to operative paragraphs 3, 15 and 16 of resolution GC(60)/RES/9 and operative paragraph B.3.1 of resolution GC(60)/RES/12.

[76] This relates to operative paragraphs 3, 16 and 112 of resolution GC(60)/RES/9.

under the RCF. An RCF workshop on regulatory control was held in Vienna in November 2016, attended by 13 representatives from 8 RCF countries.[77]

76. The Agency organized the 23rd annual meeting of the Forum of the State Nuclear Safety Authorities of the Countries Operating WWER Type Reactors (WWER Regulators' Forum) in the Russian Federation in July 2016. Representatives of several of the Forum's member countries (Bulgaria, China, the Czech Republic, Finland, Hungary, India, the Islamic Republic of Iran, the Russian Federation and Slovakia) as well as observers from Belarus and Germany participated in the meeting. The Forum discussed, amongst other relevant issues, national approaches to ageing management and long term operation of NPPs. It was decided to establish a new working group on ageing and long term operation of water cooled, water moderated power reactors (WWERs), led by the Russian Federation.[78]

77. The Agency organized the annual CANDU Senior Regulators' Meeting in Vienna in February 2017. The CANDU Senior Regulators Group discussed recent developments and relevant operational experience feedback and made proposals for further analysis by the community operating Canada deuterium–uranium (CANDU) reactors concerning regulatory decision making on long term operation and management of NPP nuclear and radiological emergency recovery actions.[79]

E. Radiation Safety and Environmental Protection

78. The IAEA–OECD/NEA Information System on Occupational Exposure (ISOE) Technical Centre collected data and annual reports from its members and invited two additional NPPs in China to become ISOE utility members.[80]

79. The functionality of the Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR) was improved to include data analysis and reporting functions.[81]

80. The outcomes of the 2014 International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers — Gaps, Challenges and Developments were published at the end of 2016 as *Occupational Radiation Protection Call-for-Action*, which includes nine actions identified as key areas during the International Conference. Several training packages were drafted for training events on occupational radiation protection. A national workshop was held in China in April 2017 to promote the Safety Guide entitled *Occupational Radiation Protection* (IAEA Safety Standards Series No. GSG-7).[82]

81. A draft Safety Report entitled *Occupational Radiation Protection in Uranium Mining and Processing Industry* was submitted for publication in April 2017. This was an output from the Third International Workshop on Occupational Radiation Protection in the Uranium Mining and Processing Industry, which was held in South Africa in May 2016 as a side event of the 14th International

---

[77] This relates to operative paragraphs 10, 26, 57 and 62 of resolution GC(60)/RES/9.

[78] This relates to operative paragraphs 10, 13, 26, 52 and 62 of resolution GC(60)/RES/9.

[79] This relates to operative paragraphs 10, 13, 26 and 62 of resolution GC(60)/RES/9.

[80] This relates to operative paragraph 64 of resolution GC(60)/RES/9.

[81] This relates to operative paragraph 65 of resolution GC(60)/RES/9.

[82] This relates to operative paragraphs 13 and 67 of resolution GC(60)/RES/9.

Congress of the International Radiation Protection Association. A draft Safety Report on *Radiation Protection and Management of NORM Residues in Industrial Use of Thorium* was submitted for publication in March 2017. A draft Safety Guide entitled *Management of Radioactive Residues from Uranium Production and Other NORM Activities* (DS459) was endorsed by the WASSC for distribution to Member States for comment in December 2016. A Technical Meeting on Application of the Graded Approach to Safety for Management of Naturally Occurring Radioactive Material Residues was held in Vienna in June 2017. The objective of the Technical Meeting was to provide a forum for sharing information and exchanging knowledge and experiences among the participating Member States.[83]

82. The Eighth International Symposium on Naturally Occurring Radioactive Material, NORM VIII, was held in Brazil in October 2016, and was attended by 180 representatives from 31 Member States. The Symposium was co-sponsored by the Agency and other international organizations. Member States' priorities and needs for radiation protection actions were identified, and experiences on radiation protection in relation to naturally occurring radioactive material were exchanged. A national workshop on radiation and industrial safety was held in Madagascar in January 2017. The workshop was co-sponsored by the Agency and the International Labour Organization.[84]

83. A side event was held during the 60th regular session of the Agency's General Conference in September 2016, entitled Global Challenges for Radiotherapy: Safe and Effective Use of New Technology. It addressed safety challenges in complex radiotherapy technology as well as barriers to its effective use, and Member States' needs for support in this area. The Agency cooperated in the organization of the Ibero-American Conference on Radiation Protection in Medicine held in Spain in October 2016. A central objective of this conference was to assess progress at regional and national levels in the implementation of the Bonn Call for Action. A Technical Meeting on Preventing Unintended and Accidental Medical Exposures in Radiology was held in Vienna in March 2017, and was attended by 52 representatives from 25 Member States. A plan for improving the prevention of unintended and accidental exposures in diagnostic radiology and image guided interventional procedures in Member States was prepared, taking into account the Bonn Call for Action.[85]

84. The Agency held two consultancy meetings in Vienna in January 2017 to prepare a draft Safety Report on radiation dose reporting and tracking in medical uses of ionizing radiation, and in February 2017 to prepare a draft Safety Report on radiation protection in dental radiology. These Safety Reports are being developed in cooperation with the World Health Organization (WHO).[86]

85. The Agency continued its efforts to update the Radiation Protection of Patients (RPOP) platform[87], which provides information and guidance on medical radiation protection. New information was added to the platform on an approximately monthly basis covering relevant events (meetings, conferences), new scientific publications, and training packages and webinars developed by the Agency. In particular, two new e-learning courses were uploaded to the platform, and a series of webinars was also held in English and Spanish. The annual number of page-views increased to 870 000 by the end of 2016.[88]

---

[83] This relates to operative paragraphs 13, 35 and 68 of resolution GC(60)/RES/9.

[84] This relates to operative paragraphs 16 and 69 of resolution GC(60)/RES/9.

[85] This relates to operative paragraphs 13 and 70 of resolution GC(60)/RES/9.

[86] This relates to operative paragraphs 35 and 71 of resolution GC(60)/RES/9.

[87] See rpop.iaea.org.

[88] This relates to operative paragraphs 13, 71 and 112 of resolution GC(60)/RES/9.

