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

Report by the Director General

Summary

Pursuant to resolution GC(56)/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
- Nuclear installation safety
- Radiation safety
- Transport safety
- The safety of spent fuel and radioactive waste management
- The safe decommissioning of nuclear facilities and other facilities using radioactive material
- Safety in uranium mining and processing and remediation of contaminated sites
- Education and training and knowledge management in nuclear, radiation, transport and waste safety
- The safety and security of radioactive sources
- Nuclear and radiological incident and emergency preparedness and response
- 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 fifty-seventh session (2013) of the General Conference in response to resolution GC(56)/RES/9, in which the General Conference requested the Director General to report in detail on implementation of the resolution, including other relevant developments in the intervening period. This report covers the period 1 July 2012 to 30 June 2013.

2. In line with the above resolution of the 56th Session of the General Conference, the Agency continued to strengthen its efforts to maintain and improve nuclear, radiation, transport and waste safety, focusing, inter alia, on the technical areas and geographical regions where the need for such efforts is greatest. The Agency also assisted in maintaining and enhancing legal and regulatory effectiveness and encouraged the activities of regional safety forums and related networks.[1]

3. The implementation of the IAEA Action Plan on Nuclear Safety (the Action Plan) is one of the Agency's priority areas. The Action Plan activities cover many areas of nuclear safety such as the assessments of safety vulnerabilities of nuclear power plants, strengthening Agency peer review services, emergency preparedness and response, capacity building and developing self-assessment tools for regulators.[2] The Director General has reported to the Board of Governors the progress in the implementation of the Action Plan.[3]

4. The Government of Japan, in co-sponsorship with the Agency, organized the Fukushima Ministerial Conference on Nuclear Safety in Fukushima Prefecture, Japan, in December 2012. The principal objective of the Conference was to contribute to strengthening nuclear safety worldwide by providing yet another opportunity to share with the international community, at the ministerial and expert levels, further knowledge and lessons learned from the Fukushima accident and to further enhance transparency, including the implementation of the Action Plan. The Conference was attended by over 700 delegates from 117 countries and 13 international organizations. Forty-six of these delegates attended at the level of minister or equivalent high rank, or as a head of organization. The

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[1] This relates to operative paragraphs 1 and 2 of resolution GC(56)/RES/9.

[2] This relates to operative paragraphs 20, 21, 22 and 23 of resolution GC(56)/RES/9.

[3] Progress in the implementation of the IAEA Action Plan on Nuclear Safety: GOV/INF/2012/11-GC(56)INF/5; GOV/INF/2012/16; GOV/INF/2013/1; GOV/INF/2013/7.

Director General reported the outcome of the Conference to the 2013 March meeting of the Board of Governors.[4,5]

5. The Secretariat made available the reports of the three international experts' meetings (IEMs) held in 2012 at the IAEA Action Plan on Nuclear Safety web site[6] to the delegations and participants at the Fukushima Ministerial Conference on Nuclear Safety: *IAEA Report on Reactor and Spent Fuel Safety in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant* (International Experts' Meeting on Human and Organizational Factors in Nuclear Safety in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant Vienna, Austria, 19–22 March 2012), *IAEA Report on Enhancing Transparency and Communication Effectiveness in the Event of a Nuclear or Radiological Emergency* (International Experts' Meeting on Enhancing Transparency and Communication Effectiveness in the Event of a Nuclear or Radiological Emergency, Vienna, Austria, 18–20 June 2012) and *IAEA Report on Protection Against Extreme Earthquakes and Tsunamis in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant* (International Experts' Meeting on Protection Against Extreme Earthquakes and Tsunamis in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant, Vienna, Austria, 4–7 September 2012).[7]

6. Work is underway on a comprehensive report on the Fukushima Daiichi accident, to be finalized in 2014. The goal is to produce an authoritative, factual and balanced assessment, addressing the causes and consequences of the accident, as well as lessons learned. The report will, inter alia, cover the description and context of the accident, safety assessment, emergency preparedness and response, radiological consequences as well as post-accident recovery. The report will be a major undertaking of the Agency in terms of reporting an assessment on the Fukushima Daiichi accident.[8]

7. Five working groups have been established, each composed of some 15–20 internationally recognized experts, to assist in the preparation of the report. These experts come from around 40 Member States and several international organizations, ensuring a broad representation of experience and knowledge. More than 120 experts attended the first working group meetings in Vienna, Austria in March 2013 to discuss the working methods and an initial proposal for a table of contents for the report. Each working group is co-chaired by an external expert and one or more Secretariat experts.[9]

8. An International Technical Advisory Group (ITAG) was also established in March 2013, comprising experts from the International Nuclear Safety Group (INSAG), the International Commission on Radiological Protection (ICRP) and other relevant international entities. The role of ITAG is to provide assistance and advice to ensure that the Agency's comprehensive report on the Fukushima Daiichi accident has a high scientific and technical level. Furthermore, the Secretariat established a core group that comprises staff from the Secretariat's senior management for the close coordination and final approval of the report.[10]

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[4] GOV/INF/2013/2 dated 6 February 2013.

[5] This relates to operative paragraph 21 of resolution GC(56)/RES/9.

[6] See http://www.iaea.org/newscenter/focus/actionplan/index.html.

[7] This relates to operative paragraph 22 of resolution GC(56)/RES/9.

[8] This relates to operative paragraph 22 of resolution GC(56)/RES/9.

[9] This relates to operative paragraph 22 of resolution GC(56)/RES/9.

[10] This relates to operative paragraph 22 of resolution GC(56)/RES/9.

B. The Agency's Safety Standards Programme

9. In the reporting period, seven Agency safety standards were issued: *Regulations for the Safe Transport of Radioactive Material, 2012 Edition* (IAEA Safety Standards Series No. SSR-6), *Safety Assessment for Research Reactors and Preparation of the Safety Analysis Report* (IAEA Safety Standards Series No. SSG-20), *Volcanic Hazards in Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSG-21), *Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors* (IAEA Safety Standards Series No. SSG-22), *The Safety Case and Safety Assessment for the Disposal of Radioactive Waste* (IAEA Safety Standards Series No. SSG-23), *Safety in the Utilization and Modification of Research Reactors* (IAEA Safety Standards Series No. SSG-24) and *Use of External Experts by the Regulatory Body* (IAEA Safety Standards Series No. GSG-4).[11]

10. The Commission on Safety Standards (CSS) endorsed for submission to the Board of Governors the draft addendum to the Safety Requirements *Safety of Nuclear Fuel Cycle Facilities* (IAEA Safety Standards Series No. NS-R-5) with two new appendices covering reprocessing facilities and fuel cycle research and development facilities. In June 2013, the Board of Governors approved the Safety Requirements publication incorporating the draft addendum.[12]

11. For the review of the Agency's safety standards in the light of the Fukushima Daiichi accident, the findings and conclusions of the various studies carried out following the accident were analysed. The Agency's Safety Requirements were then examined in a systematic manner on the basis of this analysis in order to identify whether modifications were desirable. The review revealed no significant areas of weakness in the Agency's Safety Requirements; a small set of amendments were proposed to strengthen the requirements and to facilitate their implementation.[13]

12. The CSS agreed in October 2012 that a document outline be prepared by the Secretariat to initiate the revision process of *Governmental, Legal and Regulatory Framework for Safety* (IAEA Safety Standards Series No. GSR Part 1), *Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. NS-R-3), *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1), *Safety of Nuclear Power Plants: Commissioning and Operation* (IAEA Safety Standards Series No. SSR-2/2) and *Safety Assessment for Facilities and Activities* (IAEA Safety Standards Series No. GSR Part 4), in conjunction with the already agreed revision of *Preparedness and Response for a Nuclear or Radiological Emergency* (IAEA Safety Standards Series No. GS-R-2) and *The Management System for Facilities and Activities* (IAEA Safety Standards Series No. GS-R-3).[14]

13. The proposed revisions result from the review of the lessons learned, including of those contained in the two reports from the Government of Japan, issued in June and September 2011, the report of the IAEA Fact Finding Mission conducted from 24 May to 2 June 2011 and the letter from INSAG dated 26 July 2011. Additional inputs considered were the findings of the IEMs, the presentations made at the Second Extraordinary Meeting of the Contracting Parties to the Convention on Nuclear Safety (August 2012), and the results of the analysis of several national and regional reports. In accordance with the safety standards review and approval process, the draft revisions were

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[11] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

[12] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

[13] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

[14] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

submitted for a first review by the Safety Standards Committees at their meetings in mid-2013 for wider consultations in Member States during the second half of 2013.[15]

14. The Nuclear Security Guidance Committee (NSGC), established in March 2012, had its second and third meetings in December 2012 and May 2013, respectively. At these meetings, the NSGC began to fulfil its function of reviewing and approving proposals for the development of publications, and the text of drafts for publication in the IAEA Nuclear Security Series and those draft safety standards where there is an interface with nuclear security. The NSGC also reviewed and provided advice on the Secretariat's plans for the development of nuclear security guidance publications over the coming years.[16]

15. In addition to the establishment of the NSGC, an Interface Group composed of the chairs of the Safety Standards Committees (SSCs) and four members of the NSGC was also established. The objective of this Interface Group is to identify interfaces between safety and security in publications being developed for the IAEA Safety Standards Series and the IAEA Nuclear Security Series. The Interface Group held its first meeting in September 2012 and decided which of the safety standards and nuclear security guidance publications under development should be treated as 'interface documents' and reviewed by both NSGC and one or more of the safety standards committees. Since this meeting, consultation with the Interface Group has continued electronically for all newly proposed publications in these Series.[17]

C. Nuclear Installation Safety

16. The Agency continued to assist in developing and improving national infrastructure in both Member States with existing nuclear power programmes and those expanding or planning to embark on such a programme. The Agency also assisted Member States to develop and improve an adequate legal and regulatory framework and to establish and sustain an effectively independent and competent regulatory body to enable them to discharge their regulatory functions.[18]

17. The Agency organized the International Conference on Effective Nuclear Regulatory Systems: Transforming Experience into Regulatory Improvements, in Ottawa, Canada in April 2013. About 250 participants from 43 countries and six international organizations attended the Conference. The Conference concluded on six action items including a proposal to establish a regulatory operating experience programme to collect, analyse and share regulatory experience and to promote safety and security culture as a blame free, but accountable, culture based on self-assessment and peer reviews.[19]

18. Over 50 activities in the area of governmental and regulatory infrastructure were implemented during the reporting period through national and regional technical cooperation (TC) projects. Eight activities were implemented under interregional and regional TC projects concerning the establishment of safety infrastructures and regulatory frameworks for Member States considering or having already decided to embark on a nuclear power programme. While most of these activities were

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[15] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

[16] This relates to operative paragraph 6 of resolution GC(56)/RES/9.

[17] This relates to operative paragraph 6 of resolution GC(56)/RES/9.

[18] This relates to operative paragraph 2 of resolution GC(56)/RES/9.

