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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(54)/RES/7, a report including the following subjects is submitted to the Board of Governors and the General Conference for their consideration:

- The Agency's safety standards programme
- Civil liability for nuclear damage
- Nuclear installation safety
- Radiation safety
- Transport safety
- Safety of management of spent fuel and radioactive waste
- 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 in nuclear, radiation, transport and waste safety
- Safety and security of radioactive sources
- Preparedness and response for nuclear and radiological incidents and emergencies
- The accident at the Fukushima Daiichi nuclear power plant

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. General

1. This report has been produced for the fifty-fifth session (2011) of the General Conference in response to resolution GC(54)/RES/7, in which the General Conference requested the Director General to report in detail on implementation of this resolution, and further requested that the report be tailored to the General Conference resolution, and also include other relevant developments in the intervening period. This report covers the period 1 July 2010–30 June 2011.

2. The Agency continued its efforts to strengthen, 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 Secretariat also helped to increase regulatory effectiveness and encouraged regional safety forums and related networks.

3. The severe accident at the Fukushima Daiichi nuclear power plant in Japan on 11 March 2011 focused the world's attention on nuclear safety issues. Since then the Agency has worked actively to assist the plant operator and the Japanese authorities in bringing the situation back under control. The Agency also served as the international focal point for assistance, information-sharing and follow-up. A Ministerial Conference on Nuclear Safety was convened by the Agency on 24 May–2 June 2011. The report by the Director General on the outcome of the Ministerial Conference and a draft Action Plan will also be before the Board of Governors and the General Conference in September 2011.

B. The Agency's safety standards programme

4. In October 2010, the Agency's Safety Guide *Establishing the Safety Infrastructure for a Nuclear Power Programme* was approved by the Commission on Safety Standards (CSS) and published as Safety Series Guide No. 16 in 2011.[1] The objective of this Safety Guide is to assist Member States in applying the Agency's safety standards in a phased approach during the establishment of safety infrastructures for their nuclear power programmes. It identifies 200 actions that need to be completed by Member States from the moment that they decide to embark on a nuclear power programme to the point where a nuclear power plant (NPP) is actually ready for commissioning.

5. The Agency is preparing a safety package to assist in the implementation of the actions described in this Safety Guide. The safety package comprises 11 modules that include, inter alia, references to the relevant safety standards and safety review services, as well as appropriate tutorial material.

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[1] This relates to operative paragraph 9 of resolution GC(54)/RES/7

6. The Agency has also developed self-assessment guidelines to support this work. The guidelines include a questionnaire for Member States based on the Agency's safety standards and related computer software. The methodology adopted in the guidelines will be disseminated to Member States through regional and national workshops. This methodology was presented to the United Arab Emirates and Vietnam in 2011.

7. A two-week workshop was conducted by the Agency and hosted by the USA at the Argonne National Laboratory (ANL) in the last quarter of 2010. It provided an introduction to the process of establishing a safety infrastructure based on the application of Safety Series Guide No. 16.

8. Other workshops dealing with safety infrastructure have been conducted within the framework of the Agency's technical cooperation (TC) programme. Two workshops were held in Vienna in May 2011, one workshop on licensing and another on regulatory approaches.

9. Within the Agency itself, the Department of Nuclear Safety and Security is collaborating with the Department of Nuclear Energy to assist Member States in the development of their nuclear safety infrastructures. An executive training course on leadership and management in the area of safety was held in Paris in June 2011, and a similar course is planned for November 2011, to be held in the USA at the ANL. The Department of Nuclear Safety and Security also participates in the Integrated Nuclear Infrastructure Review Service (INIR) missions organized by the Department of Nuclear Energy.

10. A new module for Member States embarking on nuclear power programmes was incorporated into the Integrated Regulatory Review Service (IRRS). This module focuses on the governmental and regulatory framework components of safety infrastructure and will be utilized during the IRRS mission to the United Arab Emirates that is scheduled to take place later in 2011. The Agency has finalized a Safety Report, *Safety Culture in Pre-operational Phases of Nuclear Power Programmes*, which is now awaiting publication.

11. The Agency has launched an initiative to identify the potential safety related issues associated with transportable nuclear power plants (TNPPs), with particular attention given to floating reactors, which are designed to meet the energy needs of islands or remote areas. Construction of a floating nuclear power plant equipped with two small pressurized water reactors (150 MW(th) each) is underway in the Russian Federation.[2] The initiative will assess whether the current international legal framework and safety standards are applicable and appropriate for this technology. A Technical Document entitled *Legal and Institutional Issues of Transportable Nuclear Power Plants* is being developed under the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) and is expected to be published by the end of 2011. The preliminary assessment results are summarized in the paper entitled "Issues Related to Barge Mounted Transportable Reactors" that was prepared by the Agency and presented to the Safety Standards Committees and Commission on Safety Standards (CSS) at a meeting from 30 September to 1 October 2010. The CSS agreed that it would be premature at this stage to develop a Safety Guide on Barge Mounted Transportable Reactors and requested more information on the legal and institutional issues involved as well as a detailed design of the reactor.