86. A training course on radiation safety in brachytherapy was held in Vienna in November 2016, and was attended by 30 representatives of 22 Member States. The training included information on significant events and errors that may occur in brachytherapy, on the safety systems that should be in place, on safety culture, and on the prevention of, and response to, events. The potential benefits of using safety reporting and learning systems in this area were highlighted.[89]

87. The Agency's activities to support the effective implementation of the International Basic Safety Standards in relation to occupational, public and medical exposures, and protection of the environment included the publication of 21 factsheets for decision makers[90]. Selected factsheets have been translated into Chinese, French, Russian and Spanish. Work is continuing to translate the full set of factsheets into all official Agency's languages.[91]

88. A Technical Meeting on the Implementation of the Requirements in the International Basic Safety Standards in Relation to Non-Medical Human Imaging was held in Vienna in January 2017. The meeting was attended by 35 participants from 28 Member States and from 2 international organizations. Participants shared their experiences with, and approaches to, the implementation of the requirements in the International Basic Safety Standards in relation to non-medical human imaging, in particular in relation to the justification of such practices and the optimization of protection and the safety of people who are undergoing such procedures. Issues such as exposure of minors and exposure without consent were also discussed.[92]

89. The Agency held a national workshop on occupational radiation protection under the International Basic Safety Standards in China in April 2017. The workshop was attended by more than 100 participants and promoted the application of the General Safety Guide *Occupational Radiation Protection* (IAEA Safety Standards Series No. GSG-7).[93]

90. The Agency published a TECDOC entitled *Status of Radon Related Activities in Member States Participating in Technical Cooperation Projects in Europe* (IAEA-TECDOC-1810). A national workshop on public exposure due to radon and radionuclides in building materials was held in Romania in January 2017, attended by 31 representatives from 7 national institutions. A Safety Report on the design and execution of representative indoor radon surveys has been initiated.[94]

91. A Workshop on Radionuclides in Food, Drinking Water and Non-food Commodities — Implementing the Requirements in the Basic Safety Standards was held in Argentina, in March 2017. The workshop, jointly organized by the Agency, the Food and Agriculture Organization of the United Nations (FAO), the Pan American Health Organization and the WHO, was attended by 46 representatives from 16 Member States and 2 non-Member States, Aruba and Saint Lucia. The participants included high level experts and senior staff from regulatory bodies, industry, research organizations and government ministries charged with the responsibility for establishing national

---

[89] This relates to operative paragraphs 5, 72 and 112 of resolution GC(60)/RES/9.

[90] See https://www-ns.iaea.org/standards/review-of-the-bss.asp?s=11&l=88.

[91] This relates to operative paragraph 63 of resolution GC(60)/RES/9.

[92] This relates to operative paragraphs 13, 63 and 73 of resolution GC(60)/RES/9.

[93] This relates to operative paragraphs 16, 63 and 73 of resolution GC(60)/RES/9.

[94] This relates to operative paragraphs 16 and 74 of resolution GC(60)/RES/9.

standards for radioactivity in food, drinking water and commodities that are traded, and for assessing compliance with such standards.[95]

92. A regional meeting to discuss current standards for radioactivity in food and drinking water was held in Indonesia in August 2016. The meeting was held jointly with the FAO and WHO, and was attended by 32 representatives from 21 Member States in the Asia and the Pacific region. Experience in managing food and drinking water during the recovery phase after NPP accidents and the need for establishing ongoing monitoring programmes for radioactivity were discussed in the context of the current relevant international standards. Most Member States reported having monitoring programmes for drinking water.[96]

93. The IAEA made a presentation on the challenges to implementing the current international standards relating to food and drinking water in existing exposure situations at the OECD/NEA International Workshop on Post-Accident Food Safety Science, which was held in Japan in November 2016. The Agency organized a side event entitled Radionuclides in Food: Standards, New National Guidance and Recent Developments as part of the 11th Session of the Codex Committee on Contaminants in Foods in Rio de Janeiro, Brazil, in April 2017. The side event was organized in cooperation with the FAO and with participation of the OECD/NEA.[97]

94. The Radiation Safety Standards Committee and WASSC approved a proposal for the revision of the Safety Guide entitled *Application of the Concepts of Exclusion, Exemption and Clearance* (IAEA Safety Standards Series No. RS-G-1.7) in November 2016. RS-G-1.7 will be superseded by two separate Safety Guides, one on the application of the concept of clearance (DS500) and one on the application of the concept of exemption (DS499). The Agency held a regional workshop in Bulgaria in January 2017 on clearance of materials and waste generated by decommissioning. This meeting provided information on existing practices and Member States' needs in relation to applying the concept of clearance.[98]

95. The second phase of the Modelling and Data for Radiological Impact Assessments programme, MODARIA II, was launched at a Technical Meeting held in Vienna in October–November 2016, attended by 145 participants from 47 Member States. MODARIA II is dedicated to the enhancement of capabilities in Member States for environmental modelling and radiological assessment of radiation exposures to people and the environment in planned, existing and emergency exposure situations.[99]

96. The Agency has initiated a TECDOC provisionally entitled *Guidance on Implementation of Remediation Strategies to Reduce Doses Following Deposition of Radionuclides*. This document is based, inter alia, on results from the Technical Meeting on Remediation Techniques and Strategies in Post-Accident Situations held in Vienna in June 2016. The TECDOC will support national authorities and agencies at various levels implementing protection strategies for existing exposure situations involving the management of areas affected by past nuclear or radiological events.[100]

97. The Agency participated in the 38th Consultative Meeting of Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter

---

[95] This relates to operative paragraphs 63 and 75 of resolution GC(60)/RES/9.

[96] This relates to operative paragraphs 63 and 75 of resolution GC(60)/RES/9.

[97] This relates to operative paragraph 75 of resolution GC(60)/RES/9.

[98] This relates to operative paragraphs 35, 76, 80 and 107 of resolution GC(60)/RES/9.

[99] This relates to operative paragraph 77 of resolution GC(60)/RES/9.

[100] This relates to operative paragraph 78 of resolution GC(60)/RES/9.