[19] This relates to operative paragraph 6 of resolution GC(56)/RES/9.

workshops or training activities that provided guidance and information on all the elements of establishing an effective safety infrastructure laid out in *Establishing the Safety Infrastructure for a Nuclear Power Programme* (IAEA Safety Standards Series No. SSG-16, hereafter referred to as SSG-16), some activities specifically focused only on the regulatory framework element of SSG-16.[20]

19. In the reporting period, twelve expert missions and scientific visits were implemented under national TC projects designed to enhance the national regulatory frameworks of Member States considering or having already decided to embark on a nuclear power programme, including Bangladesh, Belarus, Egypt, Indonesia, Jordan, Malaysia, Nigeria, the Philippines, Poland, Turkey, United Arab Emirates and Vietnam. Additionally, one regional workshop, in Vienna, Austria (November 2012), and five national workshops on the development of the legal and regulatory framework for nuclear safety and on drafting regulations on nuclear and radiation safety were conducted in Belarus (October 2012), the Islamic Republic of Iran (January 2013), Malaysia (October 2012), the Philippines (November 2012) and Poland (February 2013), under the auspices of the TC programme.[21]

20. The Agency developed standard training packages for safety regulations, human resource development, regulatory review and assessment, and regulatory inspection and enforcement. The packages are already being used in Agency workshops and expert missions. In December 2012, a Training Workshop on Human Resource Management for Regulatory Bodies was conducted in Nigeria.[22]

21. In the reporting period, nine regional and national workshops on the application and the methodology for self-assessment against SSG-16 and on the Integrated Review of Infrastructure for Safety (IRIS) software were conducted in Vienna, Austria (November and December 2012 and May 2013), and in Egypt (November 2012), Indonesia (January 2013), Jordan (March 2013), the Philippines (December 2012), Poland (July 2012) and Tunisia (July 2012).[23]

22. Three expert missions took place in Bulgaria (November 2012), Indonesia (July 2012) and Nigeria (September 2012) to review the status of the regulatory infrastructures for safety, including a review of specific regulations and a review for compliance of national legislation with international requirements. Safety reviews of regulatory infrastructure were conducted for the Integrated Regulatory Review Service (IRRS) missions in Poland (April 2013) and as part of the Integrated Nuclear Infrastructure Review missions in South Africa (February 2013) and Vietnam (December 2012).[24]

23. The Agency continued to seek to achieve consistency between the guidance in SSG-16 and related nuclear power infrastructure publications by ensuring close collaboration in the preparation and review of these publications between the groups responsible for them within the Secretariat.[25]

24. Cross-Departmental cooperation is also ensured in the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) activities (e.g. the INPRO Dialogue Forum's Workshop on Drivers and Impediments for Regional Cooperation on the Way to Sustainable Nuclear Energy Systems) and in Integrated Nuclear Infrastructure Review missions. In the area of nuclear safety,

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[20] This relates to operative paragraph 2 of resolution GC(56)/RES/9.

[21] This relates to operative paragraphs 2 and 4 of resolution GC(56)/RES/9.

[22] This relates to operative paragraph 2 of resolution GC(56)/RES/9.

[23] This relates to operative paragraphs 2 and 12 of resolution GC(56)/RES/9.

[24] This relates to operative paragraphs 2 and 12 of resolution GC(56)/RES/9.

[25] This relates to operative paragraphs 2 and 12 of resolution GC(56)/RES/9.

INPRO identified a set of user requirements that are based on the Agency's safety standards and serve as recommendations to designers on how to improve the level of safety in new reactors.[26]

25. The Agency drafted the IAEA Nuclear Energy Series publication *Legal and Institutional Issues of Transportable Nuclear Power Plants*, which was approved by the Agency's Publications Committee in April 2013. In addition, an INPRO Steering Committee Meeting was held in May 2013 to decide on further actions to be taken.[27]

26. At an INPRO meeting in February 2013, the Agency provided support for a study on the applicability of the Safety Requirements *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1) to one of the Generation IV International Forum (GIF) innovative systems (sodium cooled fast reactor). This collaborative activity between GIF and the Agency is expected to be followed by similar studies for the other GIF systems.[28]

27. The Agency also provided support on the exchange of regulatory information and experiences regarding new nuclear power plant designs and design certification through continued participation in the Steering Technical Committee meetings of the Multinational Design Evaluation Programme (MDEP) and in meetings of specialized working groups, such as the Digital Instrumentation and Control Working Group of the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA). Workshops and Technical Meetings were held to support the safety assessment of new nuclear power plants in safety and design margins in Slovenia (November 2012) and probabilistic safety analysis and improved understanding of containment-related issues under severe accident conditions in Vienna, Austria (October 2012 and March 2013) and in Croatia (May 2013).[29]

28. The Agency continued to conduct IRRS missions during the reporting period. Three full scope IRRS missions were conducted in Finland (October 2012), Bulgaria (April 2013) and Poland (April 2013) and discussions were held on possible missions and follow-ups for the years 2014–2015. Preparatory steps were taken to organize missions to the United Kingdom (2013), the Czech Republic (2013), Belgium (2013) and Pakistan (2014). The tailored module to address the regulatory implications of the Fukushima Daiichi accident was revised and was included in the IRRS missions to countries with operating nuclear power plants.[30]

29. In support of the self-assessment of the national safety infrastructure against the relevant Agency safety standards for governmental, legal and regulatory frameworks for safety, the Self-Assessment of Regulatory Infrastructure for Safety (SARIS) software tool has been further developed. The question-sets for nuclear power plants, research reactors and fuel cycle facilities were revised to better serve the purposes of IRRS reviews and to bring them in line with the current Agency safety standards.[31]

30. In the framework of an agreement between the Agency and the European Commission, the 10-year programme of IRRS missions to European Union Member States was continued. Data and results of the IRRS missions held during the reporting period were analysed and prompt evaluations of the IRRS reports assessed the effectiveness of the missions held. A comprehensive report of the

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[26] This relates to operative paragraphs 12 and 16 of resolution GC(56)/RES/9.

[27] This relates to operative paragraph 16 of resolution GC(56)/RES/9.

[28] This relates to operative paragraphs 12 and 36 of resolution GC(56)/RES/9.

[29] This relates to operative paragraphs 36 and 37 of resolution GC(56)/RES/9.

[30] This relates to operative paragraph 9 of resolution GC(56)/RES/9.

[31] This relates to operative paragraphs 4 and 9 of resolution GC(56)/RES/9.

analysis of the results of IRRS missions from 2006 to 2011 to countries with operating nuclear power plants was prepared.[32]

31. Senior regulatory officials of 13 Member States with extensive IRRS experience participated in a series of targeted meetings on the lessons learned from IRRS missions to enhance the effectiveness and efficiency of the missions. The *Integrated Regulatory Review Service (IRRS) Guidelines for the Preparation and Conduct of IRRS Missions* (IAEA-SVS-23) were published in May 2013.[33]

32. More than 60 activities were conducted involving over 700 participants from more than 65 Member States in safety networks under the Global Nuclear Safety and Security Network (GNSSN). These safety networks include global networks such as the International Regulatory Network (RegNet), the Technical and Scientific Support Organization Forum (TSOF) and the Global Safety Assessment Network (GSAN); regional networks such as the Asian Nuclear Safety Network (ANSN), the Arab Network of Nuclear Regulators (ANNuR), the Forum of Nuclear Regulatory Bodies in Africa (FNRBA) and the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO); and thematic networks such as the Regulatory Cooperation Forum (RCF), the Forum for Senior Regulators of CANDU Reactors, the WWER Regulators' Forum and the Control of Sources Network (CSN).[34]

33. The Steering Committee of the TSOF has established a working plan with several major activities including scientific and technical support for the implementation of the IAEA Action Plan on Nuclear Safety, the provision of training and tutoring to interested embarking countries in their effort to build up the capacity of technical support and scientific organizations, and the preparation of the International Conference on Challenges Faced by Technical and Scientific Support Organizations (TSO) in Enhancing Nuclear Safety and Security in Beijing, China in April 2014.[35]

34. RegNet is also one of many activities contributing to the IAEA Action Plan on Nuclear Safety and to the enhancement of regulatory body effectiveness by continuously disseminating and sharing regulatory knowledge and practices among Member States in a transparent manner. In June 2013, a Technical Meeting on RegNet provided feedback on the use of the RegNet website[36] and discussed further developments and interfaces of national sites. The meeting was attended by 30 Member States.[37]

35. As part of the development and promotion of RegNet, the Agency has worked on developing a specific section for regulators of States that do not have nuclear power programmes but have to control radiation sources in medical, industrial and research application, namely the CSN.[38] The CSN's objective is to address the special needs of regulators on all radiation safety issues, and to facilitate their cooperation.[39]

36. The RCF, which is also accessible under RegNet, is a Member-State-driven forum of regulators of nuclear power, assisting in the development of effectively independent and robust nuclear safety

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[32] This relates to operative paragraphs 4 and 9 of resolution GC(56)/RES/9.

[33] This relates to operative paragraph 9 of resolution GC(56)/RES/9.

[34] This relates to operative paragraphs 10, 11 and 13 of resolution GC(56)/RES/9.

[35] This relates to operative paragraph 10 of resolution GC(56)/RES/9.

[36] See http://gnssn.iaea.org/regnet/default.aspx.

[37] This relates to operative paragraph 13 of resolution GC(56)/RES/9.

[38] See http://gnssn.iaea.org/CSN/default.aspx.

[39] This relates to operative paragraph 13 of resolution GC(56)/RES/9.

regulatory bodies. In the reporting period, the RCF expanded its membership to 23 members with Belarus and Nigeria being the latest Member States to join. The RCF expects to begin to provide support to Poland in 2013. The RCF continued its support for the Jordan Nuclear Regulatory Commission and the Vietnam Agency for Radiation and Nuclear Safety.[40]

37. In September 2012, the Convention on Nuclear Safety (CNS) presidency's kick-off meeting was held to discuss future steps in preparation for the 6th Review Meeting of Contracting Parties to the CNS to be held in 2014. In October 2012, the meeting of the CNS's officers discussed the content of the national reports to be prepared for the 6th Review Meeting taking into consideration the amendments to the guidance documents; means to implement the conclusions of the 2nd Extraordinary Meeting of the Contracting Parties to the CNS in the national reports; the practical organization of the next Review Meeting and of the work of the Working Group on Effectiveness and Transparency; and improvements to communication with the public and the media on the results of the CNS meetings.[41]

38. In December 2012, the Agency organized a preparatory meeting for the first meeting of the Working Group on Effectiveness and Transparency. In February 2013, the first meeting of the Working Group on Effectiveness and Transparency was held with the participation of 39 Contracting Parties. Based on feedback from the Contracting Parties and considering initial proposals made by Switzerland and the Russian Federation to amend the CNS, 14 areas to improve the effectiveness of the CNS were identified including: effectiveness of regulatory bodies, responsibility of licensee holders, safety culture and the review process of the CNS, maintaining containment integrity and avoiding off-site contamination. It was also decided that, for each area, a working paper would be developed providing a short description of the area and the objective of the improvements (evidence and examples) as well as the rationale for strengthening the effectiveness of the CNS. The working paper should also identify and analyse possible tools for the implementation of the improvements and propose appropriate actions. In May 2013, drafts for all working papers were discussed at the second meeting of the Working Group on Effectiveness and Transparency.[42]

39. The Agency continues to encourage Member States planning to embark on a nuclear power programme or to construct new nuclear power plants to become Contracting Parties to the CNS. During the reporting period, Cambodia became a Contracting Party to the CNS. Countries embarking on a nuclear power programme such as Belarus, United Arab Emirates and Vietnam are Contracting Parties to the Convention.[43]

40. In the reporting period, approximately 80 incident reports on nuclear power plants (NPPs) were submitted to the International Reporting System for Operating Experience (IRS) jointly operated by the Agency and the OECD/NEA. The Agency produced reports periodically to summarize the key lessons learned from event reports submitted to the IRS. These reports, together with all incident reports submitted are available to authorized users via the IRS web space.[44,45]

41. The Agency continued to operate the Incident Reporting System for Research Reactors (IRSRR) and the Fuel Incident Notification and Analysis System (FINAS) to promote the exchange of information and operating experience on research reactors and fuel cycle facilities. The IRSRR

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[40] This relates to operative paragraph 13 of resolution GC(56)/RES/9.

[41] This relates to operative paragraph 3 of resolution GC(56)/RES/9.

[42] This relates to operative paragraph 3 of resolution GC(56)/RES/9.

[43] This relates to operative paragraphs 3, 4 and 28 of resolution GC(56)/RES/9.

[44] See http://irs.iaea.org/.