12. As part of its programme to encourage the use of safety standards by Member States, the Agency held a workshop in Nairobi, Kenya, in October 2010, to obtain feedback and share experience on the implementation of the current International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS), to discuss amendments made during the drafting of the revised BSS and to identify areas that need further development. The workshop was

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[2] This relates to operative paragraph 13 of resolution GC(54)/RES/7.

attended by 16 participants from seven Member States. The participants endorsed the revised BSS and requested that the Agency develop guidelines on the implementation of the revised BSS, particularly in the areas of medical exposures; security-related screening; the protection of itinerant workers and female workers; the measurement of doses to the eyes of workers; and the application of the requirements regarding protection of the environment.[3]

13. The Agency, in collaboration with other joint sponsoring organizations, finalized its work on the revision of the BSS. Following the incorporation of comments received from Member States, the text was approved by the BSS Secretariat and by the Chairmen of the four Safety Standards Committees for submission to the CSS for endorsement. The CSS endorsed the fifth draft of the revised BSS in May 2011 (for further details of the approval process, see document GOV/2011/42). The revised BSS will be submitted to the September meeting of the Board of Governors.[4]

14. The Agency continued its work on the development of the Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR), conducting questionnaire-based surveys to gain further insight into occupational radiation protection in interventional cardiology and industrial radiography around the world. Consideration was given to the need for ISEMIR to complement future assessments by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).[5]

15. The Secretariat is exploring virtual Internet-based meeting capabilities to facilitate the effective participation of all interested Member States in the development of safety standards.[6] Several virtual meetings were held, resulting in increased participation and the involvement of Member States that had never participated before. Given their great potential for contributing to the process of developing safety standards, such virtual meetings are being considered as a tool to allow remote access to meetings of the Transport Safety Standards Committee (TRANSSC) in Vienna or to facilitate the holding of regional TRANSSC meetings, thus giving all Member States greater access to the Committee and its work.

C. Civil liability for nuclear damage[7]

16. The 11th meeting of the International Expert Group on Nuclear Liability (INLEX) took place from 25 to 27 May 2011 at the Agency's Headquarters in Vienna. The liability and compensation arrangements relating to the Fukushima Daiichi nuclear accident in Japan were a primary focus of the Group's work. Other major topics discussed during the meeting included, inter alia, the Workshop on the Prospects for a Civil Nuclear Liability Regime in the Framework of the European Union jointly organized in Brussels, in June 2010, by the European Commission (EC) and the Brussels Nuclear Law Association (BNLA), followed by the first meeting of the Working Group on Nuclear Liability in the European Union in Luxembourg in April 2011; the German proposals to allow Contracting Parties to exclude certain nuclear installations from the scope of application of the international nuclear liability

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[3] This relates to operative paragraph 19 of resolution GC(54)/RES/7.

[4] This relates to operative paragraph 21 of resolution GC(54)/RES/7.

[5] This relates to operative paragraph 22 of resolution GC(54)/RES/7.

[6] This relates to operative paragraph 23 of resolution GC(54)/RES/7.

[7] This relates to operative paragraph 14 of resolution GC(54)/RES/7.

conventions; INLEX's outreach activities; and the draft Explanatory Text on the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention.

17. With regard to the Fukushima Daiichi nuclear accident, the Group touched upon the precedent set by the 1999 accident at the Tokaimura nuclear fuel processing facility, the Fukushima Daiichi accident itself, and the related legal issues in connection with the application of the relevant Japanese legislation such as the channelling of liability to the operator, the government's indemnity in the case of an earthquake or tsunami, and the concept of exemption from liability in the case of "damage caused by a grave natural disaster of an exceptional character", as prescribed by the legislation.

18. With regard to the June 2010 workshop organized by the EC and the BNLA, and the first meeting, in April 2011, of the Working Group on Nuclear Liability that was established following the workshop, INLEX was informed that: (a) the purpose of that meeting was to explore common ground among the stakeholders and to discuss possible recommendations which could serve as a basis for a future EC proposal under Article 98 of the Euratom Treaty; (b) the EC did not want to pursue any option which would work against the possibility of the future creation of a global regime based on the 1997 Convention on Supplementary Compensation for Nuclear Damage (CSC); and that (c) the EC emphasized that any EC proposal would build on the current nuclear liability principles, including the channelling of liability exclusively to the operator.

19. With regard to the German proposals, the Group took note of the technical criteria for the exclusion of a nuclear installation set by the Radiation Safety Standards Committee (RASSC) and the Waste Safety Standards Committee (WASSC), and discussed a revised proposal submitted by Germany in May 2011. The Group agreed to defer its decision on the revised German proposal so as to give both Committees an opportunity to evaluate it properly, as well as to take into account further developments in this area initiated by the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD).

20. In addition, the Group reviewed INLEX's outreach activities with special reference to the Fifth Workshop on Civil Liability for Nuclear Damage, which was held in Moscow from 5 to 7 July 2010 and brought together various countries from Eastern Europe and Central Asia, and the International Workshop on the Convention on Supplementary Compensation for Nuclear Damage, which was organized by the Agency together with the Korea Atomic Energy Research Institute (KAERI), held in Seoul from 10 to 11 February 2011.

21. The Group also reviewed and endorsed a revised version of the draft Explanatory Text on the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention, and requested that it be published as part of the IAEA International Law Series with the same status as the Explanatory Texts for the 1997 Vienna Convention on Civil Liability for Nuclear Damage and for the CSC.

D. Nuclear installation safety

22. The International Seismic Safety Centre (ISSC) issued a note verbale in 2010 inviting Member States to participate in an extrabudgetary project to promote installation safety in NPPs, starting from the process of site selection and continuing all the way throughout the lifetime of the plant. Institutions from 37 Member States and three inter-governmental institutions — namely, the OECD/NEA and the two sites of the EC's Joint Research Council (JRC)'s Institute for Energy at Ispra, Italy, and Petten, the Netherlands — have become involved in the project's activities. A meeting was held in

January 2011 at which a three-year work plan was discussed and approved. The work plan addresses ten areas of work covering all aspects of external hazards and site-related safety issues for nuclear installations. The objective is to make available information that can be used to promote site and installation safety. In order to facilitate the processing of this safety information, the ISSC has developed a suite of review services that will provide Member States with assistance in every aspect of site selection and in the assessment of hazards during construction of the installation.[8]

23. Following on from the publication in 2008 of *Safety of Nuclear Fuel Cycle Facilities* (Safety Requirements Series No. NS-R-5), three Specific Safety Guides were published in 2010: *Safety of Conversion Facilities and Uranium Enrichment Facilities* (Specific Safety Guide No. SSG-5), *Safety of Uranium Fuel Fabrication Facilities* (Specific Safety Guide No. SSG-6), and *Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities* (Specific Safety Guide No. SSG-7). Work is continuing with a view to completing by 2013 further Safety Guides in this series to cover the remaining areas of the nuclear fuel cycle, including reprocessing facilities, storage of spent fuel, fuel cycle research and development facilities, and criticality safety.