(London Convention) to present the history of the Agency's recommendations and guidance for the dumping at sea of low level radioactive waste material up until the point when that practice was banned in 1994. The Agency also participated in the annual meeting of the Radioactive Substances Committee (RSC) in Geneva in February 2017 to provide advice on the assessment of radiological impacts to people and the environment in line with current Agency safety standards.[101]

98. A revised Safety Guide *Remediation Process for Areas with Residual Radioactive Material* (DS468) was submitted to Member States for comment in January 2017. Two advisory missions to Fukushima Prefecture were carried out in July and December 2016 to discuss topics related to decontamination and remediation, waste management and monitoring.[102]

F. Transport Safety

99. A draft revision of the *Regulations for the Safe Transport of Radioactive Material: 2012 Edition* (IAEA Safety Standards Series No. SSR-6) was issued to Member States for review and comments in July 2016. A Technical Meeting on the Revision of the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6) and the Associated Advisory Material (SSG-26) was held in Vienna in January–February 2017 to address the comments received from Member States and prepare the final draft; the meeting was attended by over 55 delegates from 24 Member States and 4 international organizations. A final draft was submitted to the Transport Safety Standards Committee for approval in June 2017.[103]

100. The Secretariat analysed the input collected from Member States on relevant international instruments and regulations to finalize the revision of the document GOV/1998/17 entitled *Safety of Transport of Radioactive Material*.[104]

101. Dialogue between Coastal and Shipping States continued under the chairmanship of Portugal after the chair was transferred from Japan in September 2016. Representatives from seven Member States (France, Ireland, Japan, New Zealand, Norway, Portugal and the United Kingdom) visited a Pacific Nuclear Transport Limited ship in the United Kingdom in July 2016.[105]

102. The Agency held the Final Project Review Meeting on the Development of Regulatory Infrastructure and Sustainable Networks for the Safe Transport of Radioactive Material in the Asia and the Pacific region in Thailand in October 2016, and online meetings were held for both the Asian and Pacific Islands Transport Safety Networks in February 2017. The Agency held a workshop on Developing an Effective Compliance Assurance Regime for the Transport of Radioactive Material in Mediterranean Coastal States and Associated Shipping States in Morocco in October 2016, and an online meeting for the Mediterranean Transport Safety Network (MedNet) was held in February 2017. In the Africa region, a Regional Training Course on Inspections to Transport of Radioactive Material

[101] This relates to operative paragraphs 35 and 79 of resolution GC(60)/RES/9.

[102] This relates to operative paragraphs 35 and 81 of resolution GC(60)/RES/9.

[103] This relates to operative paragraphs 35 and 82 of resolution GC(60)/RES/9.

[104] This relates to operative paragraph 82 of resolution GC(60)/RES/9.

[105] This relates to operative paragraphs 83–87 of resolution GC(60)/RES/9.

was conducted in Ethiopia, in November–December 2016. A National Workshop on Transportation of Nuclear Materials was held in Belarus, in September 2016.[106]

G. The Safety of Spent Fuel and Radioactive Waste Management

103. The Agency continued to encourage its Member States to become Contracting Parties to the Joint Convention. This was done through discussions with Member State representatives during Agency conferences, meetings, peer review missions as well as through technical cooperation projects. In the reporting period, Lesotho, Madagascar and the Niger adhered to the Joint Convention. A topical meeting on safety issues and challenges on the disposal of spent fuel and radioactive waste was held in Vienna in September 2016 and was attended by 75 delegates representing 29 Contracting Parties and one international organization. A consultancy meeting entitled First Meeting to Discuss Feedback from Contracting Parties to Improve the Review Process for the Joint Convention was held in Vienna in October 2016 and was attended by representatives from ten Contracting Parties. The Agency organized a dedicated national workshop in the Islamic Republic of Iran in October 2016, and a regional workshop in Thailand in June 2017 for the Asian Nuclear Safety Network (ANSN) countries.[107]

104. In July 2016, the Agency submitted for publication a Safety Guide entitled *Predisposal Management of Radioactive Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education*.[108]

105. The Agency organized the International Conference on the Safety of Radioactive Waste Management in Vienna in November 2016, which was attended by 276 representatives from 63 Member States and 4 international organizations. The conclusions from the conference[109] underlined the importance of national planning for radioactive waste management, operational and long term safety, optimization, communication, regulators' and other interested parties' involvement, as well as post-accident waste management. Within the International Project on Irradiated Graphite Processing Approaches (GRAPA) a consultancy meeting was held in Vienna in November 2016 which produced a revised draft of the project report. The Agency held twelve workshops, two expert missions, and one training course in support of Member States' programmes for safety of spent fuel and radioactive waste management through the technical cooperation programme and the ANSN.[110]

106. The International Project on Demonstration of the Operational and Long-Term Safety of Geological Disposal Facilities for Radioactive Waste (GEOSAF) entered its third phase. A GEOSAF Part III plenary meeting was held in Vienna in May 2017. The International Project on Human Intrusion in the Context of Disposal of Radioactive Waste (HIDRA) continued its work. A consultancy meeting was held in Vienna in June 2017 to study the benefits of establishing an international working group on monitoring programmes for geological disposal. An international peer review of the French Cigéo project for the disposal of radioactive waste in deep geological formations

---

[106] This relates to operative paragraphs 89 and 112 of resolution GC(60)/RES/9.

[107] This relates to operative paragraphs 10, 15, 16 and 20 of resolution GC(60)/RES/9.

[108] This relates to operative paragraphs 35 and 92 of resolution GC(60)/RES/9.

[109] See http://www-pub.iaea.org/iaeameetings/50807/International-Conference-on-the-Safety-of-Radioactive-Waste-Management.

[110] This relates to operative paragraphs 10, 13, 16 and 92 of resolution GC(60)/RES/9.

was held in France in November 2016. In the first half of 2017, the Agency initiated the development of two publications, one provisionally entitled *Roadmap for Developing a Geological Disposal Facility* and the other provisionally entitled *Compendium of Results of Research, Development and Demonstration Activities Carried out at Underground Research Facilities for Geological Disposal*.[111]

107. As part of the cooperation established between the Agency and the Fukushima Prefecture, two meetings were held in July and December 2016 in the Fukushima Prefecture on the management of waste from remediation activities following the nuclear and radiological emergency. Representatives from Fukushima Prefecture also participated in a meeting in Vienna in October 2016 which included a visit to the radioactive waste management facilities in Jaslovské Bohunice and Mochovce in Slovakia. In May 2017, the Agency facilitated the visit of a Japanese delegation to the waste management facilities in Chernobyl, Ukraine. The Agency concluded an extrabudgetary project on the development of clearance levels for the safe disposal of materials on landfill disposal. A consultancy meeting was held in Vienna in April 2017 to analyse the results of the project and to develop a TECDOC provisionally entitled *Management of Large Volumes of Waste Arising in a Nuclear or Radiological Emergency* which includes software for the derivation of clearance levels.[112]