[45] This relates to operative paragraphs 11 and 30 of resolution GC(56)/RES/9.

currently has 55 participating Member States, which operate more than 97% of the research reactors worldwide. Currently 27 Member States, operating more than 80% of the fuel cycle facilities worldwide, participate in FINAS.[46]

42. A Technical Meeting on the implications of the Fukushima Daiichi accident on the safety of fuel cycle facilities will be held in Vienna, Austria, in July 2013. This meeting will focus on the technical and institutional aspects related to performing safety reassessment of fuel cycle facilities in the light of the feedback from the Fukushima Daiichi accident.[47]

43. The Agency supported the technical implementation of 25 national and regional TC projects on new research reactor projects, operational safety, ageing management and utilization. The Agency is also conducting biennial workshops on the interface between safety and security of research reactors. The next workshop will be held in October 2013.[48]

44. The guidelines for the Integrated Safety Assessment for Research Reactors (INSARR) review service were revised to update references to the relevant Agency safety standards and account for the feedback from the INSARR missions conducted since its establishment, including organization of preparatory and follow-up missions and reporting. The guidelines document for the Safety Evaluation of Fuel Cycle Facilities During Operation (SEDO) review service has been developed and is expected to be published in 2013.[49]

45. The Agency conducted six safety expert missions at research reactors in Bangladesh (May, 2013), Egypt (April 2013), Malaysia (March 2013), Thailand (November 2012) and Uzbekistan (October 2012). These missions provided technical support for establishing an effective ageing management programme in accordance with *Ageing Management for Research Reactors* (IAEA Safety Standards Series No. SSG-10).[50]

46. The Agency conducted two regional meetings on the application of the Code of Conduct on the Safety of Research Reactors in Algeria (November 2012) and in Poland (October 2012). In November 2012, a workshop was held in Vienna, Austria, with the participation of 18 Member States. The workshop provided guidance based on the Code for establishing a decommissioning plan and for managing the safety of research reactors in extended shutdown stage.[51]

47. The Agency continued to support Member States in enhancing the safety of their research reactors. In the reporting period, 11 safety reviews and expert missions were conducted at research reactors in the Democratic Republic of the Congo, Egypt, Ghana, Indonesia, the Islamic Republic of Iran, Jordan, Kazakhstan, Morocco, Nigeria and Slovenia. In June 2013, the Agency held a workshop on the implications of the Fukushima Daiichi accident for the safety of research reactors. The workshop followed the guidelines provided in the Agency safety report on this topic, which is currently in the publication process.[52]

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[46] This relates to operative paragraphs 11 and 30 of resolution GC(56)/RES/9.

[47] This relates to operative paragraph 11 of resolution GC(56)/RES/9.

[48] This relates to operative paragraphs 2, 4, 6 and 35 of resolution GC(56)/RES/9.

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

[50] This relates to operative paragraphs 30 and 31 of resolution GC(56)/RES/9.

[51] This relates to operative paragraph 34 of resolution GC(56)/RES/9.

[52] This relates to operative paragraph 35 of resolution GC(56)/RES/9.

48. The Agency also conducted seven training workshops on the following topics in the area of research reactors: training and qualification (USA, October 2012); regulatory supervision (Vienna, November 2012); integrated management systems (Vienna, June 2013); assessment of safety documents (USA, December 2012); operational radiation protection and waste management (Vienna, March 2013); and operating programmes (USA, April 2013).[53]

49. Additionally, a regional workshop was conducted in Vietnam (December 2012) on the use of a graded approach in the application of the Agency's safety standards for research reactors and a second one in Vienna, Austria, (September 2012) for the Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA) on the safety and utilization of research reactors. The Agency also supported the implementation of the first meeting of the regional advisory safety committee for research reactors in Europe held in Romania (June 2013) and helped establish a similar group in the Asia and the Pacific region through a meeting held in Vienna, Austria (March 2013). The meetings discussed and shared experience on safety issues of common concern within the regions.[54]

50. The biennial Technical Meeting on the safety of research reactors under project and supply agreements was held in Vienna, Austria, in May 2013. The meeting identified actions to be taken by the operating organizations to further enhance the operational safety performance of their research reactors.[55]

51. The Agency continued to support Member States establishing their first research reactor and published *Specific Considerations and Milestones for a New Research Reactor Project* (IAEA Nuclear Energy Series NP-T-5.1), which provides practical guidance on the implementation of different phases and activities of a new research reactor project. A regional (ARASIA) workshop was held in Vienna, Austria, in September 2012 on the feasibility study and strategy for human resources development for research reactors. Three safety expert missions were conducted in Jordan (February 2013), Lebanon (December 2012) and Tunisia (March 2013) on new research reactor projects. These activities helped identify gaps and actions for further developing national regulatory and safety infrastructures.[56]

52. The Operational Safety Review Team (OSART) programme reached its 30-year anniversary and has completed 175 missions worldwide. During the reporting period, eight OSART missions and seven OSART follow up missions were performed, the highest number of OSART missions per year in the history of the OSART programme. The OSART missions were conducted in Brazil (August 2012), Bulgaria (November 2012), the Czech Republic (November 2012), France (November 2012 and June 2013), India (October 2012), Mexico (October 2012) and Switzerland (October 2012). The follow up missions were conducted in Armenia (June 2013), Brazil (December 2012), the Czech Republic (June 2013), France (June 2013), Russian Federation (May 2013), South Africa (April 2013) and USA (June 2013). Only two OSART missions were requested in 2013, despite the recommendation of the IAEA Action Plan on Nuclear Safety to strengthen the effectiveness of operating organizations, which calls upon countries with operating NPPs to voluntarily request an OSART mission in a three-year period following the approval of the Action Plan in September 2011.[57]

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[53] This relates to operative paragraphs 35 and 65 of resolution GC(56)/RES/9.

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

[55] This relates to operative paragraphs 11 and 35 of resolution GC(56)/RES/9.

[56] This relates to operative paragraph 35 of resolution GC(56)/RES/9.

[57] This relates to operative paragraphs 8, 9 and 11 of resolution GC(56)/RES/9.

53. The draft OSART guidelines on severe accident management were updated based on recent experience in their application as part of the standard review scope. Draft guidelines for OSART missions, to be conducted at the corporate headquarters of the nuclear utilities, were improved and are ready for application.[58]

54. An assessment of the OSART missions undertaken during the period from 2010 to 2012 summarized the most frequently occurring issues and also highlighted notable good practices and lessons learned related to operational safety. In addition, an overall evaluation of the missions was carried out in order to improve the quality and effectiveness of the OSART programme.[59]

55. With respect to global international cooperation, an enhanced memorandum of understanding was signed in September 2012 between the Agency and the World Association of Nuclear Operators (WANO) with the aim of improving nuclear safety standards in Member States, particularly in the area of operational safety. The Agency attended the WANO biennial meeting held in Moscow in May 2013. This provided a forum to liaise and to seek opportunities aimed at enhancing nuclear safety standards.[60]

56. In order to support safe and effective long term operation (LTO), a Safety Aspects of Long Term Operation of Water Moderated Reactors Peer Review Service (SALTO) mission or an LTO module within an OSART mission is systematically conducted in NPPs worldwide. Two SALTO missions, one follow-up SALTO mission and one LTO module within an OSART mission were performed in the reporting period in Armenia, Belgium, Hungary and Switzerland. In addition, three workshops or seminars to introduce the Agency's SALTO peer review service and to share lessons learned were conducted in Bulgaria, China and Mexico. To support these activities, the SALTO Guidelines were revised and a new area of human resources, competence and knowledge management for LTO was added based on Member States' requirements.[61]

57. There are also challenges related to the establishment of comprehensive ageing management programmes which need to be in place to ensure the fulfilment of the safety functions of the systems and components facing ageing effects and degradation processes. The International Generic Ageing Lessons Learned (IGALL) programme was launched in September 2010 with the aim to gather best international practices in ageing management. The programme will be finalized in September 2013 with an Agency safety report and a consolidated database.[62]

58. An Agency expert mission report on the review of the station blackout event that occurred at Kori 1 NPP, the Republic of Korea, in February 2012 was issued in July 2012. The mission made recommendations related to reporting and oversight arrangements, shift handovers and a corrective action programme.[63]

59. In the reporting period, the Site and External Events Design (SEED) review service was performed in six Member States: the Czech Republic, Indonesia, Japan, Kazakhstan, Turkey and

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[58] This relates to operative paragraphs 8, 9 and 11 of resolution GC(56)/RES/9.

[59] This relates to operative paragraphs 9 and 11 of resolution GC(56)/RES/9.

[60] This relates to operative paragraphs 11 and 29 of resolution GC(56)/RES/9.

[61] This relates to operative paragraph 31 of resolution GC(56)/RES/9.

[62] This relates to operative paragraphs 30 and 31 of resolution GC(56)/RES/9.

[63] This relates to operative paragraphs 30 and 31 of resolution GC(56)/RES/9.

Vietnam. In addition, ISSC provided support to Lebanon, Sri Lanka, Turkey and Vietnam on site safety and other related topics in the framework of the SEED service.[64]

60. The Agency held a Technical Meeting on the revision of *Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. NS-R-3) in December 2012, in Vienna, Austria, with the participation of 25 experts from Member States. Discussions identified areas where the publication needed to be changed to be more effective for Member States in the drafting of their national regulations.[65]

61. A workshop for the ISSC was conducted in October 2012, in Mumbai, India, with the participation of 67 international experts representing 13 Member States. The workshop aimed to collect information on actions undertaken by Member States with respect to multi-unit sites affected by multiple hazards and on approaches for safety assessments of such sites. Three draft safety reports that are being developed as a result of the needs highlighted by the Fukushima Daiichi accident were reviewed during the workshop. The results of the workshop and input from participating Member States will be incorporated in the update of these reports, which are expected to be published in 2013.[66]

62. In March 2013, the Nuclear Safety Standards Committee (NUSSC) Working Group to Discuss the Revision of Three Requirements: SSR 2/1, SSR 2/2 and GSR Part 4 meeting reviewed the proposed amendments to SSR-2/1, SSR-2/2 and GSR Part 4. The members of the Safety Standards Committees provided comments on the amendments to GSR Part 1 and NS-R-3 through the website of the Safety Standards Committees. It is expected that all these revised versions will be published in 2014.[67]

63. The Agency continued to support Member States in enhancing safety by implementing over 25 TC activities in the areas of deterministic and probabilistic safety analysis; verification and validation of computer codes; optimization of radiation protection in the design and operation of nuclear power plants; support for regulators of embarking countries; and fire protection.[68]

64. Two Generic Reactor Safety Review services for two new reactor designs, and two International Probabilistic Safety Assessment Review Team (IPSART) missions to Bulgaria and the Netherlands were initiated and/or completed. In addition, the Safety Assessment Advisory Programme, a new service for countries embarking on nuclear power programmes, was developed and will be applied in 2013.[69]

65. The Agency conducted several meetings to review safety standards documents and lessons learned from Fukushima Daiichi Accident, and the guidance documents for the Design and Safety Assessment Review Service, IPSART, and Review of Accident Management Programmes.[70]

66. Several activities were completed and others are progressing to support enhanced consideration of the effect of beyond design basis accident and design extension conditions on the resilience of

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[64] This relates to operative paragraphs 4, 9 and 11 of resolution GC(56)/RES/9.

[65] This relates to operative paragraphs 24 and 25 of resolution GC(56)/RES/9.

[66] This relates to operative paragraph 32 of resolution GC(56)/RES/9.

[67] This relates to operative paragraphs 25 and 32 of resolution GC(56)/RES/9.

[68] This relates to operative paragraph 4 of resolution GC(56)/RES/9.

[69] This relates to operative paragraph 9 of resolution GC(56)/RES/9.

[70] This relates to operative paragraphs 9 and 11 of resolution GC(56)/RES/9.