24. Ever since the Fuel Incident Notification and Analysis System (FINAS) became operational as a web-based system in 2008, participation and event reporting have continued to improve. Since 2008, the number of Member States that have joined FINAS has increased by 50%. The 18 Member States currently participating in FINAS house approximately 80% of the fuel cycle facilities operating worldwide. The joint IAEA/NEA biennial meeting of the FINAS national coordinators was held in Vienna in October 2010. This meeting was an important forum for sharing information on safety related incidents at fuel cycle facilities and for discussing the operational status of FINAS. It also helped to improve the exchange of operating experience and the dissemination of the lessons learned from incidents and associated corrective actions to prevent the recurrence of such incidents.[9]

25. In June 2010, the Secretariat facilitated the creation of the Regulatory Cooperation Forum (RCF). This is a Member State-driven forum which brings together senior regulators from countries with advanced nuclear power programmes and representatives from those considering the expansion or introduction of nuclear power for the first time. It currently comprises 19 members. The primary objective of the RCF is to assist in the development of effectively independent and robust regulatory bodies for nuclear power through the coordination and exchange of regulatory knowledge and experience. The RCF provided regulatory support for the Jordan Nuclear Regulatory Commission in 2010. It also conducted its first annual plenary on the margins of that year's General Conference in order to share its activities with all interested Member States. Membership of the RCF is open to all Member States.[10]

E. Radiation safety

26. The Agency's Environmental Modelling for Radiation Safety Programme (EMRAS II), launched in 2009, builds upon the work of a series of similar projects that were started shortly after the 1986 Chernobyl accident. Its aim is to strengthen the capabilities of Member States in assessing and evaluating the radiological impact on humans and biota arising from radionuclides discharged into the

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[8] This relates to operative paragraph 26 of resolution GC(54)/RES/7.

[9] This relates to operative paragraph 28 of resolution GC(54)/RES/7.

[10] This relates to operative paragraph 7 of resolution GC(54)/RES/7.

environment. More than 140 scientists from 40 Member States attended Technical Meetings held in January 2010 and January 2011. The EMRAS II Programme focuses on the development, testing, and improvement of environmental transfer models for assessing exposures to the public and non-human species, and aims to stimulate the elaboration of internationally agreed and harmonized assessment methodologies.

27. The Agency's Database on Discharges of Radionuclides to the Atmosphere and Aquatic Environment (DIRATA) was further developed. In 2010, the Agency and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) agreed to establish a partnership to administer and maintain the DIRATA database jointly. The database is part of the activities which the Agency is undertaking in connection with UN General Assembly Resolution 51/189. UNSCEAR will use the data of discharges from installations associated with the nuclear fuel cycle to assess the resultant collective effective dose commitments for the local, regional and global population.

28. The Coordination Group on Radiation Protection of the Environment, which was established by the Agency's Plan of Activities on the Radiation Protection of the Environment, met in Vienna in September 2010 to continue its work on the development of the regulatory approaches that are applied in Member States, as well as to identify areas requiring further scientific work in order to improve the assessment of exposures to non-human species. The meeting was attended by representatives of international bodies such as the EC, the International Commission on Radiological Protection (ICRP), the NEA, UNSCEAR and the United Nations Environment Programme (UNEP), as well as by representatives of regulatory bodies and scientific institutions from 10 countries. The focus of the meeting was to discuss the views of international bodies on radiological protection of the environment. The meeting was an important step towards the implementation of the requirements regarding radiological protection of the environment as outlined in the revised BSS.[11]

29. The Agency continued fulfilling its advisory role with regard to the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (the London Convention), which, inter alia, covers radioactive materials. The Agency's work in developing methods for the assessment of the effects of radiation on the public and environment in an integrated and consistent manner should be emphasized in this respect. These methods are being considered for application within regulatory frameworks which allow exemption and clearance parameters for materials with low amounts of radioactivity and are expected to be submitted to the Consultative Meeting of Contracting Parties to the London Convention later in 2011.[12]

30. The Secretariat continued its cooperation with the Radioactive Substances Committee of the Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention). It supported the Committee in its task of developing a framework to analyse quality criteria and to elaborate ecological quality objectives for the prevention of pollution of the marine environment in accordance with the Convention. A final report on this work will be submitted to the Committee in 2011.[13]

31. Progress has been made in 2011 towards reaching the objectives of the International Action Plan for the Radiation Protection of Patients, as evinced by: the completion of educational training material also in different official languages; an increased number of downloads from the Radiation Protection of Patients (RPoP) website in 2011, including visits through social media platforms; the provision of

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[11] This relates to operative paragraph 29 of resolution GC(49)/RES/9.

[12] This relates to preambular paragraph (n) of resolution GC(54)/RES/7.