108. The Agency continued to provide support to Member States in the planning and development of safe disposal solutions, in particular with the organization of a training course and 12 workshops through the technical cooperation programme. A consultancy meeting on lessons learned in the management of spent fuel at shutdown reactor sites was held in Vienna in February–March 2017. The experts at this consultancy meeting discussed experience of managing spent fuel at shutdown nuclear power reactor sites. An ANSN regional workshop on the safe management of spent fuel from research and power reactors was held in Japan in February 2017 and a regional workshop on the management of radioactive waste classification was held in Bulgaria in June 2017 under the EuCAS Network.[113]

109. A four-year project on Responsible and Safe Management of Radioactive Waste and Spent Fuel was initiated at the beginning of 2017. The purpose of the project is to assist Member States with the development and application of an internationally agreed safety regime for radioactive waste management, as well as with the development and implementation of national strategies for long term management of radioactive waste.[114]

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

110. The Agency held a workshop on safety infrastructure for uranium production in Vienna in August–September 2016, at which a revised draft Safety Report provisionally entitled *Safety Aspects of Uranium Production* was produced. A consultancy meeting was held in the United States of America in June–July 2016 to further develop the draft Safety Report provisionally entitled *Safety Aspects of Development and Management of Uranium Production by In Situ Leaching*. A Technical

[111] This relates to operative paragraph 94 of resolution GC(60)/RES/9.

[112] This relates to operative paragraphs 35, 97 and 107 of resolution GC(60)/RES/9.

[113] This relates to operative paragraphs 10, 16 and 98 of resolution GC(60)/RES/9.

[114] This relates to operative paragraphs 10, 35, 92 and 99 of resolution GC(60)/RES/9.

Meeting on the Safety of Uranium Production Using the In Situ Leaching Method was held in Vienna in October 2016, and was attended by representatives from ten Member States.[115]

111. The Agency is preparing a project report entitled *Management of Project Risks in Decommissioning* based on the results of the International Project on Use of Safety Assessment in Planning and Implementation of Decommissioning of Facilities using Radioactive Material (FaSa) and the International Project on Decommissioning Risk Management (DRiMa). A national workshop on safety assessment was held in Lithuania in December 2016 and a regional workshop on management of project risks in decommissioning was held in Ukraine in February–March 2017.[116]

112. The Agency held a consultancy meeting in Vienna in July 2016 to finalize the Proceedings of the International Conference on Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes, which had been held in Spain in May 2016.[117]

113. The Agency supported Member States' decommissioning programmes by providing guidance and training material on safe decommissioning. The draft Safety Guide entitled *Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities* (DS452) was submitted to the CSS. Comments from Member States on the draft Safety Guide entitled *Decommissioning of Medical, Industrial and Research Facilities* (DS403) were taken into account and a revised draft was reviewed by the Safety Standards Committees in June 2017. A TECDOC entitled *Model Regulations for the Decommissioning of Facilities* was submitted for publication in June 2017. An interregional workshop on model regulations for decommissioning was held in Vienna in January 2017. The Agency continued the revision of training materials on decommissioning safety, and developed new training modules on characterization, decommissioning planning, safety assessment, and the release of sites. Three consultancy meetings to support this work were held in October and November 2016, and in March 2017.[118]

114. The Agency held a workshop on management of waste generated by research reactor decommissioning in Vienna in October 2016. This workshop concluded a project aimed at supporting Member States in Africa to prepare for decommissioning of research reactors.[119]

115. The Agency held a plenary meeting for the International Project on Managing the Decommissioning and Remediation of Damaged Nuclear Facilities (DAROD Project) in Vienna in August–September 2016. The meeting focused on the elaboration of case studies for damaged nuclear facilities based on the topical areas of the DAROD Project working groups. A consultancy meeting for the DAROD Project was held in Vienna in February 2017. A summary report of the project was produced as well as a plan for organizing an international workshop on managing the decommissioning and remediation of damaged and legacy nuclear facilities to disseminate the results of the DAROD Project.[120]

116. The Agency developed two TECDOCs on remediation: one provisionally entitled *Practical Techniques for Reducing Doses Received by Members of the Public at Legacy Sites Associated with the Mining and Processing of Uranium Ore* and another provisionally entitled *Regulatory Review of*

---

[115] This relates to operative paragraph 100 of resolution GC(60)/RES/9.

[116] This relates to operative paragraphs 16 and 101 of resolution GC(60)/RES/9.

[117] This relates to operative paragraphs 13 and 102 of resolution GC(60)/RES/9.

[118] This relates to operative paragraphs 13, 35, 104 and 112 of resolution GC(60)/RES/9.

[119] This relates to operative paragraph 104 of resolution GC(60)/RES/9.

[120] This relates to operative paragraphs 104 and 105 of resolution GC(60)/RES/9.

Remediation Plans for Legacy Sites Associated with the Mining and Processing of Uranium Ore. These two TECDOCs were submitted for publication in April 2017.[121]

117. An expert mission to review feasibility studies and environmental impact assessments for remediation of legacy sites was held in Kyrgyzstan, in September 2016, under the Coordination Group for Uranium Legacy Sites (CGULS). Two expert missions on estimating the costs of remediation were conducted in Vienna in February 2017 for sites in Kyrgyzstan and in Tajikistan, in March 2017 for sites in Tajikistan. The Agency, in close collaboration with the European Commission, the European Bank for Reconstruction and Development, the State Atomic Energy Corporation "Rosatom" and the Member States in Central Asia, is finalizing the development of a Strategic Master Plan for the remediation of uranium legacy sites in Central Asia. The Secretariat continues to respond to Member State requests for specific assistance through CGULS. A series of training programmes focused on the remediation of legacy sites is being translated into Russian for future implementation in Central Asia.[122]

118. The Agency continued to implement activities through the International Working Forum on Regulatory Supervision of Legacy Sites (RSLS). The Agency is drafting a TECDOC on the results of the RSLS's work from 2011 to 2015. The Agency held the annual Technical Meeting of the RSLS in Vienna in November 2016 which focused on management, regulatory oversight practices and training of inspectors of legacy sites. The second phase of the RSLS was launched with updated terms of reference and a work programme for 2017–2019.[123]

119. The Agency held a Plenary Meeting of the Network on Environmental Management and Remediation (ENVIRONET) in Vienna in November–December 2016, which was attended by 29 participants from 25 Member States.[124]

I. The Safe Management of Radioactive Sources

120. The Agency conducted advisory missions on the regulatory infrastructure for radiation safety and the control of radiation sources in Bahrain in March 2017, El Salvador in June 2017, Honduras in February 2017, Liberia in May 2017, Morocco in August–September 2016, Papua New Guinea in January 2017, and Paraguay in June 2017. The national radiation safety infrastructures of six Member States were reviewed during imPACT missions ('integrated missions of the Programme of Action for Cancer Therapy') to Belize in December 2016, Burundi in March 2017, the Congo in June 2017, Kazakhstan in November 2016, Paraguay in September 2016, and Sierra Leone in November 2016.[125]

121. The Agency held 20 national and 8 regional training courses for staff of radiation safety regulatory bodies under the technical cooperation programme. Regional training courses were held on national inspection programmes for the Latin America region in Chile in December 2016; on regulatory control in radiosurgery practices in Brazil in June 2017; on organization and

---

[121] This relates to operative paragraphs 35 and 106 of resolution GC(60)/RES/9.