NPPs. These activities included the development of new tools to evaluate the robustness of NPPs such as the Fault Sequence Analysis and Accident State Monitor for Extreme Events and specialized workshops to enhance the application of fundamental concepts (e.g. defence in depth).[71]

67. The Agency has continued to support Member States in the area of safety culture through the preparation of guidance and the establishment of forums for the exchange of knowledge and experience. In September 2012, a new safety report was published entitled *Safety Culture in Pre-Operational Phases of Nuclear Power Plant Projects* (Safety Reports Series No. 74).[72]

68. The Agency is implementing a three-year project to enhance the safety culture in the three Latin American countries (Argentina, Brazil and Mexico) with operating nuclear power plants. Within the context of this project, the Ibero-American Nuclear Platform for Operators in the Area of Safety (PIANOS) was launched in 2013 to foster safety learning among the staff of the regional operators by offering them the possibility to directly engage in dialogue with their peers in other countries.[73]

D. Radiation Safety

69. *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards — Interim Edition* (IAEA Safety Standards Series No. GSR Part 3 (Interim), also referred to as the revised BSS) was issued in November 2011. Seven international organizations have completed their internal approval processes and have confirmed their intention to cosponsor GSR Part 3. These organizations are: the European Commission, the Food and Agriculture Organization of the United Nations, the International Labour Organization (ILO), the OECD/NEA, the Pan American Health Organization (PAHO), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO). The co-sponsored final edition of GSR Part 3 will be published late in 2013.[74]

70. The Agency continues to promote regional workshops to assist Member States with the implementation of GSR Part 3. In October 2012, a regional workshop for the Europe region took place in Ukraine and was attended by 28 participants from 17 Member States. The workshops followed a standard generic approach and 12 specific issues which are either new or strengthened in GSR Part 3 were discussed. Participants in the workshop identified topics requiring the development of guidance material. A fourth regional workshop is to be held in South Africa in 2013.[75]

71. A second regional workshop for Latin American and the Caribbean region was organized in cooperation with PAHO and hosted by the National Regulatory Authority for Radiation Protection (ARNR) in May 2013 in Uruguay. A total of 52 participants from 17 Member States and three non-Member States from the region took part in the workshop. The workshop supported the early development of safety guides to assist with the implementation of GSR Part 3 and highlighted the need to review national legislation on radiation protection. Detailed guidance on the implementation of, and ensuring compliance with, the new dose limit for the lens of the eye, and on managing the transition from an emergency exposure situation to an existing exposure situation were identified as priority

[71] This relates to operative paragraph 33 of resolution GC(56)/RES/9.

[72] This relates to operative paragraphs 11 and 35 of resolution GC(56)/RES/9.

[73] This relates to operative paragraphs 4, 9 and 11 of resolution GC(56)/RES/9.

[74] This relates to operative paragraph 38 of resolution GC(56)/RES/9.

[75] This relates to operative paragraph 38 of resolution GC(56)/RES/9.

issues. The workshop highlighted the need to review national legislation on radiation protection and the need to continue to improve radiation protection in medicine. The participants identified greater harmonization in the control of foodstuffs and commodities in the aftermath of a nuclear or radiological accident as an important international issue.[76]

72. The Agency organized a Technical Meeting on the New Dose Limits for the Lens of the Eye – Implications and Implementation in October 2012. The meeting was attended by 47 participants from 25 Member States and eight international organizations. The meeting concluded that education and training programmes are required to raise awareness of this issue and to ensure that the appropriate tools to reduce doses are made available to workers and are used effectively. A technical document on the implications of the new dose limit for the lens of the eye, based on the discussions at the meeting, is expected to be published in 2013.[77]

73. A regional meeting was held in Tunisia (June 2012) to agree on further activities in Africa supporting the implementation of the Agency's safety standards with regard to the development of national policies and strategies, strengthening the national infrastructure and regulatory frameworks for the protection of the public and the environment, and the safe management of radioactive waste. In cooperation with the FORO and a TC regional project, a meeting was held in Mexico (February 2013) to discuss activities for ensuring the safe management of radioactive sources with regard to recycling of scrap metal in the steel industries.[78]

74. Work is continuing on the development of Safety Guides that support implementation of GSR Part 3. Two draft Safety Guides, *Application of the Principle of Justification to Practices, including Non-Medical Imaging* (DS401) and *Protection of the Public against Exposure Indoors due to Natural Sources of Radiation* (DS421), have been updated to take account of comments from Member States, and will be submitted to the Safety Standards Committees and the CSS in 2013 for approval.[79]

75. The preparation of the Safety Guide entitled *Occupational Radiation Protection* (DS453) is continuing jointly with the ILO. The Safety Guide *Radiation Safety in Medical Uses of Ionizing Radiation* (DS399) is being developed jointly with WHO and PAHO. Three Safety Guides addressing public exposure and protection of the environment are also being developed jointly with UNEP: *Radiation Protection of the Public and the Environment* (DS432), *Radiological Environmental Impact Analysis for Facilities and Activities* (DS427) and *Regulatory Control of Radioactive Releases to the Environment from Facilities and Activities* (DS442).[80]

76. Implementation of the International Action Plan for the Radiation Protection of Patients endorsed by the IAEA General Conference in 2002 continues. The International Conference on Radiation Protection in Medicine – Setting the Scene for the Next Decade, hosted by the Government of Germany, was held in Bonn, in December 2012. The conference was co-sponsored by the WHO and attended by more than 500 participants from 77 Member States and 16 international organizations. One important outcome from the conference was the identification of the responsibilities of stakeholders regarding radiation protection in medicine for the next decade, outlined as the Bonn Call

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[76] This relates to operative paragraph 38 of resolution GC(56)/RES/9.

[77] This relates to operative paragraph 38 of resolution GC(56)/RES/9.

[78] This relates to operative paragraphs 4 and 38 of resolution GC(56)/RES/9.

[79] This relates to operative paragraphs 38 and 39 of resolution GC(56)/RES/9.

[80] This relates to operative paragraphs 38 and 39 of resolution GC(56)/RES/9.

for Action. International bodies were urged to take action to achieve the highest benefit with the least possible risk to all patients.[81]

77. The Agency organized a Technical Meeting on Justification of Medical Exposure and the Use of Appropriateness Criteria in March 2013, where developers of referral guidelines explored ways of harmonizing the development processes. A new publication entitled *Radiation Protection in Paediatric Radiology* (Safety Reports Series No. 71) was issued in 2012. A new comprehensive patient radiation protection training package for physicians using fluoroscopy outside radiology (e.g. urologists, gastroenterologists and orthopaedic surgeons) has also been issued.[82]

78. In December 2012, the Agency released a voluntary safety reporting system for radiotherapy called Safety in Radiation Oncology (SAFRON). This system will be linked with other national and local reporting systems, as they become available, to make safety reports from around the world more accessible for educational purposes. SAFRON currently contains over 1100 reports on radiotherapy safety-related events for the information of health professionals. An educational reporting system on Safety in Radiological Procedures is being finalized for general use.[83]

79. The Agency officially cooperated with the organization of the 7th International Symposium on Naturally Occurring Radioactive Material held in Beijing, China in April 2013. The symposium concluded that there are several challenges in managing exposure to NORM such as regulatory aspects, application of the graded approach, operational issues, monitoring strategies, management of residues, and stakeholder involvement and public communication. The symposium attracted 146 participants from 36 countries. The publications *Radiation Protection and NORM Residue Management in the Titanium Dioxide and Related Industries* (Safety Reports Series No. 76) and *Radiation Protection and Management of NORM Residues in the Phosphate Industry* (Safety Reports Series No. 78) were issued in 2012 and 2013 respectively. Two regional workshops on NORM were held in the Asia and the Pacific and Africa regions.[84]

80. The Agency launched the Modelling and Data for Radiological Impact Assessments (MODARIA) programme during a Technical Meeting in November 2012. The meeting was attended by 150 participants from 40 Member States. The MODARIA programme aims to maintain and develop capabilities in the field of environmental modelling and radiological assessments of radiation exposures to people and the environment in planned, existing and emergency exposure situations. The MODARIA programme is scheduled for four years.[85]

81. The Agency continued its advisory work with the Convention on the Protection of the Marine Environment of the Baltic Sea Area, with the Convention for the Protection of the Marine Environment of the North-East Atlantic and with the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. The work focused on the development of methodologies and guidance for the evaluation of the radiological impacts on the public and environment from natural and man-made radionuclides in marine systems in an integrated approach to

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[81] This relates to operative paragraph 39 of resolution GC(56)/RES/9.

[82] This relates to operative paragraph 39 of resolution GC(56)/RES/9.

[83] This relates to operative paragraph 40 of resolution GC(56)/RES/9.

[84] This relates to operative paragraphs 4 and 41 of resolution GC(56)/RES/9.

[85] This relates to operative paragraphs 41 and 59 of resolution GC(56)/RES/9.

be applied under these Conventions. This work also applies to the implementation of the requirements set out in GSR Part 3.[86]

82. The Agency is continuing its work on the Information System on Occupational Exposure in Medicine, Industry and Research and the Directory of Radiotherapy Centres which are used as inputs by UNSCEAR in its assessments. Information on occupational radiation protection in developing countries gathered through the Occupational Radiation Protection Networks database will be provided to UNSCEAR. The redesign of the Agency's Database on Discharges of Radionuclides to the Atmosphere and Aquatic Environments was concluded; the data will be used by the Agency to inform the public about discharges of radionuclides from nuclear facilities, and UNSCEAR will use these data as inputs for assessing radiological impacts to the public arising from those discharges.[87]

83. The Agency collaborated with UNSCEAR on the assessments of exposures to the public and radiological impacts to the environment as a consequence of the Fukushima Daiichi accident.[88]

84. The Agency also continues to follow the activities of the ICRP through staff nominated to represent the Agency in the individual ICRP Committees.[89]

85. The Agency is continuing its cooperation with OECD/NEA to jointly operate the Information System on Occupational Exposure (ISOE). The Agency encourages Member States to host and participate in ISOE activities.[90]

E. Transport Safety

86. The 2012 Edition of the Agency's *Regulations for the Safe Transport of Radioactive Material* (IAEA Safety Standards Series No. SSR-6) (the Transport Regulations) was published in October 2012. The review cycle for the 2012 Edition of the Transport Regulations and the corresponding *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material* began in January 2013. The decision to enter another revision cycle for the Transport Regulations will be made at the 27th meeting of the Transport Safety Standards Committee (TRANSSC) in November 2013.[91]

87. A Technical Meeting held in March 2012 further addressed the President's findings from the 2011 International Conference on the Safe and Secure Transport of Radioactive Material: The Next Fifty Years of Transport – Creating a Safe, Secure and Sustainable Framework (Transport Conference).[92]

88. Agency staff attended meetings of the International Civil Aviation Organization (ICAO), International Maritime Organization (IMO), and the 42nd United Nations Economic Commission for

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[86] This relates to preambular paragraph (p) of resolution GC(55)/RES/9.

[87] This relates to operative paragraph 42 of resolution GC(56)/RES/9.

[88] This relates to operative paragraph 42 of resolution GC(56)/RES/9.

[89] This relates to operative paragraph 42 of resolution GC(56)/RES/9.

[90] This relates to operative paragraph 42 of resolution GC(56)/RES/9.

[91] This relates to operative paragraph 54 of resolution GC(56)/RES/9.

[92] This relates to operative paragraph 43 of resolution GC(56)/RES/9.

Europe (UNECE) Sub-Committee of Experts on the Transport of Dangerous Goods, to discuss issues related to radioactive material transport and further efforts to harmonize transport regulations.[93]

89. In June 2013, the International Steering Committee on Denials of Shipment met for the eighth and final time, transferring their responsibilities to a United Nations inter-agency group supported by the existing networks of national focal points and regional coordinators for denial in cooperation with TRANSSC. The IAEA Director General closed the meeting, emphasizing the global nature and importance of shipments of radioactive material and thanking the members of the Steering Committee for their significant efforts in reducing denials.[94]

90. Following the direction provided in resolution GC(53)/RES/10 of 2009, the Agency will hold a Technical Meeting in 2013 to take into account the scientific evidence of changing global weather patterns, changes to infrastructures and changes to industry operations in the ongoing review of the relevant Agency safety standards related to transport.[95]

91. A training workshop on implementation of the Transport Regulations and compliance assurance was held by the Agency in Brazil (December 2012) for Member States in the Latin America region, including the Caribbean. Furthermore, operational experience from those who conduct transport operations has been shared in the TRANSSC meetings.[96]

92. Informal discussions on effective communication between relevant shipping and coastal States, with Agency participation, were held during the General Conference in 2012. A working group met in late 2012 and 2013 to begin development of best practice guidelines for intergovernmental communications on the transport of radioactive material.[97]

93. The Agency's outreach efforts included updates to an information video on transport, and publication of a brochure on the problem of denials of shipment. Translation of these information resources has begun. Development of a transport web portal to allow easy access to relevant information for the global transport community has begun.[98]

94. Agency regional TC projects featuring transport safety have included a training course in the Asia and the Pacific region (November 2012), a coordination meeting in Africa (July 2012) and a workshop in Latin America including the Caribbean (December 2012). Three African Member States received mini-Transport Safety Appraisal Service (TRANSAS) missions through a TC project and delegates from two of those Member States attended the 26th TRANSSC meeting. Finally, an interregional TC project entitled on "Sustaining the Safe Transport of Radioactive Material by Promoting the Harmonization of Transport Regulations, Building Regulatory Capacity, and Outreach to the Transport Community to Address Global Issues Including Denial of Shipment" will capture experiences of participants and offer the opportunity for feedback from global transport experts.[99]

95. The ad-hoc Working Group on Air and Maritime Transportation of the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE), led by the ICAO, developed its terms of

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[93] This relates to operative paragraphs 43 and 51 of resolution GC(56)/RES/9.