[13] This relates to preambular paragraph (j) of resolution GC(51)/RES/11.

radiation protection training for medical practitioners who use radiation in their work through training events in all regions in 2011; and the reinforcement of the role of diagnostic reference levels through the revision of the BSS, and of optimization strategies in medical applications to minimize any associated risk to the patient by eliminating unnecessary radiation exposure, as well as to avoid accidents and radiation injuries. The Agency also supported safety authorities in their efforts to prevent incidents in the medical use of radiation through Safety in Radiological Procedures (SAFRAD), a web-based voluntary reporting system for collecting, analysing and disseminating information on high exposure events in fluoroscopically guided interventional procedures, which was finalized for general release.[14] Furthermore, the Safety in Radiation Oncology (SAFRON) web-based voluntary reporting system for registering and learning from incidents and near-incidents in radiotherapy, which integrates retrospective reporting and prospective risk analysis, was completed as a prototype for further testing before general release.[15]

32. While the majority of Member States continued to take advantage of regional TC projects dealing with medical exposure to radiation, there is scope for further involvement and more active participation. Three new regional networks of specialized health professionals focusing on specific medical radiation protection issues were established in 2010: the Network of Gastroenterologists in Radiation Protection for Latin American Countries; the European Network on Radiation Protection of Children; and the Asian Network on Radiation Protection of Children. Information sharing was strengthened through further improvement of the Agency's dedicated RPoP website,[16] for instance by posting radiation protection information on social media websites such as Facebook and Twitter, making available more material in non-English languages, and providing more information for health professionals as well as patients.[17]

33. The Fifth Meeting of the Steering Committee of the Action Plan for Occupational Radiation Protection was held from 15 to 17 June 2011 at the Agency's Headquarters in Vienna. The Committee evaluated the results achieved since the last meeting and proposed to close the Action Plan as almost all the actions in the Action Plan have been completed. The Steering Committee also provided the Agency with recommendations on the new challenges for occupational radiation protection. As one of the results of the Action Plan, the Occupational Radiation Protection Networks (ORPNET) website was launched in October 2010.[18] It provides links to all regional As Low As Reasonably Achievable (ALARA) networks, as well as some other important systems for occupational radiation protection, and it will act as a focal point for the exchange of information in this field.

F. Transport safety

34. In response to requests from Member States, the Agency continues to be involved in informal discussions held between coastal and shipping States.[19] A meeting was held during the 54th session of the General Conference to emphasize the importance of maintaining dialogue and consultation aimed

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[14] http://rpop.iaea.org/safrad/

[15] This relates to operative paragraph 30 of resolution GC(54)/RES/7.

[16] http://rpop.iaea.org

[17] This relates to operative paragraph 31 of resolution GC(54)/RES/7.

[18] http://www-ns.iaea.org/tech-areas/communication-networks/norp/default.asp

[19] This relates to operative paragraph 36 of resolution GC(54)/RES/7.

at improving mutual understanding, confidence building and enhanced communication with regard to the safe maritime transport of radioactive material. The meeting included a discussion on the response to a simulated accident at sea and it was also concluded that all shipping and coastal States have the same concerns.

35. A draft proposal to work out how appropriate information can be made available to authorities responding to an emergency on board a ship carrying radioactive material was prepared by representatives from interested Member States and discussed at the TRANSSC meeting in Vienna in November 2010.[20] The Maritime Safety Committee of the International Maritime Organization (IMO) is involved in the preparation of this proposal. Work has been delayed as a result of two natural disasters directly affecting key participant States. However, virtual meetings with Member States to develop relevant materials for reporting to competent authorities were held in May, June and July 2011.

36. The Agency continues to review the scientific basis for its transport safety standards.[21] Two Technical Meetings were held to examine and collect the technical bases for the requirements in the Regulations for the Safe Transport of Radioactive Material (Transport Regulations). The aim of this review is to identify whether these requirements have a sufficiently strong technical basis or whether they need to be updated in line with recent changes in weather patterns, science and technology. In addition, the Agency is discussing with other relevant UN bodies and interested Member States how best to implement a project that would take into account scientific evidence of changes in global weather patterns, as well as developments in relevant infrastructures and the nuclear industry. With regard to the ongoing review of the Agency's transport safety standards, changes in industry related to an increase in decommissioning of NPPs and the need for more relevant controls on fissile material in waste have led to the development of new draft requirements for the transport of fissile-excepted radioactive material (i.e. radioactive material that is excepted from some or all of the requirements for the transport of fissile material). This draft has been reviewed by Member States and is due to be submitted to the Board of Governors in 2012.

37. Surveys have previously been conducted by the Agency on how Member States ensure that their regulatory documents conform to the current edition of the Agency's Transport Regulations. A further survey is currently under way.[22] After the current revision of the Transport Regulations has been completed, the Agency will initiate an extended campaign of dissemination and implementation.

38. Progress has been made over the past year with the implementation of the Action Plan of the International Steering Committee on Denials of Shipment of Radioactive Material in order to respond to denials of shipment.[23] Over 200 reports of instances of denial or delay of shipments have been entered into the appropriate database. These reports have been fully reviewed by competent experts, who have reported on strategic actions they consider important in combating such instances of denial and delay. A communication toolkit (containing, for example, checklists for communication plans) and a handbook to help Member States to avoid denials of shipment have been elaborated. All Member States now also have access to an e-learning package that was developed by the IMO, with support from the Agency. Various UN bodies continue to cooperate in this area. More than 70 Member States nominated National Focal Points to deal with the issue of denials of shipments. Several meetings have been convened to assist with the provision of the deliverables specified in the Action

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[20] This relates to operative paragraphs 37 and 38 of resolution GC(54)/RES/7.

[21] This relates to operative paragraph 40 of resolution GC(54)/RES/7.

[22] This relates to operative paragraph 33 of resolution GC(54)/RES/7.

[23] This relates to operative paragraph 42 of resolution GC(54)/RES/7.

Plan, culminating in the second round workshops of National Focal Points held in conjunction with the sixth Steering Committee meeting in April 2011. These meetings updated the action plans at the regional and global levels in the light of the target set by the Secretariat of minimizing the number of denials of shipment, with the aim of eliminating them by the 2013 General Conference. Reports showed significant improvements in the response networks in Asia and Latin America which deal with requests to facilitate the transport of radioactive material.

39. The Agency, with support from its TC programme, has increased its training efforts related to the transport of radioactive material, including national and regional training courses which incorporate training package on compliance assurance, including information on denials of shipment.[24] Additional regional TC projects have been proposed for Europe, Asia and Africa, whilst a regional TC project on transport in Latin America has been extended. These projects include activities focused on identifying national strengths that can be used in the respective regions, with the goal of responding to the General Conference's request that more experts from the regions concerned be involved.