[122] This relates to operative paragraphs 108 and 112 of resolution GC(60)/RES/9.

[123] This relates to operative paragraphs 13 and 109 of resolution GC(60)/RES/9.

[124] This relates to operative paragraphs 10, 13 and 110 of resolution GC(60)/RES/9 and operative paragraphs 26 and 27 of resolution GC(60)/RES/12.

[125] This relates to operative paragraphs 16, 25 and 115 of resolution GC(60)/RES/9.

implementation of a national regulatory programme for the control of radiation sources in the Republic of Korea in September 2016; on authorization and inspection of radiation sources in French in Cameroon in April 2017; on registers of radiation sources for the Caribbean countries in Trinidad and Tobago in January 2016; on orphan source search in the Philippines in October 2016; on the establishment of integrated management systems for regulatory bodies for Africa in Mauritius in July 2016 and for the ARASIA countries in Vienna in October 2016; on organization, staffing and competence management of regulatory bodies for ARASIA countries in Lebanon in February 2017; on regulatory enforcement for the Africa region in Zimbabwe in April 2017; on effective and sustainable regulatory control for ARASIA countries in Jordan in May 2017; and, in cooperation with the Korea Institute of Nuclear Safety (KINS), on the safety of radiation sources for the Forum of Nuclear Regulatory Bodies in Africa (FNRBA) countries in Kenya in November 2016. The Agency held three Schools for Drafting Regulations on Radiation Safety in Vienna for the Europe region in August 2016, for the Africa region in December 2016 and for the Caribbean region in January 2017.[126]

122. A number of operations were conducted in 2016 to remove disused sealed radioactive sources (DSRSs) from user premises and to place them under safe and secure storage conditions. Four Category 1 DSRSs were removed from three Member States: one disused teletherapy source from Lebanon, two disused teletherapy sources from Cameroon, and one disused irradiator source from Tunisia. One Category 1 DSRS was removed from a teletherapy device in Uganda and transferred into safe and secure storage — this enabled the refurbishment of the bunker and the installation of a new teletherapy device so that cancer therapy in Uganda could resume. The Agency initiated further projects for the removal of Category 1 and 2 DSRSs in Albania, Burkina Faso, Lebanon and the former Yugoslav Republic of Macedonia.[127]

123. The Agency continued to support Member States in establishing or upgrading their national source registers through the Regulatory Authority Information System (RAIS). National expert missions on the use and customization of RAIS took place in Brunei Darussalam in July 2016, Palau in February 2017, and Qatar in December 2016. An upgraded version of RAIS is being developed based on feedback from users. A regional workshop on the establishment of a registry of radiation sources using RAIS was held for the Caribbean countries in Trinidad and Tobago in January 2017. An International Workshop on National Registers of Radiation Sources took place in Vienna in March 2017, attended by 60 representatives from 50 Member States.[128]

124. As of 30 June 2017, 134 States, including Antigua and Barbuda, Belize and El Salvador in the reporting period, have made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 107, including 3 States in the reporting period, have also notified the Director General of their intention to act in a harmonized manner in accordance with the Code's supplementary Guidance on the Import and Export of Radioactive Sources. A total of 140 States have nominated points of contact to facilitate the export and import of radioactive sources.[129]

125. In March 2017, the Director General submitted a report to the Board of Governors entitled *Code of Conduct on the Safety and Security of Radioactive Sources: Guidance on the Management of Disused Radioactive Sources* (GOV/2017/4). This report contained draft Guidance on the

---

[126] This relates to operative paragraphs 10, 16, 17, 25, 26, 113 and 115 of resolution GC(60)/RES/9.

[127] This relates to operative paragraphs 116 and 117 of resolution GC(60)/RES/9 and operative paragraph 29 of resolution GC(60)/RES/10.

[128] This relates to operative paragraphs 16, 25 and 118 of resolution GC(60)/RES/9.

[129] This relates to operative paragraphs 23 and 119 of resolution GC(60)/RES/9.

Management of Disused Radioactive Sources and the report of the Chairman of the 2016 Open-ended Meeting of Legal and Technical Experts to Develop Internationally Harmonized Guidance for Implementing the Recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources in Relation to the Management of Disused Radioactive Sources.[130]

126. An Open-ended Meeting of Legal and Technical Experts on the Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources was held in Vienna in June 2017 to exchange information and experience on the financial provisions established by Member States to manage disused radioactive sources. The meeting was attended by 180 representatives from 101 Member States.[131]

127. An Interregional Workshop on the Code of Conduct and Guidance Implementation to Ensure Control of the Radioactive Sources during International Transfers was held in Malta in November 2016.[132]

J. Education, Training and Knowledge Management in Nuclear, Radiation, Transport and Waste Safety

128. The Agency's Steering Committee on Education and Training in Radiation, Transport and Waste Safety met in Vienna in December 2016 to advise the Secretariat on the implementation of the Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020[133]. The Steering Committee issued recommendations to further support Member States in establishing a national strategy for education and training in radiation, transport and waste safety.[134]

129. The Steering Committee on Regulatory Capacity Building and Knowledge Management held its eighth annual meeting in Vienna in December 2016, attended by representatives from 26 Member States. The Steering 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 (SARCoN), and training on safety leadership and safety culture.[135]

130. The Postgraduate Educational Course (PGEC) in Radiation Protection and the Safety of Radiation Sources, which has a nominal duration of six months, was conducted on a regional basis in Algeria, Argentina, Belarus, Ghana and Malaysia. Train-the-trainers courses for radiation protection officers took place in Kyrgyzstan in July 2016, Sri Lanka in October 2016, Greece in May 2017 and Ghana in June 2017.[136]

---

[130] This relates to operative paragraph 121 of resolution GC(60)/RES/9.