[94] This relates to operative paragraphs 43, 51 and 52 of resolution GC(56)/RES/9.

[95] This relates to operative paragraphs 24 and 54 of resolution GC(56)/RES/9.

[96] This relates to operative paragraph 43 of resolution GC(56)/RES/9.

[97] This relates to operative paragraphs 46 and 47 of resolution GC(56)/RES/9.

[98] This relates to operative paragraphs 43, 46 and 47 of resolution GC(56)/RES/9.

[99] This relates to operative paragraphs 43, 51and 53 of resolution GC(56)/RES/9.

reference and work programme for the two-year period in February 2013, which were subsequently endorsed by the IACRNE.[100]

96. Revisions of the Safety Guide *Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material* (IAEA Safety Standards Series No. TS-G-1.2) and the Agency's publication *Manual for First Responders to a Radiological Emergency* (EPR-First Responders) have been initiated to incorporate maritime and air transport events.[101]

97. A training course on security in the transport of nuclear material has been developed accounting for recommendations for transport of nuclear material stated in the fifth revision of document INFCIRC/225 issued as *Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities* (IAEA Nuclear Security Series No. 13). The training course was piloted in August 2012.[102]

98. The Secretariat has explored virtual Internet-based meeting capabilities to facilitate the effective participation of all interested Member States in the development of safety standards. Given their potential for contributing to the process of developing safety standards, such virtual meetings are considered a tool that would assist in the holding of regional TRANSSC meetings, thus giving all Member States greater access to the committee and its work.[103]

F. The Safety of Spent Fuel and Radioactive Waste Management

99. A regional meeting on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) was held in South Africa, in October 2012. The meeting focused on the benefits of being a Contracting Party to the Joint Convention and involved extensive discussions with Contracting Parties on their experiences and a practical exercise on preparing a national report. The meeting was attended by 20 participants from 16 Member States of the Africa region.[104]

100. Two meetings of the General Committee of the Joint Convention took place in Vienna, Austria, in September 2012 and April 2013. The focus of the first meeting was on discussing the implementation of the recommendations from the Fourth Review Meeting. The focus of the second meeting was on the preparation of the First Inter-Sessional meeting of the Contracting Parties to the Joint Convention.[105]

101. Two meetings of the Presidents and Vice-Presidents of the Review Meetings of the Convention on Nuclear Safety and the Joint Convention were held in Vienna, Austria in September 2012 and April 2013. Both meetings focused on the establishment of a mechanism to ensure coherence between the

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[100] This relates to operative paragraph 48 of resolution GC(56)/RES/9.

[101] This relates to operative paragraphs 48 and 49 of resolution GC(56)/RES/9.

[102] This relates to operative paragraphs 43 and 50 of resolution GC(56)/RES/9.

[103] This relates to operative paragraph 27 of resolution GC(56)/RES/9.

[104] This relates to operative paragraph 55 of resolution GC(56)/RES/9.

[105] This relates to operative paragraph 55 of resolution GC(56)/RES/9.

rules governing the review process of the Joint Convention and those of the Convention on Nuclear Safety.[106]

102. The First Inter-Sessional meeting of the Contracting Parties to the Joint Convention was held in Vienna, Austria, in April 2013. The meeting was chaired by one of the Vice-Presidents and was attended by 68 delegates from 33 Contracting Parties. The focus of this meeting was to continue consideration of proposals to improve implementation of the Joint Convention, as requested by the plenary of the Contracting Parties at the Fourth Review Meeting, and to develop recommendations for consideration in a future meeting of the Contracting Parties.[107]

103. The first meeting of the Working Group of Experienced Officers of the Convention of Nuclear Safety and the Joint Convention was held in Vienna, Austria in January 2013. This Working Group was created by the Presidents and Vice-Presidents of the Review Meetings of the Convention of Nuclear Safety and the Joint Convention at their meeting held in September 2012. The meeting was attended by 11 delegates from eight Contracting Parties. The focus of the meeting was to discuss and analyse feedback provided by experienced officers and to advise the Presidents and Vice-Presidents on the review process.[108]

104. In order to help Member States continue work on maintaining a high level of safety in the management of radioactive waste, the Agency launched in 2012 the two-year International Project on Human Intrusion in the Context of Disposal of Radioactive Waste. The objective of the project is to discuss technical, societal and design issues in relation to human intrusion scenarios for the safety case and the associated safety assessment of radioactive waste disposal facilities.[109]

105. In response to the need to develop further guidance on safety during the operation of geological disposal facilities, the International Project on Demonstration of the Operational and Long-Term Safety of Geological Disposal Facilities for Radioactive Waste (GEOSAF Part II) was launched during a Technical Meeting in March 2012. This project has been designed to define a structure and methodology for demonstrating the safety of geological disposal, integrating both the operational and post-closure phases of the development of a geological disposal facility. The Agency organized a meeting in May 2013, which was attended by 30 participants from 20 Member States. During the meeting further material was developed on the interface between operational and long term safety of geological disposal facilities and a work plan has been developed for the coming year.[110]

G. The Safe Decommissioning of Nuclear Facilities and Other Facilities Using Radioactive Material

106. Iraq's nuclear infrastructure was mostly destroyed during the Gulf War of 1991. The subsequent looting of nuclear and radioactive material at facilities in Iraq, in 2003, created an immediate threat to public health and the environment. In 2004, the Government of Iraq requested the Agency to assist in the decommissioning and remediation of all 18 former nuclear facilities and sites throughout the

[106] This relates to operative paragraph 55 of resolution GC(56)/RES/9.

[107] This relates to operative paragraph 55 of resolution GC(56)/RES/9.

[108] This relates to operative paragraph 55 of resolution GC(56)/RES/9.

[109] This relates to operative paragraph 56 of resolution GC(56)/RES/9.

[110] This relates to operative paragraph 57 of resolution GC(56)/RES/9.

country, and to assist Iraq to rebuild its scientific capacity. In 2005, the Iraq Decommissioning Project (IDP) was initiated with the support of extrabudgetary contributions and with in-kind support from a number of Member States and experts from international organizations, governments and industry. Extrabudgetary contributions to support the IDP will not extend beyond October 2013, bringing the project to a close after eight years. A final report is being prepared to summarize the achievements of the project, and a side event is being planned for the 57th session of the General Conference to highlight the accomplishments of the IDP.[111]

107. Iraq's national infrastructures for decommissioning, remediation and radioactive waste management have improved since the inception of the project and particularly in the past year. Scientists, engineers and technicians in Iraq have successfully and independently decommissioned four of the former nuclear facilities in and around Baghdad and at Rashidiya. These decommissioning efforts were preceded by the establishment of regulatory oversight for licensing and inspection, the development of detailed decommissioning and waste management plans and the improvement of technical capacity in radiation protection and the use of special equipment through various training exercises. As a result of the strengthened nuclear capacity and infrastructure in Iraq, work on the more complex and challenging decommissioning and remediation problems is starting to be undertaken. The Agency has assisted Iraq in the development of decommissioning and remediation plans for four of the higher-risk facilities. These plans have been approved by the regulatory bodies in Iraq, and decommissioning for these facilities was initiated in January 2013. Although the IDP is coming to an end, there is still a need for focused efforts to ensure safe and timely decommissioning and remediation of former nuclear facilities and sites in Iraq.[112]

108. Entombment has been identified in the Agency's safety standards as one of the three basic decommissioning strategies. At a consultants' meeting in August 2012, the Agency launched a new activity to collect information on and discuss practical experience and lessons learned with entombment. Discussions at several international meetings, including the International Experts' Meeting on Decommissioning and Remediation after a Nuclear Accident (28 January–1 February 2013), have indicated that entombment cannot be ignored as a decommissioning option, and that further elaboration of this concept is needed.[113]

109. The Agency Safety Requirements publication *Decommissioning of Facilities Using Radioactive Material* (IAEA Safety Standards Series No. WS-R-5) issued in 2006 is under revision as draft standard DS450. In July 2012, a Technical Meeting reviewed DS450, which was subsequently sent to Member States for comment in September 2012. The final draft incorporating Member States' comments will be presented to the Safety Standards Committees for their approval and further submission to the Commission on Safety Standards in 2013. In parallel with the revision of the Safety Requirements, three facility-specific Safety Guides for decommissioning are also being revised.[114]

110. During the implementation of the Agency's projects for safety assessment for decommissioning, the International Project on Evaluation and Demonstration of Safety for Decommissioning of Facilities Using Radioactive Material (DeSa)[115] and the International Project on Use of Safety Assessment in

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[111] This relates to operative paragraph 58 of resolution GC(56)/RES/9.

[112] This relates to operative paragraph 58 of resolution GC(56)/RES/9.

[113] This relates to operative paragraph 60 of resolution GC(56)/RES/9.

[114] This relates to operative paragraph 60 of resolution GC(56)/RES/9.

[115] See http://www-ns.iaea.org/downloads/projects/archive/desa-project.pdf.

Planning and Implementation of Decommissioning of Facilities using Radioactive Material (FaSa)[116], it was recognized that management of a broader set of project risks is also important for achieving safe decommissioning. In particular, it was recognized that there is a need to collect and exchange related experience and to provide recommendations on the application of risk management methodologies to decommissioning projects in order to assist regulators and implementers with decision making. In response to this need, the Agency launched a new International Project on Decommissioning Risk Management, which is being implemented under the International Decommissioning Network.[117]

111. Two workshops were organized in the reporting period under the Research Reactor Decommissioning Demonstration Project. The emphasis for both workshops was on implementation of decommissioning; previous workshops carried out under the project had focused on planning for decommissioning. The first workshop was hosted by the Australian Nuclear Science and Technology Organisation in May 2013 and focused on the decommissioning of the High Flux Australian Reactor. The second workshop was hosted by State University of New York in December 2012 and focused on the decommissioning of the research reactor at the Buffalo Materials Research Center.[118]

112. In January 2013, the Agency organized an International Experts' Meeting on Decommissioning and Remediation after a Nuclear Accident, which covered issues such as selection of strategies and end-states for decommissioning, safety criteria to be applied, safety assessment issues, integral consideration of radiological and non-radiological hazards, use of resources, prioritization of actions and applicability of the existing standards to decommissioning after unplanned events. These discussions formed a valuable basis for consideration in many decommissioning projects, as well as in projects related to legacy sites.[119]

H. Safety in Uranium Mining and Processing and Remediation of Contaminated Sites

113. A Workshop on Radiation Safety Aspects of Uranium Exploration and Mine Development for Regulators from Newcomer Countries was held in August 2012 in Vienna, Austria, with participants from 14 Member States. The purpose of the workshop was to present, review and discuss key training material developed by the Agency. The workshop provided a forum for regulators to provide feedback on draft training material and to identify specific areas where the material could be enhanced or further developed. Regional workshops are planned for Asia and Africa in the last quarter of 2013 using material revised after the August 2012 workshop. Complementary training materials on the mitigation of impacts to the public from uranium legacy sites and the review of remediation plans will be developed through a series of meetings planned for 2013–2014.[120]

114. The Agency continues to support Member States in establishing and improving safety infrastructures for management of NORM residues. A meeting was held in September 2012 in Vienna, Austria, to revise *Management of Radioactive Waste from the Mining and Milling of Ores* (IAEA

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[116] See http://www-ns.iaea.org/tech-areas/waste-safety/fasa/.