G. Safety of management of spent fuel and radioactive waste

40. At the time of the 54th session of the General Conference, there were 56 Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. By the end of the reporting period, four more States became Contracting Parties to the Joint Convention, bringing the total up to 60.[25]

41. As part of the Joint Convention's promotional activities, a workshop on the Joint Convention, bringing together 65 professionals from 10 Member States was held in Tokyo, Japan, from 28 to 30 September 2010, in parallel to the annual meeting of the Radioactive Waste Management Technical Group (RWMTG) of the Asian Nuclear Safety Network (ANSN). This workshop gave participants from non-Contracting Parties a broader understanding of the Joint Convention, informing them of the advantages of becoming a Contracting Party and discussing the lessons learnt in the Joint Convention review process. In addition, the workshop informed participants of the changes to the Agency's Net Enabled Waste Management Database (NEWMDB) for international reporting, which included a complete update of the user interface, the translation of the interface into all of the Agency's official languages, the provision of better search facilities and more context-based information, and updates to incorporate the new radioactive waste classification system outlined in *Classification of Radioactive Waste* (General Safety Guide No. GSG-1).[26]

42. An International Workshop on Sustainable Management of Disused Sealed Radioactive Sources took place in Lisbon from 11 to 15 October 2010. The workshop featured discussions on the creation of synergies between the review process of the Joint Convention and that of the Code of Conduct on the Safety and Security of Radioactive Sources. The workshop encouraged the Agency to continue facilitating the interaction between the Contracting Parties to the Joint Convention and the States

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[24] This relates to operative paragraph 43 of resolution GC(54)/RES/7.

[25] This relates to operative paragraph 45 of resolution GC(54)/RES/7.

[26] This relates to operative paragraph 46 of resolution GC(54)/RES/7.

participating in the review meetings on the Code of Conduct through the organization of joint meetings.[27]

43. As part of the continuing efforts of the Contracting Parties to the Joint Convention to enhance the transparency, efficiency and effectiveness of the review process, a meeting of the Contracting Parties was hosted by the French Nuclear Safety Authority (ASN) in Paris, France, on 10 June 2010. The meeting discussed recommendations for enhancing communication and promoting continuity between Joint Convention Review Meetings.

44. A meeting of the Joint Convention's General Committee took place in Vienna on 24 September 2010. The General Committee, chaired by the President of the Third Review Meeting of the Joint Convention, agreed in particular to issue a Joint Convention Newsletter as an outreach tool to promote the Joint Convention to all of the Agency's Member States. The first Joint Convention Newsletter was distributed to Member States in March 2011 and was uploaded to the Joint Convention's public website.[28]

45. The organizational meeting to prepare the Fourth Review Meeting of the Joint Convention took place in Vienna from 10 to 11 May 2011. During the organizational meeting, the officers for the Review Meeting were selected and its agenda was established.[29]

46. An open-ended meeting of technical and legal experts took place from 6 to 8 July 2011 at the Agency's Headquarters in Vienna to discuss the development of a non-binding instrument on the transboundary movement of scrap metal that may inadvertently contain radioactive material. The meeting was attended by 40 experts from 31 Member States and 5 observers. A key conclusion noted in the Chairman's Report is that the instrument should be developed as a 'Code of Conduct' so that it can be easily identified, but also understood to be non-binding, and so that it follows a well-established development process similar to other Codes of Conduct. The participants agreed on a schedule to develop the Code of Conduct, including a second open-ended meeting of technical and legal experts to be convened in late 2011 or early 2012. This meeting will be held with the goal of producing a final draft Code of Conduct.[30]

H. Safe decommissioning of nuclear facilities and other facilities using radioactive material

47. The Agency continued its work on the development and revision of safety standards and supporting documents related to decommissioning, in particular by addressing issues identified by Member States. These issues include decommissioning preparatory tasks to be performed during the transition phase between the operation and decommissioning of a nuclear facility. Revision of the decommissioning safety requirements has been initiated following the approval of the corresponding document preparation profile by the Commission on Safety Standards (CSS) in May 2011.[31] Revised

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[27] This relates to operative paragraph 46 of resolution GC(54)/RES/7.

[28] http://www-ns.iaea.org/conventions/waste-jointconvention.asp?s=6&l=40

[29] This relates to operative paragraph 47 of resolution GC(54)/RES/7.

[30] This relates to operative paragraph 48 of resolution GC(54)/RES/7.

[31] This relates to operative paragraph 22 of resolution GC(54)/RES/7.

Safety Guides addressing the decommissioning of different types of facilities will be submitted to the Safety Standards Committees for review in December 2011.

48. A new Safety Report, *Monitoring for Compliance with Exemption and Clearance Levels*, was approved for publication in December 2010 and is expected to be published by the end of 2011. Another Safety Report, *Monitoring for Compliance with Remediation Criteria for Sites*, is expected to be approved for publication later in 2011. The report *Safety Assessment Methodologies for Decommissioning of Facilities Using Radioactive Material*, which supplements *Safety Assessment for the Decommissioning of Facilities Using Radioactive Material* (Safety Guide No. WS-G-5.2, issued in 2008), was finalized in July 2011.

49. In 2010 and 2011, the Agency continued to assist Member States in establishing regulatory and technical frameworks for the safe decommissioning of nuclear activities and facilities, as well as for the timely planning of decommissioning and increasing the competencies of the staff involved in the preparation and implementation of decommissioning. More than twenty missions and training events have been organized since June 2010 to assess current plans and practices in Member States, to provide advice on how they might be improved, to transfer knowledge and experience from more advanced countries, and to promote the establishment of communication channels and direct knowledge transfer amongst countries facing similar decommissioning challenges.