[131] This relates to operative paragraphs 120 and 122 of resolution GC(60)/RES/9.

[132] This relates to operative paragraphs 120 and 122 of resolution GC(60)/RES/9.

[133] Note by the Secretariat 2010/44: https://www-ns.iaea.org/downloads/rw/training/strategic-approach2011-2020.pdf.

[134] This relates to operative paragraph 112 of resolution GC(60)/RES/9.

[135] This relates to operative paragraphs 10 and 112 of resolution GC(60)/RES/9.

[136] This relates to operative paragraphs 16 and 112 of resolution GC(60)/RES/9.

131. Representatives of the Agency's regional training centres for radiation protection in Algeria, Argentina, Belarus, Brazil, Ghana, Greece, Malaysia, Morocco and the Syrian Arab Republic met in Vienna in August 2016 to support the PGEC assessment process. An initial impact evaluation report of the PGEC, including impact that the course has had on participants' professional development (at the individual level), and utilization of knowledge and skills towards strengthening radiation safety infrastructures (at the organizational and/or national level) was finalized in November 2016. The impact evaluation was based on data collected from self-assessments and was conducted for the four technical cooperation regions over 78 courses. The Agency started to evaluate the impact of the train-the-trainers courses for radiation protection officers by collecting feedback from the participants.[137]

132. A training course was held in Algeria in September 2016 based on the Training Course Series publication entitled *Regulatory Control of Nuclear Power Plants* (Training Course Series No. 15). The full course materials and train-the-trainers package for the Basic Professional Training Course on Nuclear Safety (BPTC) were presented at two national workshops in the Sudan in a two-week format in November–December 2016 and January–February 2017. The Agency held a BPTC in Kenya in November–December 2016.[138]

133. Regional workshops were held in Cyprus in October 2016 and in the Philippines in March 2017 to advise national stakeholders on how to establish a national strategy for education and training. Expert missions to provide advice on the same topic were hosted by the Democratic Republic of the Congo in January 2017 and by Honduras in April 2017. In December 2016, the Agency conducted, through the technical cooperation programme, an expert mission in Djibouti to assist national capacity building for safety.[139]

134. Member States continued to revise and update their national information in Thematic Safety Area 6 (TSA 6) — Education and Training in Radiological Protection and Safety — of RASIMS[140]. The TSA 6 profiles of 60 Member States were updated.[141]

135. Three Schools of Radiation Emergency Management were conducted in Japan in August 2016 for the Asia and the Pacific region, in Austria in October 2016 for the Europe region, and in Mexico in May 2017 for the Latin America and the Caribbean region.[142]

136. Two hands-on inspector training courses on regulatory inspection and enforcement were held at the Zwentendorf NPP, Austria, in September 2016 and May 2017. The Agency continued the development of a TECDOC to provide inspectors with guidance and methods for gathering information to support specific technical and observation skills for the inspection of NPPs. Further specific training on the regulatory aspects of nuclear installations, including the School for Drafting Regulations on Nuclear Safety and workshops based on the Agency's safety standards, was also conducted in Vienna in November 2016.[143]

---

[137] This relates to operative paragraphs 16 and 114 of resolution GC(60)/RES/9.

[138] This relates to operative paragraphs 3, 16 and 112 of resolution GC(60)/RES/9.

[139] This relates to operative paragraphs 10, 16 and 112 of resolution GC(60)/RES/9.

[140] See http://rasims.iaea.org.

[141] This relates to operative paragraphs 9, 111 and 112 of resolution GC(60)/RES/9.

[142] This relates to operative paragraphs 112 and 114 of resolution GC(60)/RES/9.

[143] This relates to operative paragraphs 3, 16, 26, 112 and 114 of resolution GC(60)/RES/9.

137. The Agency continued to provide support for safety assessment capacity building to countries embarking on nuclear power programmes. The Agency held a workshop on the practical application of thermal hydraulic codes in Malaysia in September 2016 and an essential knowledge workshop on neutron kinetics in Jordan in July 2016. A national workshop on severe accident phenomena and analysis was conducted in Egypt in March 2017.[144]

138. The Agency supported regulatory capacity building in Member States by holding a regional workshop on the SARCoN in Poland in November 2016. The Agency continued to analyse Member States' experiences with the use of the SARCoN methodology and analysed the results of a survey intended to improve the usability and operational capacities of the SARCoN guidelines and software.[145]

139. The Agency published training material on the safety of research reactors on a CD-ROM and on its publications website[146]. A national training course on the safety of research reactors, including deterministic and complementary probabilistic safety assessment for research reactors, was held in Colombia in April 2017.[147]

140. A national training course on Radiation Protection and Safety in the Medical Uses of Ionizing Radiation — Implementing the International Basic Safety Standards was held in China in May 2017. The training course was attended by 200 representatives.[148]

141. A revision of the training manual for transport safety was completed in May 2017 to provide working material for an e-learning platform and to support other transport safety training initiatives in the Agency.[149]

142. The Agency held two consultancy meetings in Vienna in November 2016 and in April 2017 to develop the taxonomy for a Global Education and Training Resource (GETR) platform[150]. GETR intends to collect information on training and education resources offered by the Agency and Member States in nuclear and radiation safety. Over 200 training resources have been shared through GETR.[151]

143. Within the GNSSN, the Agency held two consultancy meetings in Vienna in November 2016 and in February 2017 to develop a draft TECDOC provisionally entitled *Managing Nuclear Safety Knowledge: National Approaches and Experience*.[152]

144. The Agency held two consultancy meetings in Vienna in November 2016 and in June 2017 to develop national nuclear safety knowledge platforms. During the reporting period five new national

---

[144] This relates to operative paragraphs 3 and 112 of resolution GC(60)/RES/9.

[145] This relates to operative paragraph 112 of resolution GC(60)/RES/9.

[146] See http://www-pub.iaea.org/books/IAEABooks/11156/Safety-of-Research-Reactors-Training-Material.

[147] This relates to operative paragraphs 10, 112 and 113 of resolution GC(60)/RES/9.

[148] This relates to operative paragraphs 63 and 112 of resolution GC(60)/RES/9.

[149] This relates to operative paragraphs 91 and 112 of resolution GC(60)/RES/9.

[150] https://gnssn.iaea.org/main/getr/Pages/default.aspx

[151] This relates to operative paragraphs 112 and 113 of resolution GC(60)/RES/9.