[117] This relates to operative paragraph 60 of resolution GC(56)/RES/9.

[118] This relates to operative paragraph 58 of resolution GC(56)/RES/9.

[119] This relates to operative paragraph 60 of resolution GC(56)/RES/9.

[120] This relates to operative paragraph 61 of resolution GC(56)/RES/9.

Safety Standards Series No. WS-G-1.2). The revised safety standard, *Management of Radioactive Residues from Mining, Mineral Processing and other Naturally Occurring Radioactive Material (NORM) Activities* (DS459), will have an expanded scope, including guidance for management of NORM residues in addition to uranium and thorium, as well as reuse and recycling of residues. As a result of the expanded scope for DS459 a Technical Meeting is being planned for September 2013 to gather the views of Member States that have NORM management issues.[121]

115. The Agency Safety Guide *Remediation Process for Areas Affected by Past Activities and Accidents* (IAEA Safety Standards Series No. WS-G-3.1) was approved for revision in late 2012. The first meeting to revise WS-G-3.1 was held in March 2013. The Safety Guide addresses remediation of contaminated areas in the context of both post-accident and legacy site situations. The revision of WS-G-3.1 will, inter alia, take into account GSR Part 3, the findings and recommendations of the International Experts' Meeting on Decommissioning and Remediation after a Nuclear Accident (28 January to 1 February 2013, Vienna, Austria) and recent experience in Member States.[122]

116. Under the IAEA's International Working Forum on Regulatory Supervision of Legacy Sites (RSLS), an event was held in August 2012 in Colorado, USA. The event focused on the management and regulatory oversight of uranium legacy sites and it combined scientific visits with an international workshop. The scientific visits covered all major aspects for the lifecycle management of uranium production facilities. The event drew 28 participants from 20 countries, covering all major regions of the world. A similar event is being planned under the RSLS for 2013 in Canada.[123]

117. The Agency presented terms of reference for the Coordination Group for Uranium Legacy Sites (CGULS) at a Technical Meeting in June 2012 in Vienna, Austria. Subsequently, the terms of reference was sent to relevant Member States and international organizations for their endorsement which was received. This group is being established to provide technical coordination for multilateral initiatives to remediate former uranium production sites in Central Asia. The CGULS initiative was launched at a Technical Meeting in June 2013 in Vienna, Austria. The Technical Meeting participants discussed and agreed on a CGULS strategic plan, which is currently being implemented.[124]

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

118. The Agency has developed a Strategic Approach to Education and Training in Nuclear Safety for the Period 2013–2020 (Strategic Approach).[125] The Strategic Approach identifies four key components: national strategies for capacity building; capacity building mechanisms; effective use of networking and regional and international cooperation; and management systems, competence and knowledge management. It also supports capacity building in line with the IAEA Action Plan on

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[121] This relates to operative paragraph 61 of resolution GC(55)/RES/9.

[122] This relates to operative paragraph 61 of resolution GC(56)/RES/9.

[123] This relates to operative paragraph 63 of resolution GC(56)/RES/9.

[124] This relates to operative paragraph 64 of resolution GC(56)/RES/9.

[125] Strategic Approach to Education and Training in Nuclear Safety for the Period 2013–2020, Note by the Secretariat 2013/Note 9.

Nuclear Safety, building upon the experience of Agency education and training activities since 2002.[126]

119. The Agency has offered guidance on how to examine national resources for education and training in a broader way through the development of capacity building self-assessment. The capacity building approach looks at education and training, human resource development, knowledge management and knowledge networks in an integrated way for regulators, operators, technical support organizations and other stakeholders. A Technical Meeting, held in Vienna, Austria, attended by 29 participants representing 25 Member States discussed various approaches for national evaluation of capacity building, placing special focus on the importance of the topic in the light of the Fukushima Daiichi accident.[127]

120. At the invitation of the Government of Jordan, a national workshop under a TC project was organized in Amman, Jordan, in May 2013 to disseminate the methodology for self-evaluation of capacity building activities and to provide hands-on practice in the use of the methodology. The workshop was attended by the participants of the Jordan Atomic Energy Commission, the Jordan Nuclear Regulatory Commission and the National Electric Power Company, who have also committed to conduct self-evaluations within the next year.[128]

121. A Capacity Building Management Group was established under the ANSN to coordinate implementation of capacity building activities in the region and a Capacity Building Thematic Committee was also established under the GNSSN to ensure experience and lessons are shared globally.[129]

122. In order to support capacity building of the ANNuR and FNRBA member countries, the Agency implemented two regional workshops inviting a total of 60 participants from 43 countries in September (Republic of Korea) and November (South Africa) 2012. Another workshop on the use of communication tools available on the GNSSN website was conducted among coordinators of topical groups for FNRBA and ANNuR. One of the outcomes of the workshop was a recognition that members of both regional networks will work together to improve regional capacity of regulatory bodies through sharing of relevant regulatory expertise, experience and information.[130]

123. The Agency and the FORO have over 15 years of cooperation in areas of mutual interest aimed at achieving a high level of radiation and nuclear safety in a sustainable manner. In the reporting period, the Agency has published two joint Agency-FORO publications in Spanish on application of risk analysis to radiotherapy (IAEA-TECDOC-1685/S) and on probabilistic safety assessment for radiotherapy treatments with accelerators (IAEA-TECDOC-1670/S). In addition, a stress test evaluation of nuclear power plants of the Ibero-American region was completed in July 2012 and the results of the project on long term operation of nuclear power plants are available in Spanish and English at the FORO's recently updated website.[131,132]

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[126] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

[127] This relates to operative paragraph 13 and 65 of the GC(65)/RES/9.

[128] This relates to operative paragraph 65 of the GC(65)/RES/9.

[129] This relates to operative paragraphs 13 and 65 of the GC(65)/RES/9.

[130] This relates to operative paragraphs 13 and 65 of the GC(65)/RES/9.

[131] See http://www.foroiberam.org.

[132] This relates to operative paragraphs 13 and 65 of the GC(65)/RES/9.

124. As part of the Agency's support to the FORO's project on strengthening regulatory competence, two meetings were held in Brazil (April 2013) and Mexico (September 2012). During these meetings, progress was made in the use of the Systematic Assessment of Regulatory Competence Needs (SARCoN) model in developing specific competence profiles for the role of inspector, assessor and project coordinator with a focus on regulatory activities of nuclear power plants.[133]

125. The terms of reference for the Capacity Building Management Group of ANSN, endorsed in April 2013, assume that countries participating in the ANSN will voluntarily conduct self-assessments of their national capacity and invite evaluation missions consisting of Agency and external experts in order to coordinate activities filling the gaps identified during self-assessment. This will allow countries in the region to improve their institutional capacity and to build regulatory competence.[134]

126. In October 2012, the annual meeting of the Topical Group on Education and Training of the ANSN met in Vienna and agreed on the programme run by the Group in support of national efforts to build capacity in the region. A seminar on national policy and strategies for human resources development was conducted after the annual meeting.[135]

127. The annual meeting of the Steering Committee on Competence of Human Resources for Regulatory Bodies was held in December 2012 with the participation of 20 Member States. The Steering Committee shared experiences in the implementation of national activities and advised the Agency on how it could best support Member States' needs in education and training.[136]

128. The 14th annual Agency Basic Professional Training Course (BPTC) was held in Argentina (September–December 2012) for the Latin America region and another meeting on the BPTC was held in the Republic of Korea in April 2013. A regional ANSN Regulatory Control Course was held in the Republic of Korea in May 2013 and two workshops were conducted on practical training for regulators in Thailand in March and in the Republic of Korea in June of 2013.[137]

129. Member States' national education and training programmes were supported under the TC programme by six workshops on regulatory control, human resources development and SARCoN in the Philippines (July 2012), Thailand (November 2012), the Islamic Republic of Iran (January 2013), Poland (February 2013), and Turkey (October 2012 and February 2013).[138]

130. Efforts continued to strengthen systems in the areas of competence and knowledge management. For example, a new safety report on managing regulatory body competence was finalized and is expected to be published in 2013. The safety report provides guidelines based on Agency safety standards on managing the competence of the regulatory body and on establishing training and development programmes for regulatory staff.[139]

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[133] This relates to operative paragraphs 13, 65 and 66 of resolution GC(56)/RES/9.

[134] This relates to operative paragraphs 13, 65 and 66 of resolution GC(56)/RES/9.

[135] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

[136] This relates to operative paragraph 65 of resolution GC(56)/RES/9.

[137] This relates to operative paragraphs 13, 65 and 66 of resolution GC(56)/RES/9.

[138] This relates to operative paragraphs 4, 65 and 66 of resolution GC(56)/RES/9.

[139] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

131. A project plan was developed and a kick-off meeting was held with the purpose of updating the *Regulatory Control of Nuclear Power Plants Part A (Textbook)* (Training Course Series No. 15) and its associated Workbook. This project will be undertaken during 2013.[140]

132. A Training Course on Tsunami Hazard Assessment was held in August 2012 in Vienna, Austria, with the participation of 10 trainees from 10 Member States. Lectures were given on tsunami simulation and hazard assessment methodologies, and instruction given on operational methodologies of tsunami analysis software. The training provided the opportunity for the participants to actually use the software in solving sample problems. The participating countries were provided with the software to continue with their site specific assessments.[141]

133. Training activities on safety culture topics were addressed at a three-week safety culture self-assessment training course for regulatory bodies held in Pakistan in April–May 2013.[142]

134. In strengthening and expanding training activities on the safety of fuel cycle facilities, the Agency conducted two workshops on regulatory supervision (April 2013) and on application of Agency safety standards for fuel cycle facilities (September 2012) with the participation of 21 Member States with fuel cycle facilities in Vienna, Austria. These workshops improved the participating Member States' awareness of the Agency's safety standards that are relevant to such facilities and for best practices in their application, and provided a forum for exchange of information and experience to enhance the regulatory supervision of fuel cycle facilities, including application of the methodology of the Agency's Safety Evaluation of Fuel Cycle Facilities During Operation review service (SEDO).[143]

135. In the reporting period, the following key activities were completed and included in the Global Safety Assessment Network (GSAN): a methodology to evaluate competence needs in the area of safety assessment; the revision of the Safety Assessment Education and Training Programme and updated training material; and a new training course on plant walkdowns using the Zwentendorf NPP near Vienna, Austria, was developed and implemented with the participation of over 20 students from six Member States.[144]

136. The Agency's Steering Committee on Education and Training in Radiation Protection and Waste Safety met in December 2012 to advise the Agency on the implementation of the Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020 (Note by the Secretariat 2010/Note 44). The recommendations made by the Steering Committee covered areas such as the preparation of a syllabus for a master's degree in radiation protection and the safety of sources, monitoring of the establishment of national strategies to build competence in radiation protection through the Radiation Safety Information Management System, and providing expertise to assist Member States in establishing national strategies.[145]

137. The Agency's draft guidance to support Member States in building competence in radiation protection and the safe use of radiation sources via a national strategy for education and training in radiation, transport and waste safety was presented to Member States at regional workshops in Asia

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[140] This relates to operative paragraph 66 of resolution GC(56)/RES/9.

[141] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

[142] This relates to operative paragraph 66 of resolution GC(56)/RES/9.

[143] This relates to operative paragraph 66 of resolution GC(56)/RES/9.

[144] This relates to operative paragraph 66 of resolution GC(56)/RES/9.

[145] This relates to operative paragraph 65 of resolution GC(56)/RES/9.