50. Several new training events covering problematic issues, such as the transition from operation to decommissioning, advanced characterization and dose optimization techniques, management of large components, and emergency planning for decommissioning, have been organized. Member States with little or no experience in decommissioning received assistance through a number of TC projects dealing with nuclear safety. The projects included the drafting of preliminary (in the case of the Philippines and Slovenia) or detailed (China and Ukraine) decommissioning plans, and the implementation of decommissioning activities (Georgia and Iraq). The emphasis was on ensuring that the respective decommissioning plans and activities complied with the Agency's safety standards, as well as on providing guidance on practical implementation through technical reports on decommissioning. The design of several new national, regional and interregional projects dealing with decommissioning, to be implemented under the TC programme, was completed in June 2011. These include the interregional project 'Promoting Safe and Efficient Clean-up of Radioactively Contaminated Facilities and Sites'; and two European regional projects: 'Supporting Decommissioning Implementation for Facilities Using Radioactive Material' and 'Decommissioning and Waste Management for the Chernobyl NPP, the Ignalina NPP and the A1 NPP in the Slovak Republic'.

51. Within the International Decommissioning Network (IDN), considerable progress was made during 2010 and 2011 in implementing the three elements of training: hands-on training for decommissioning and dismantling; radiation protection training; and field internships.[32] The events supported by the IDN in 2010 and 2011 included a specialist meeting on the use of dose-planning software, which was held at Mol, Belgium, from 12 to 15 October 2010; a practical training course on the fundamentals of decommissioning and environmental remediation, which was held at the Argonne National Laboratory (ANL) in the USA from 4 to 15 April 2011; a scientific visit to the Chooz A NPP and the Aube Disposal Centre in France from 21 to 25 March 2011, which was intended for a small group of regulators and senior managers and focused specifically on the management of large components. The annual forum of the IDN took place in November 2010 in Vienna.

[32] This relates to operative paragraph 50 of resolution GC(54)/RES/7.

52. Significant progress has been made on the Iraq project for decommissioning former nuclear facilities in Iraq.[33] The activities that are well under way or completed include the cleanup of 65 000 m^2 of the Al Tuwaitha site near Baghdad, the decommissioning of the former Geo-pilot Plant used to produce kilogram quantities of hydrated yellowcake, and the decommissioning of the LAMA facility and the Radioisotope Production Laboratory. These activities provided valuable lessons and confirmed the appropriateness of the decision to prioritize the more lightly contaminated facilities for early decommissioning. Planning has begun for the decommissioning of five new facilities or sites, including the IRT 5000 and Tammuz 2 research reactors for Phase 2 of the project (2011–2015). Fellowships, site visits and training courses focusing on decommissioning, dose assessment, safety assessments, waste management, database management, and clearance of materials have been organized to enhance the knowledge of Iraqi staff in the areas of decommissioning, waste management and radioanalytical laboratory techniques. Experts reviewed the draft of an overarching decommissioning plan for the project in May 2011. A national policy and strategy for waste management was drafted in November 2009, and the Agency continues to provide expert advice on improving waste management activities in Iraq. The development of site-specific decommissioning plans and safety assessments will start in November 2011 as part of this project. The design of new national projects dealing with decommissioning and waste management, to be implemented under the TC programme, was completed in June 2011.

I. Safety in uranium mining and processing and remediation of contaminated sites

53. The First Technical Meeting of the International Working Forum on Regulatory Supervision of Legacy Sites (RSLS) was held in Vienna from 11 to 15 October 2010.[34] The meeting was attended by 28 representatives from the regulatory bodies of 14 Member States.

54. The objectives of the meeting were to provide an initial opportunity for the exchange of ideas among relevant regulatory organizations with regard to the particular regulatory needs that apply to the supervision of legacy sites, and to develop a work plan of activities that will address these needs over the next three years. Working groups were formed to address the following three areas: enhancement of the regulatory regime, the professional development of regulators, and the application of specific methods for safety and environmental assessments. The meeting also served as an opportunity to establish a network and points of contact for future regulatory interactions.

55. A draft three-year work plan was developed at a consultancy meeting held in Drammen, Norway, from 18 to 20 April 2011, which brought together representatives from Australia, Norway, the Russian Federation and the USA. The work plan will be finalized at the next annual Technical Meeting of the RSLS. The Forum provides support to regulators addressing legacy site issues by promoting the exchange of ideas, information and methods.

56. The Agency and the international community continued to work together in the development of a coordinated approach towards the remediation of uranium production legacy sites in Central Asia in accordance with international standards, recommendations and practice. Two TC projects, ‘Supporting Preparation for Remediation of Uranium Production Legacy Sites’ (RER/3/010) and ‘Enhancing

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[33] This relates to operative paragraph 51 of resolution GC(54)/RES/7.

[34] This relates to operative paragraph 54 of resolution GC(54)/RES/7.

Radio-Ecological Monitoring' (KIG/7/002) are currently being implemented. These projects comprise workshops, training courses and expert missions covering radiological monitoring, risk and safety assessment methodologies, laboratory proficiency, and regulatory process enhancement.[35]

57. Following on from the technical baseline document *Assessment and Proposals for Uranium Production Legacy Sites in Central Asia: An International Approach*, which was developed jointly by the Agency and the EC's EuropeAid Co-operation Office (AIDCO), two terms of reference (ToRs) for environmental impact assessments were prepared for sites in Uzbekistan. These documents address the problem of uranium legacy waste from an exposure pathway perspective and complement the objective of mitigating the health and environmental hazards presented by the legacy sites in question. The EC has announced that it will create and fund projects based on these ToRs in 2012. Furthermore, on the basis of the recommendations provided in the IAEA/AIDCO document, the EC will fund the development of a regional watershed monitoring network as of 2012. This network will monitor surface water from rivers and their catchment areas, and will warn the users of these waters of potential problems arising from contamination.[36]

58. Several international organizations are also active in Central Asia. Projects addressing the issue of legacy sites were carried out by the World Bank at Mailuu-Suu in Kyrgyzstan, with the support of the Agency, which provided an expert to review a water monitoring programme and participate in a joint mission to the site. The mission took place from 21 to 25 February 2011 and the review led to the optimization of the water monitoring programme for the Mailuu-Suu site. The United Nations Development Programme (UNDP) is developing a portfolio of remediation projects for uranium production legacy sites, and the Agency has provided background information to support this initiative. The Agency has been working closely with these organizations to find opportunities to optimize resources and complement each other's activities in such a way as to maximize support to Member States in Central Asia.