[152] This relates to operative paragraphs 112 and 113 of resolution GC(60)/RES/9.

web-based platforms were developed. Currently 25 national platforms[153] are accessible through the GNSSN website.[154]

145. The Agency held two consultancy meetings to further develop its capacity building methodology for Member States self-assessment and the associated questionnaires in Vienna in January 2017 and June 2017. Based on the results a TECDOC on national experiences and approaches to capacity building was developed and sent to partner organizations in Member States for comment.[155]

146. The Agency conducted 51 capacity building activities under the GNSSN extrabudgetary programme: 7 generic GNSSN activities, 26 under the ANSN, 5 under the FNRBA, 4 under the Arab Network of Nuclear Regulators (ANNuR), 2 under the EuCAS Network, 6 under the TSO Forum and 1 under the Global Nuclear Safety and Security Communications Network (GNSSCOM). The activities involved over 770 participants.[156]

147. The Agency conducted an assessment of needs in nuclear and radiation safety and security in August 2016 in Vienna as part of the FNRBA's Steering Committee meeting. The results of five surveys on regulatory infrastructure and emergency preparedness and response were published as technical reports on the FNRBA website[157].[158]

148. The Agency organized an ANNuR plenary meeting during the 60th regular session of the Agency's General Conference. The Agency continued to support the implementation of the ANNuR project for research reactors and organized the eighth annual ANNuR meeting in Tunisia in March 2017 which focused on the capacity building methodology and the development of national capacity building programmes.[159]

149. The TSO Forum finalized the TECDOC entitled *Technical and Scientific Support Organizations (TSOs) and their Services Provided in Support to Regulatory Functions* in Vienna in August 2016, which was subsequently submitted for publication. The TSO Forum initiated an action plan to support the technical and scientific capability for regulatory functions in countries embarking on a nuclear power programme and those in the process of developing their TSOs during a consultancy meeting in Vienna in July 2016. A consultancy meeting took place in April 2017 to develop the programme of the TSO Conference 2018 that will take place in Belgium.[160]

150. The Agency held a consultancy meeting in Vienna in April 2017 to develop safety and security related content for the Agency's communication toolbox as well as a website for the GNSSCOM. The Agency organized the first GNSSCOM Steering Committee meeting in Vienna in May 2017 to review the proposed content of the website and to advise on the preparation of a Technical Meeting on challenges and good practices for safety and security communication.[161]

---

[153] https://gnssn.iaea.org/sites/auth/RegNet/CCA/SitePages/Home.aspx

[154] This relates to operative paragraphs 10, 17 and 113 of resolution GC(60)/RES/9.

[155] This relates to operative paragraphs 10, 112, 113 of resolution GC(60)/RES/9.

[156] This relates to operative paragraphs 10, 112 and 113 of resolution GC(60)/RES/9.

[157] See https://gnssn.iaea.org/main/FNRBA/Pages/default.aspx.

[158] This relates to operative paragraph 113 of resolution GC(60)/RES/9.

[159] This relates to operative paragraphs 10, 17 and 113 of resolution GC(60)/RES/9.

[160] This relates to operative paragraphs 3, 10, 13, 17 and 113 of resolution GC(60)/RES/9.

[161] This relates to operative paragraphs 10, 13, 14, 17 and 113 of resolution GC(60)/RES/9.

151. The Agency continued to develop the GNSSN by adding two new web-based platforms for ARTEMIS and for GNSSCOM. Three web-based platforms (ANNuR, FNRBA and TSO Forum) were also enhanced. A new document management system was developed to facilitate the accessibility and visibility of the nuclear safety documents uploaded on the GNSSN.[162]

K. Nuclear and Radiological Incident and Emergency Preparedness and Response

152. The Agency continued to encourage Member States' adherence to the Early Notification Convention and the Assistance Convention by, inter alia, addressing a note verbale to those Member States that had not yet done so. In the reporting period, two Member States, Ghana and Madagascar, adhered to the Early Notification Convention and three Member States, Ghana, Madagascar and the Niger, adhered to the Assistance Convention. [163]

153. The Agency held four workshops in Vienna in July 2016, May 2017 and June 2017 and in Romania in September 2016 on notification, reporting and requesting assistance through the implementation of the *Operations Manual for Incident and Emergency Communication* (Emergency Preparedness and Response Series, EPR-IEComm 2012).[164]

154. The Agency's Unified System for Information Exchange in Incidents and Emergencies (USIE), which is a secured website, was further improved based on users' feedback. A new functionality permits an automatic exchange of information between the relevant websites of the Agency and the European Commission. A project was initiated to store messages and attached documents in an encrypted format on the USIE website in order to provide a secure storage of information.[165]

155. The Agency conducted 14 Convention Exercises (ConvEx) of various levels of complexity including a ConvEx-3 exercise in June 2017, hosted by Hungary, with the participation of 82 Member States and 11 international organizations. This exercise lasted 36 hours and tested emergency arrangements at national and international level including arrangements described in EPR-IEComm 2012, the *Joint Radiation Emergency Management Plan of the International Organizations* (Emergency Preparedness and Response Series, EPR-JPLAN 2017) and *IAEA Response and Assistance Network* (Emergency Preparedness and Response Series, EPR-RANET 2013). In addition, the Agency conducted three exercises with the World Meteorological Organization in August 2016, November 2016 and February 2017 to test the provisions for atmospheric transport and dispersion modelling results.[166]

156. The Agency facilitated the conduct of a tabletop exercise of the Dialogue between Coastal and Shipping States on 28 June 2017.[167]

---

[162] This relates to operative paragraph 17 of resolution GC(60)/RES/9.

[163] This relates to operative paragraphs 21 of resolution GC(60)/RES/9.

[164] This relates to operative paragraphs 16, 128 and 129 of resolution GC(60)/RES/9.

[165] This relates to operative paragraph 129 of resolution GC(60)/RES/9.

[166] This relates to operative paragraphs 129 and 131 of resolution GC(60)/RES/9.

[167] This relates to operative paragraph 85 of resolution GC(60)/RES/9.