(Thailand, July 2012) and in Latin America (Brazil, July 2012). The draft guidance has been amended in the light of feedback from the workshops, and it is expected to be finalized later this year. Follow-up regional workshops were held in Latin America (Bolivia, December 2012), Asia (Malaysia, June 2013) and Africa (Algeria, June 2013; Ghana, June 2013) to support Member States in sharing experiences and practices in establishing a national strategy for education and training in radiation, transport and waste safety. The workshops also provided an opportunity to review and update the radiation safety profile for education and training module in the Radiation Safety Information Management System.[146]

138. The Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources (which has a nominal duration of six months) was held in Argentina in Spanish, in Algeria in French, in Belarus in Russian, and in Ghana and Malaysia in English. The short term training events covered a wide range of topics, such as train-the-trainers courses for radiation protection officers (Kenya, July 2012; Senegal and South Africa, June 2013), orphan sources search (United Republic of Tanzania, July 2012; Morocco, December 2012), reduction of the risks from indoor radon (Indonesia, October 2012), radiation protection and optimization in digital radiology (Guatemala, September 2012), and authorization and inspection of radiation sources (Sudan, April to May 2013). The full list of training events for 2012 and 2013 is available on the Agency's website.[147]

139. The first issue of the Agency's Education and Training in Radiation, Transport and Waste Safety Newsletter[148] was published in August 2012. The newsletter was issued in response to the recommendations of the Agency's Steering Committee on Education and Training in Radiation Protection and Waste Safety calling for the enhancement of networking opportunities in order to, inter alia, disseminate the Agency's methodologies and approach to training, facilitate the optimization of resources within each region with regard to education and training, and facilitate the promotion of and access to education and training events.[149]

140. In addition to the activities supporting Member States in strengthening nuclear and radiation safety and security, the Agency has also enhanced its mechanisms and tools to capture and preserve the Agency's knowledge and organizational memory in nuclear safety and security. Several activities aiming to preserve, capture and enhance the transfer of the Agency's knowledge in nuclear safety and security are being developed.[150]

J. The Safety and Security of Radioactive Sources

141. In its continuous actions to support States in strengthening their national regulatory infrastructures for radiation safety and the control of radiation sources, the Agency has organized appraisal and advisory missions to assess the current situation and to monitor the progress made towards a harmonized global system, compliant with the Agency's safety standards. Expert missions, fellowships, training courses on authorization and inspection of radiation sources, maintenance of national registers of sources and regulatory information using the Regulatory Authority Information

[146] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

[147] This relates to operative paragraphs 65, 66 and 67 of resolution GC(56)/RES/9.

[148] See http://www-pub.iaea.org/MTCD/Publications/PDF/Newsletters/ET-NSRW-01.pdf.

[149] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

[150] This relates to operative paragraphs 65 and 66 of resolution GC(56)/RES/9.

System were also organized, under the TC programme and other extrabudgetary projects, and with high priority given to regions where the need is greatest. Networking of radiation safety regulators is being facilitated by the establishment of a dedicated web-site[151], the Control of Sources Network within the GNSSN platform. A Specific Safety Guide to provide guidance on establishing a roadmap for building a national radiation safety infrastructure is being developed. The Radiation Safety Information Management System is being used to monitor the status and progress in strengthening national regulatory infrastructures for radiation safety.[152]

142. The Self-Assessment of Regulatory Infrastructure for Safety methodology and tools used to assist Member States in reviewing their national regulatory infrastructure for the safe use of radioactive sources, as well as to support IRRS missions have been revised based on feedback from Member States and on revisions of the relevant Agency safety standards, including GSR Part 3.[153]

143. As of 30 June 2013, 117 States have made a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 81 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.[154] A total of 124 States have nominated points of contact for the purpose of facilitating the export and import of radioactive sources and have provided the details to the Agency.[155]

144. As recommended by the Open-ended Meeting of Technical and Legal Experts for Sharing of Information on States' Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources and its supplementary Guidance on the Import and Export of Radioactive Sources held in Vienna, Austria, in May 2010, two regional workshops were organized to foster information exchange on the implementation of the Code of Conduct and its supplementary Guidance in Europe in Albania (in English) in March 2013 and in Lithuania (in Russian) in May 2013. These workshops provided the opportunity to discuss the issues of safety and security of sources between neighbouring States, identifying progress made and challenges to be solved at the regional level, such as agreements between neighbouring States to strengthen the control of source transfers. Both workshops will provide their meeting's reports as input for the coming International Conference on the Safety and Security of Radioactive Sources: Maintaining the Continuous Global Control of Sources throughout their Life Cycle to be held in Abu Dhabi, United Arab Emirates, 27-31 October 2013.[156].

145. In accordance with the formalized process established in 2006 by Member States for the sharing of information as to States' implementation of the Code of Conduct on the Safety and Security of Radioactive Sources and its supplementary Guidance, the forthcoming International Conference on the Safety and Security of Radioactive Sources: Maintaining the Continuous Global Control of Sources throughout their Life Cycle, (27-31 October 2013, Abu Dhabi, United Arab Emirates) will provide a unique opportunity to review the status of implementation of the Code, exactly 10 years after its approval and endorsement by the Board and the General Conference. All States have been invited to

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[151] See http://gnssn.iaea.org/CSN/default.aspx.

[152] This relates to operative paragraphs 1, 2, 4, 68 and 69 of resolution GC(56)/RES/9.

[153] This relates to operative paragraphs 1, 2 and 69 of resolution GC(56)/RES/9.

[154] See also http://www-ns.iaea.org/tech-areas/regulatory-infrastructure/sat-tool.asp.

[155] This relates to operative paragraphs 69 and 70 of resolution GC(56)/RES/9.

[156] This relates to operative paragraph 71 of resolution GC(56)/RES/9.

present a national report to share their experience and lessons learned in implementing the Code and its supplementary Guidance.[157]

146. Progress has been made in the development of a Code of Conduct on the Transboundary Movement of Radioactive Material Inadvertently Incorporated into Scrap Metal and Semi-Finished Products of the Metal Recycling Industries (Metal Recycling Code of Conduct). During the Agency's 56th session of the General Conference in 2012[158], a side event focusing on the current status and future development of this Code of Conduct was co-organized by the Agency and Finland. The event gave Secretariat experts the opportunity to interact with Member States and inform them about the development and importance of this Code of Conduct.[159]

147. In February 2013, the third open-ended meeting of technical and legal experts to develop a non-binding instrument on the transboundary movement of scrap metal that may inadvertently contain radioactive material was organized. The objective of this meeting was to address the comments received from Member States and to finalize the text of the draft Metal Recycling Code of Conduct. Sixty-seven representatives from 55 Member States, one non-Member State, the EU and seven observers from the metal recycling industry reviewed the comments received and revised the draft accordingly. The new draft text and the chairman's report of the meeting are available on a dedicated web page[160] on the control of orphan sources and other radioactive material in scrap metal.[161]

148. The Metal Recycling Code of Conduct aims at harmonizing the approach of States to the discovery of the presence of radioactive material that may inadvertently be present in a consignment, and thereafter handling and managing it in a safe manner, so that it can be brought under regulatory control. The dedicated web page[162] has been created to increase awareness of this issue and of the work currently being carried out. The Metal Recycling Code of Conduct will supplement *Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries* (IAEA Safety Standards Series No. SSG-17), which provides recommendations, principally within a national context, on the protection of workers, members of the public and the environment in relation to the control of radioactive material inadvertently present in scrap metal.[163]

K. Nuclear and Radiological Incident and Emergency Preparedness and Response

149. Currently, there are 116 parties to the Convention on Early Notification of a Nuclear Accident (Early Notification Convention) and 110 parties to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Assistance Convention).[164]

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[157] This relates to operative paragraph 71 of resolution GC(56)/RES/9.

[158] See https://www.iaea.org/newscenter/news/2012/metalrecycling.html.

[159] This relates to operative paragraph 72 of resolution GC(56)/RES/9.

[160] See http://www-ns.iaea.org/tech-areas/radiation-safety/orphan-sources-scrap-metal.asp?s=3&l=22.

[161] This relates to operative paragraph 72 of resolution GC(56)/RES/9.

[162] See also http://www-ns.iaea.org/tech-areas/radiation-safety/orphan-sources-scrap-metal.asp?s=3&l=22.

[163] This relates to operative paragraph 72 of resolution GC(56)/RES/9.

[164] This relates to operative paragraph 73 of resolution GC(56)/RES/9.

150. Operational arrangements that have improved the implementation of the Early Notification and Assistance Conventions are mainly contained in the *Operations Manual for Incident and Emergency Communication* (EPR-IEComm 2012) and in the *IAEA Response and Assistance Network* (EPR-RANET 2013) publications. For the first time, the EPR-IEComm 2012 Manual places time expectations on the Secretariat and on Member States for the notification of emergencies and information exchange in emergencies. The revised EPR-RANET-2013 publication defines new areas of assistance (nuclear installation assessment and advice) in case a State may need and request assistance or advice on the on-site response to nuclear emergencies.[165]

151. Following recommendations of the International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies endorsed by the IAEA General Conference in 2004, the Secretariat established at the end of 2012 an Emergency Preparedness and Response Expert Group (EPREG). The group is composed of 16 senior experts appointed by the Deputy Director General, Head of the Department of Nuclear Safety and Security (DDG-NS), from the following regions, Africa, Asia and Pacific, Eastern Europe, Western Europe, North America and Latin America , with high professional competence in the field of preparedness for and response to nuclear and radiological emergencies. The aim of the group is to strengthen and sustain an efficient international emergency preparedness and response system by advising the Agency on strategic issues in emergency preparedness and response (EPR).[166]

152. In February 2013, the Secretariat convened the first meeting of EPREG. The EPREG Chairperson and Secretary were appointed by the DDG-NS. The EPREG Terms of Reference were endorsed by the EPREG and the EPREG website was explained and demonstrated by the Secretariat. EPREG members discussed a number of EPR issues needing enhancement taking into account activities recommended under the International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies and those activities planned in the IAEA Action Plan on Nuclear Safety.[167]

153. In June 2013, the Agency held a consultants' meeting on the recommendations for assistance compatibility (Radiation Survey) in Vienna, Austria. The purpose of the meeting was to develop guidance to assist States in harmonizing the different products that may be generated when radiological surveys are conducted during assistance missions. The meeting focused on the products, such as dose rate maps, generated during the conduct of radiological surveys by aerial, vehicle and/or ground based monitoring.[168]

154. The Agency's response capabilities are essential in fulfilling its obligations derived from the Early Notification and Assistance Conventions. Based on lessons identified, the Secretariat recognized the need to significantly strengthen the training of its own staff to enable them to participate in the Agency's Incident and Emergency System. The internal training and exercise programme was therefore updated and improved, as were the mechanisms for coordination with external contact points and the arrangements for cooperation at Departmental and interdepartmental level.[169]

155. The Agency, leading the IACRNE Working Group on Coordination of International Exercises, initiated preparation of the ConvEx-3 (2013) exercise that will build on the national exercise in

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[165] This relates to operative paragraph 74 of resolution GC(56)/RES/9.

[166] This relates to operative paragraph 81 of resolution GC(56)/RES/9.

[167] This relates to operative paragraph 75 of resolution GC(56)/RES/9.

[168] This relates to operative paragraph 76 of resolution GC(56)/RES/9.

[169] This relates to operative paragraph 78 of resolution GC(56)/RES/9.