J. Education and training in nuclear, radiation, transport and waste safety

59. An increasing number of Member States are considering or launching new nuclear power generation programmes. The Agency's role in developing sustainable training options has therefore become more important. Ongoing initiatives in the form of basic professional courses offering training in the Agency's safety standards, specialized topical courses, video lectures, web-based multimedia training, and guidelines for self-assessment of competency needs, are continually being reviewed, modified, and expanded so as to assist Member States in their training and competency building efforts. Nuclear safety specialist teams were deployed in the design, planning, and delivery of important technical training programmes in all aspects of nuclear safety at national and regional levels.

60. The Agency has developed a strategy for its activities related to the provision of nuclear safety education and training to Member States. A methodology was elaborated for identifying knowledge gaps based on competency frameworks. Extensive multimedia educational and training material based on the Agency's safety standards has been developed and made available to Member States.

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[35] This relates to operative paragraph 52 of resolution GC(54)/RES/7.

[36] This relates to operative paragraph 54 of resolution GC(54)/RES/7.

Documents, lectures and other material pertinent to nuclear installation safety education and training can be obtained directly from the Agency's website.

61. Comprehensive safety competence frameworks for identifying training needs are available, and continuous efforts are being made to develop relevant training materials and syllabuses. The Agency also offers seminars for training managers that focus on the way that they can use the Agency's training materials and publications to design tailored programmes that fulfil the specific needs of individual Member States. Practical training is provided through fellowships.

62. Assistance to Member States in most regions has been provided to enable them to assess their training needs, to identify gaps in their knowledge, to design safety related training programmes, and to implement training using the relevant material prepared and made available by the Agency to Member States.

63. The Agency has developed a set of Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN). These guidelines constitute a revised version of *Training the Staff of the Regulatory Body for Nuclear Facilities: A Competency Framework* (IAEA-TECDOC-1254, issued in 2001). They explain the process of systematic training needs assessment and include questionnaires for the self-assessment of competence needs, covering around 200 competencies under a four-quadrant framework. The Agency has also developed software to facilitate implementation of the SARCoN guidelines and provided assistance in using the software to Bangladesh, Belarus, China, Morocco, Nigeria and Yemen. An open seminar on how to use SARCoN software is scheduled to take place in Vienna in December 2011.

64. The Education and Training Topical Group (ETTG) of the Asian Nuclear Safety Network (ANSN) developed, under the guidance of the Agency, a General Competencies Framework (GCF) covering over 100 competencies based on SARCoN in the area of nuclear safety. The GCF identified different levels of knowledge and target audiences, including regulators, operators, technical support organizations and the general public. The ETTG then populated each of the areas of the GCF with training material and courses available in the Asian countries and placed them on their web-based platform for sharing among all ANSN countries. The ETTG countries also conducted systematic assessments of training needs by analysing gaps in competencies with reference to the GCF. After deciding which parts of the GCF were relevant to their national situation and future plans, they then drew up National Training Frameworks to be used as a basis for planning, training and prioritizing external assistance. Finally, the ETTG members shared their experience and knowledge with one another, as well as all the training materials from the Agency courses held in the participating countries.

65. The Agency finalized an Education and Training Peer Review Service, drawing up a final draft of guidelines for this service and scheduling a pilot mission to the countries of the ANSN.

66. An international training course on safety infrastructure development, based on *Establishing the Safety Infrastructure for a Nuclear Power Programme* (Specific Safety Guide No. SSG-16), was held at the Argonne National Laboratory (ANL) in the USA in November 2010. Training packages on safety infrastructure for Member States embarking on nuclear power programmes were produced, and the comprehensive information was posted on the Agency's website.

67. The Basic Professional Training Course (BPTC) was revised. Basic Professional Training Courses and Regulatory Control Courses, which are both, available as e-books, were held in the Asia and Latin America regions. Such courses were also organized in Bangladesh, Nigeria, and Syria. The BPTC for the Latin America region was extended to include computer based simulator training.

68. New video lectures based on existing training courses and workshops were produced in 2010 covering the areas of plant siting, safety culture, deterministic and probabilistic safety assessment, inspection, safety infrastructure development, communication of nuclear issues to the public and regulatory experience in the construction of NPPs. Some of the video lectures have been posted on the Agency's website and others are made available as DVDs upon request. Newsletters were issued giving information on the new training materials and resources that are available, and video presentations with slides were posted on the Agency's website. A 'train the trainers' seminar for the Asia region was held at the Korean International Nuclear School in September 2010 in order to help trainers develop their own effective training programmes using Agency materials and resources.

69. Activities to assist Member States in building competencies necessary for the use and application of advanced safety analysis tools were conducted under the framework of the Safety Assessment Education and Training (SAET) Programme. They included the development of essential knowledge syllabuses and training modules, and the delivery of lectures and workshops on probabilistic and deterministic safety assessment, integrated risk-informed decision making, and engineering aspects important to safety. In order to expand online training in nuclear safety assessment, pilot web seminars were launched on the Internet so that large number of operating and regulatory staff can benefit from this type of training.