157. The Agency held four regional workshops in Vienna in October 2016 and June 2017, in Canada in June 2017 and in Japan in November 2016, and three national workshops in Vienna in November 2016, in the United Arab Emirates in April 2017 and in China in June 2017 on the implementation of the General Safety Requirements publication *Preparedness and Response for a Nuclear or Radiological Emergency* (IAEA Safety Standards Series No. GSR Part 7).[168]

158. A Technical Meeting was held in Vienna in September 2016 for the preparation of a draft Safety Guide entitled *Arrangements for Public Communication in Preparedness and Response for a Nuclear or Radiological Emergency* (DS475). This draft Safety Guide was submitted to the Safety Standards Committees for comment in April 2017. In March 2017, the draft Safety Guide *Arrangements for the Termination of a Nuclear or Radiological Emergency* (DS474) was submitted for its second review by the Safety Standards Committees. Three consultancy meetings were held in Vienna in November 2016, and in February and June 2017 to revise the Safety Guide *Preparedness and Response for an Emergency during the Transport of Radioactive Material* (DS469).[169]

159. The Agency held a Technical Meeting to review the assessment and prognosis procedures for nuclear and radiological emergencies in Vienna in November 2016, which was attended by 77 representatives from 53 Member States and 3 international organizations. Over 40 participants joined discussions via an online web stream. Participants discussed the Agency's draft *Operations Manual for IAEA Assessment and Prognosis*, including relevant technical information and roles of the parties involved in the process. The Agency's assessment tool website was officially launched in April 2017 and made accessible to all emergency contact points.[170]

160. In line with the recommendations from the 2015 International Conference on Global Emergency Preparedness and Response, the Agency is developing a briefing package to assist communication with the public during nuclear or radiological emergencies. In addition, the Agency held a Technical Meeting in Vienna in February 2017 to discuss off-site emergency preparedness and response (EPR) arrangements for next generation reactors including fast breeder reactors, small and medium sized or modular reactors and high temperature gas cooled reactors. The meeting was attended by 57 representatives from 36 Member States and included safety assessment and technology experts. The need for further technical guidance on hazard assessment methodologies to support EPR arrangements was highlighted in the conclusions of the meeting.[171]

161. The Agency published *Guidelines on the Harmonization of Response and Assistance Capabilities for a Nuclear or Radiological Emergency* (Emergency Preparedness and Response Series, EPR-Harmonized Assistance Capabilities (2017)) in January 2017. This publication supports the Response and Assistance Network (RANET). The Agency also held a consultancy meeting in Vienna in January 2017 on the extension of the National Assistance Capabilities, as defined in EPR-RANET 2013, to further address potential needs in provision of requested international assistance in a nuclear and radiological emergency.[172]

---

[168] This relates to operative paragraphs 16, 35 and 75 of resolution GC(60)/RES/9.

[169] This relates to operative paragraphs 35, 130 and 136 of resolution GC(60)/RES/9.

[170] This relates to operative paragraph 125 of resolution GC(60)/RES/9.

[171] This relates to operative paragraphs 3, 130 and 136 of resolution GC(60)/RES/9.

[172] This relates to operative paragraph 128 of resolution GC(60)/RES/9.

162. Twenty three new national coordinators for the Emergency Preparedness and Response Information Management System (EPRIMS) were designated by Member States.[173]

163. The Agency issued the seventh edition of the EPR-JPLAN 2017 in February 2017 which is co-sponsored by 18 international organizations. The seventh edition introduces a new ConvEx level exercise (ConvEx-2f). This exercise is intended to test the overall response procedures of the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE) as well as IACRNE organizations' provisions for public communications during a nuclear or radiological emergency. The Agency held a meeting, which included a tabletop exercise, for public information officers of the IACRNE organizations in Vienna in December 2016.[174]

164. The Secretariat further enhanced the usability of the International Radiation Monitoring Information System (IRMIS), which is a secured website for reporting and visualization of large volumes of radiation monitoring data during a nuclear or radiological emergency. The Agency concluded Practical Arrangements with Canada and Indonesia in July and December 2016 respectively and both Member States have started providing data in IRIMIS.[175]

165. In October 2016, the Agency made available on its website[176] the report of the Eighth Meeting of Representatives of Competent Authorities identified in accordance with the Early Notification Convention and the Assistance Convention that took place in Vienna in June 2016.[177]

L. Civil Liability for Nuclear Damage

166. The Secretariat continued to assist Member States, upon request, in their efforts to adhere to nuclear liability instruments. In the reporting period, Canada adhered to the Convention on Supplementary Compensation for Nuclear Damage.[178]

167. The International Expert Group on Nuclear Liability (INLEX) held its 17th regular meeting in Vienna in May 2017. Following a report by individual members on developments in the field of civil liability for nuclear damage since the previous meeting, the Group considered the possible exclusion of certain low risk installations from the scope of application of the liability conventions with specific reference to the case of installations being decommissioned and of installations for the disposal of certain types of low level radioactive waste. In this respect, the Group concluded that there is no need to exclude any such installations from the scope of application of the revised Vienna Convention on Civil Liability for Nuclear Damage and of the Convention on Supplementary Compensation for Nuclear Damage. The Group also discussed other liability issues relating to disposal facilities, to transportable nuclear power plants and to the transport of nuclear material, as well as the scope of application of the nuclear liability conventions as regards radioactive products or waste. However, the

---

[173] This relates to operative paragraphs 125, 126 and 134 of resolution GC(60)/RES/9.

[174] This relates to operative paragraphs 130 and 131 of resolution GC(60)/RES/9.

[175] This relates to operative paragraph 133 of resolution GC(60)/RES/9.

[176] See http://www-pub.iaea.org/MTCD/Meetings/PDFplus/2016/51831/51831Report.pdf.

[177] This relates to operative paragraph 137 of resolution GC(60)/RES/9.

[178] This relates to operative paragraph 30 of GC(60)/RES/9.

Group felt that these issues required a more detailed analysis, and decided to consider them further at its next meeting.[179]

168. One IAEA/INLEX follow-up mission was conducted in Malaysia in February 2017. The sixth Workshop on Civil Liability for Nuclear Damage was held in Vienna in May 2017. This workshop, attended by diplomats and experts from 35 Member States, provided an introduction to the international legal regime of civil liability for nuclear damage. In addition, a Sub-regional Workshop on Civil Liability for Nuclear Damage for Latin American States, hosted by the Government of Uruguay, took place in Montevideo from 7 to 9 June 2017, and was attended by participants from 11 IAEA Member States. A revision of *The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage — Explanatory Texts* was published in 2017 as IAEA International Law Series No. 3 (Revised).[180]

[179] This relates to operative paragraph 31 of resolution GC(60)/RES/9.

[180] This relates to operative paragraphs 30 and 31 of resolution GC(60)/RES/9.