Morocco. The Moroccan exercise will be based on a dirty bomb scenario giving the opportunity to check, among other EPR issues, the communication among the security and safety communities at international as well as national level. The exercise will be conducted in November 2013.[170]

156. The Agency's Response and Assistance Network (RANET) Capacity Building Centre in Fukushima Prefecture, supported by the Government of Japan, was established to help reinforce emergency preparedness and response activities by providing radiation monitoring equipment and training in emergency preparedness and response in Japan and the Asia and the Pacific region.[171]

157. The Agency welcomed the registration of three new Member States to RANET: Canada, Norway and the United Kingdom. These registrations increased RANET's membership to 22 Member States. In addition, Australia and the United States of America registered additional national assistance capabilities.[172]

158. In February 2013, representatives of Member States that registered national assistance capabilities in RANET met in Vienna, Austria, for a Technical Meeting. The experts discussed the EPR-RANET-2013 publication, steps to promote more registrations in the new functional area of nuclear installation assessment and advice, and the ongoing and future activities to provide international assistance. At the meeting, the experts also shared their experiences in activating and deploying national assistance capabilities to support an international emergency response.[173]

159. The Agency launched in September 2012 a database of radiation measurements results collected in Japan following the Fukushima Daiichi accident. The Fukushima Monitoring Database, available to all States and the public, provides the results of radiation measurements both near to and far from the power plant. The database also contains radiological monitoring information from Member States, which reported it to the Agency.[174]

160. The Fukushima Monitoring Database enables analysts to search and download measurement results such as dose rate measurements and measurements on environmental samples including leaves, water and soil. The data were collected as part of the Agency's role in implementing the Convention on Early Notification of a Nuclear Accident, under which Japan has been providing the Agency with information related to the accident.[175]

161. The Agency is revising *Preparedness and Response for a Nuclear or Radiological Emergency* (IAEA Safety Standards Series No. GS-R-2). During the reporting period, the Agency held seven consultancy meetings (two in July 2012, two in September 2012, October 2012, November 2012 and February 2013), a Technical Meeting (November 2012) and two IACRNE meetings (October 2012 and March 2013), all at its Headquarters in Vienna, Austria, with Member States and relevant international organizations to review the draft and gather feedback. It is envisaged that the revised requirements will be published in 2015. In the revision of GS-R-2 special attention is given to the coordination of safety and security activities.[176]

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[170] This relates to operative paragraph 80 of resolution GC(56)/RES/9.

[171] This relates to operative paragraphs 75 and 77 of resolution GC(56)/RES/9.

[172] This relates to operative paragraph 77 of resolution GC(56)/RES/9.

[173] This relates to operative paragraph 77 of resolution GC(56)/RES/9.

[174] This relates to operative paragraphs 42 and 82 of resolution GC(56)/RES/9.

[175] This relates to operative paragraphs 42 and 82 of resolution GC(56)/RES/9.

[176] This relates to operative paragraphs 6 and 25 of resolution GC(56)/RES/9.

162. The IAEA Action Plan on Nuclear Safety called on Member States to conduct a prompt national review and thereafter regular reviews of their emergency preparedness and response arrangements and capabilities. The Agency is providing support and assistance in this respect through Emergency Preparedness Review (EPREV) missions. During the reporting period the Agency conducted EPREV missions to Armenia, Jordan, Kazakhstan, Lithuania and Uruguay.[177]

163. Based on lessons identified in past missions, various improvements have been made to the EPREV methodology, including extending the duration of review to enable an even more comprehensive assessment of a State's EPR capabilities. The Agency held a meeting in June 2013 to critically review the EPREV guidelines and to determine areas for further improvement in order to fully reflect the lessons identified in response to the Fukushima accident.[178]

164. Based on Member States' decisions, EPREV reports are being made available on the IAEA Nuclear Safety Action Plan website, which enables easy sharing of good practices in emergency preparedness and response. In addition, summaries of the EPREV reports are posted on the IAEA Action Plan on Nuclear Safety website[179] accessible by the public.[180]

165. The Agency held two meetings (December 2012 and February 2013) to develop a document on an emergency public communications plan and strategy to be included as an attachment to the EPR-series publication *Communication with the Public in a Nuclear or Radiological Emergency* (EPR-Public Communications 2012). It is envisaged that the document will be published in late 2013.[181]

166. In November 2012, the Agency held a meeting to develop the scope of a briefing package intended to improve its own delivery of information in emergencies to Permanent Missions, the media and the public. The briefing package will include plain language explanations of topics that might need to be communicated in a nuclear or radiological emergency. It will facilitate the communication of technical information provided to and from the Agency. The briefing package will be rolled out in phases. The first phase on basics of radiation will be completed in 2013.[182]

167. In communication and information dissemination, the Agency is developing guidance for Member States to draft their national strategy and EPR plans for public communications in nuclear or radiological emergencies. In addition, the Agency EPR-series publication *Communication with the Public in a Nuclear or Radiological Emergency* is being translated into the Agency's official languages and into Japanese, with extrabudgetary funding from Japan, for implementation at regional and national workshops. The Agency is also working on its own communication capabilities and procedures to ensure that timely and clear information is disseminated to the public in an emergency.[183]

168. In cooperation with other relevant international organizations, the Agency is coordinating activities in public communications with the public information officers from IACRNE members. Activities include emergency exercises with a specific focus on public communications and newly

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[177] This relates to operative paragraph 9 of resolution GC(56)/RES/9.

[178] This relates to operative paragraph 9 of resolution GC(56)/RES/9.

[179] See http://www.iaea.org/newscenter/focus/actionplan/index.html.

[180] This relates to operative paragraph 11 of resolution GC(56)/RES/9.

[181] This relates to operative paragraph 79 of resolution GC(56)/RES/9.

[182] This relates to operative paragraph 79 of resolution GC(56)/RES/9.

[183] This relates to operative paragraph 23 of resolution GC(56)/RES/9.

introduced biannual meetings for the exchange of information on projects within the different organizations.[184]

169. In implementing the IAEA Action Plan on Nuclear Safety, the Secretariat analysed internal capabilities for assessment of possible radiological consequences and prognosis of likely emergency progression and identified areas needing improvement. The Secretariat also envisaged a process to be followed in order to effectively implement this broader response mandate for the Agency.[185]

170. Following the meeting of INES National Officers, the Agency prepared additional draft guidance on the use of INES in evolving severe accident situations. The document will be published as an annex to a technical document on the use of INES in the event communication process, which is under preparation. In the reporting period, Uruguay became part of the INES community by nominating an INES National Officer.[186]

L. Civil Liability for Nuclear Damage[187]

171. The 13th regular meeting of the International Expert Group on Nuclear Liability (INLEX) took place in Vienna in May 2013. INLEX discussed, inter alia, liability in the case of transport of nuclear material, focusing on the rights of non-nuclear transit States; liability issues in respect of transportable nuclear power plants; and the impact of the 2012 revision of the Agency's Transport Regulations on the Board of Governor's 2007 decision[188] to exclude small quantities of nuclear material from the scope of the nuclear liability conventions.

172. INLEX also discussed a paper on the benefits of joining the nuclear liability regime and developed corresponding key messages aimed to be used during legislative assistance activities carried out by the Agency.

173. The Secretariat reported to INLEX that, as part of the implementation of the IAEA Action Plan on Nuclear Safety, preparations are currently under way to conduct Agency INLEX missions in a number of interested Member States in the course of the year, in order to raise awareness of the international legal instruments relevant for achieving a global nuclear liability regime.

174. In addition, INLEX reviewed its outreach activities, which included the Second Workshop on Civil Liability for Nuclear Damage, held in Vienna, Austria, in May 2013. The workshop, which was organized by the Agency, aimed to provide diplomats and experts from Member States with an introduction to the international legal regime of civil liability for nuclear damage. The workshop was attended by 49 participants from 34 Member States and, in view of the positive feedback received from participants, it was decided to repeat it annually.

175. The Secretariat also informed INLEX that the Explanatory Text for the 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention had recently been

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[184] This relates to operative paragraph 79 of resolution GC(56)/RES/9.

[185] This relates to operative paragraphs 78 and 79 of resolution GC(56)/RES/9.

[186] This relates to operative paragraph 14 of resolution GC(56)/RES/9.

[187] This relates to operative paragraphs 18 and 45 of resolution GC(56)/RES/9.

[188] See GOV/DECISIONS 2006-2007, 2006-07/64 adopting the draft resolution in the Appendix to GOV/2007/39 (Corr.).

published as IAEA International Law Series No. 5. The next meeting of INLEX will take place in May 2014.

176. In the reporting period, two joint Agency-INLEX missions were held in South Africa (July 2012) and Ukraine (July 2012) and a follow-up mission to Vietnam will be held in July 2013.

List of Abbreviations

Action Plan	IAEA Action Plan on Nuclear Safety
ANNuR	Arab Network of Nuclear Regulators
ANSN	Asian Nuclear Safety Network
ARASIA	Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology
ARNR	National Regulatory Authority for Radiation Protection
Assistance Convention	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
BPTC	Basic Professional Training Course on Nuclear Safety
BSS	Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards — Interim Edition (IAEA Safety Standards Series No. GSR Part 3 (Interim)
CANDU reactor	Canada deuterium–uranium reactor
CGULS	Coordination Group for Uranium Legacy Sites
CNS	Convention on Nuclear Safety
ConvEx	Convention Exercise
CSN	Control of Sources Network
CSS	Commission on Safety Standards
DeSa	International Project on Evaluation and Demonstration of Safety for Decommissioning of Facilities Using Radioactive Material
Early Notification Convention	Convention on Early Notification of a Nuclear Accident
EPR	emergency preparedness and response
EPREG	Emergency Preparedness and Response Expert Group
EPREV	Emergency Preparedness Review
FaSa	International Project on the Use of Safety Assessment in Planning and Implementation of Decommissioning of Facilities using Radioactive Material
FINAS	Fuel Incident Notification and Analysis System
FNRBA	Forum of Nuclear Regulatory Bodies in Africa
FORO	Ibero-American Forum of Radiological and Nuclear Regulatory Agencies
GEOSAF	International Project on Demonstration of the Operational and Long-Term Safety of Geological Disposal Facilities for Radioactive Waste
GIF	Generation IV International Forum
GNSSN	Global Nuclear Safety and Security Network
GSAN	Global Safety Assessment Network
IACRNE	Inter-Agency Committee on Radiological and Nuclear Emergencies

ICAO	International Civil Aviation Organization
ICRP	International Commission on Radiological Protection
IDP	Iraq Decommissioning Project
IEC	Incident and Emergency Centre
IEM	international experts' meeting
IGALL	International Generic Ageing Lessons Learned
IMO	International Maritime Organization
INES	International Nuclear and Radiological Event Scale
INLEX	International Expert Group on Nuclear Liability
INPRO	Innovative Nuclear Reactors and Fuel Cycles
INSAG	International Nuclear Safety Group
INSARR	Integrated Safety Assessment for Research Reactors
IPSART	International Probabilistic Safety Assessment Review Team
IRIS	Integrated Review of Infrastructure for Safety
IRRS	Integrated Regulatory Review Service
IRS	International Reporting System for Operating Experience
IRSRR	Incident Reporting System for Research Reactors
ISOE	Information System on Occupational Exposure
ISSC	International Seismic Safety Centre
ITAG	International Technical Advisory Group
Joint Convention	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
LTO	long term operation
Metal Recycling Code of Conduct	Code of Conduct on the Transboundary Movement of Radioactive Material Inadvertently Incorporated into Scrap Metal and Semi-Finished Products of the Metal Recycling Industries
MDEP	Multinational Design Evaluation Programme
MODARIA	Modelling and Data for Radiological Impact Assessments
NORM	naturally occurring radioactive material
NPP	nuclear power plant
NSGC	Nuclear Security Guidance Committee
NUSSC	Nuclear Safety Standards Committee
OECD/NEA	Nuclear Energy Agency of the Organisation for Economic Co-operation and Development
OSART	Operational Safety Review Team
PAHO	Pan American Health Organization
PIANOS	Ibero-American Nuclear Platform for Operators in the Area of Safety

RANET	Response and Assistance Network
RCF	Regulatory Cooperation Forum
RegNet	International Regulatory Network
RSLS	International Working Forum on Regulatory Supervision of Legacy Sites
SAFRON	Safety in Radiation Oncology
SALTO	Safety Aspects of Long Term Operation
SARCoN	Guidelines for Systematic Assessment of Regulatory Competence Needs
SARIS	Self-Assessment of Regulatory Infrastructure for Safety
SEDO	Safety Evaluation of Fuel Cycle Facilities During Operation
SEED	Site and External Events Design
SSC	Safety Standards Committee
TC	technical cooperation
TRANSAS	Transport Safety Appraisal Service
TRANSSC	Transport Safety Standards Committee
TSO	technical scientific and support organization
TSOF	Technical and Scientific Support Organization Forum
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
WANO	World Association of Nuclear Operators
WHO	World Health Organization
WWER	water cooled water moderated power reactor