70. Extrabudgetary funding provided by the EC, Norway and the USA enhanced the Agency's capacity to deliver sustainable nuclear safety training to selected Member States and to achieve higher levels of efficiency in developing methodologies and tools for capacity building. Projects were conducted in the fields of safety culture, regulatory inspection, safety assessment, integrated safety management and emergency preparedness for the Bulgarian, Iranian and Romanian nuclear regulatory authorities. Experience-based training through placements in regulatory bodies and on-the-job mentoring for new inspection and safety assessment regulatory personnel were used extensively, and further plans to apply these methods and to use non-active NPP facilities for hands-on training of nuclear safety professionals were developed.[37]

71. The Steering Committee on Education and Training in Radiation Protection and Waste Safety met from 29 November to 3 December 2010, and provided the Secretariat with comments and advice on the implementation of the *Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020* (reproduced in Note by the Secretariat 2010/Note 44).[38] The suggestions made by the Steering Committee covered areas such as the establishment of milestones and performance indicators to monitor progress in the implementation of safety strategies, the revision of course syllabuses, and ways in which networking might be strengthened.

72. The Post Graduate Educational Course (PGEC) in Radiation Protection and the Safety of Radiation Sources (which has a nominal duration of six months and includes a 'train the trainers' module) has continued to provide a pool of future experts in radiation protection, and was offered in Argentina (with classes held in Spanish), Malaysia (English), Morocco (French) and Syria (Arabic).

73. The Agency also organized a number of short-term training events on a range of topics, such as authorization and inspection of radiation sources (Ethiopia, October 2010), and introduction to radioprotection principles and radiation safety (Niger, October 2010). The full list of training events, including those already mentioned, is available on the Agency's website.[39]

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[37] This relates to operative paragraph 56 of resolution GC(54)/RES/7.

[38] This relates to operative paragraph 58 of resolution GC(54)/RES/7.

[39] http://www-ns.iaea.org/training/calendar.asp?s=9&l=73

74. The syllabus for the PGEC in Radiation Protection and the Safety of Radiation Sources was revised to take account of *The 2007 Recommendations of the International Commission on Radiological Protection* (ICRP Publication 103), as well as of the forthcoming revised BSS**,** to be published in Part 3 of the IAEA General Safety Requirements Series. The draft syllabus was reviewed and revised at a meeting of the PGEC directors from 11 to 15 April 2011. This meeting also provided an excellent networking opportunity that was used to harmonize implementation of the PGEC and to share best practices among the regional training centres that host the PGEC on a regular basis. A revised syllabus for training radiation protection officers (RPOs) was also submitted to the participants in the meeting for their review.

75. Recognizing that 'train the trainers' workshops are an important contribution to the future self-sufficiency of education and training activities in Member States, a 'train the trainers' module was incorporated into the syllabus of the PGEC in Radiation Protection and the Safety of Radiation Sources, and a dedicated workshop of this kind for RPOs was held in Lithuania from 9 to 13 May 2011.

76. The education and training module of the Agency's web-based Radiation Safety Information Management System (RASIMS) has been restructured to reflect the 2011–2020 strategic approach for building competence through education and training at the national level. This will provide feedback to each Member State and to the Secretariat regarding the development of national strategies for education and training.

77. New TC projects to strengthen education and training during the 2012–2013 cycle have been designed, and they include activities to assist Member States in developing national strategies based on identified needs and to support participation in PGECs, 'train the trainers' events, and workshops for RPOs.

78. Education and Training Appraisal (EduTA) missions[40] proved to be of great interest to Member States, and such missions were carried out in Algeria, Belarus, Egypt, the Republic of Korea and Morocco. The main purpose of each mission was to carry out a detailed appraisal of the status of that country's provision of education and training in radiation protection, including, inter alia, the associated legislative and regulatory framework, national training programmes for radiation safety, the availability of training course providers and training courses. The successful outcome of an EduTA mission is a prerequisite for a long-term agreement on education and training in radiation protection and nuclear safety between the Agency and the Member State.

79. A long-term Agreement was signed with Greece. Requests for long-term agreements[41] have been received from Brazil, Malaysia, and Morocco.

80. From 5 September to 15 October 2010, the Agency organized, in collaboration with the Clausthal University of Technology, an International Training Course on Management of Radioactive Waste based on the IAEA Safety Standards and International Best Practice at Clausthal-Zellerfeld, Germany. The programme covered predisposal, disposal, and decommissioning, as well as remediation and mining and milling waste, and was complemented by field trips to various decommissioning and disposal facility sites. This training course was attended by 13 participants from six Member States. A second training course is due to take place from 5 September to 14 October 2011.

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[40] This relates to operative paragraph 59 of resolution GC(54)/RES/7.

[41] This relates to operative paragraph 60 of resolution GC(54)/RES/7.

K. Safety and security of radioactive sources

81. In its continuous efforts to recover and maintain control of vulnerable and orphan sources,[42] the Agency has finalized the Safety Guide *National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources*, which was approved by the Commission on Safety Standards (CSS) in October 2010. The Agency has also finalized the associated training package and used it in one regional training course for Northern African States and in one national training course for Pakistan.

82. As of 30 June 2011, governments of 103 States have made a commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources, of which 64 have also notified the Director General of their intention to act in a harmonized manner in accordance with the Code of Conduct's supplementary Guidance on the Import and Export of Radioactive Sources. A total of 110 States have nominated points of contact for the purpose of facilitating the export and import of radioactive sources and have provided the relevant details to the Agency. A workshop for States whose governments have not yet made a commitment was held from 11 to 13 July 2011, with a view to explaining the Code of Conduct, as well as to demonstrate the advantages of expressing such a commitment.[43]

83. To facilitate States' implementation of the Guidance on the Import and Export of Radioactive Sources,[44] as well as to carry out the recommendations of 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, which was held in Vienna in May 2010,[45] the Agency has initiated a review process for the Guidance. A consultancy meeting held in January 2011 drafted a revised version of the Guidance and accompanying documents to improve the clarity of the provisions and to facilitate their harmonized implementation. The Agency circulated those drafts to all Member States asking them to submit comments and organized a further open-ended meeting of technical and legal experts in Vienna from 30 May to 1 June 2011. This meeting was attended by 155 experts from 82 Member States and three international organizations. The objective of the meeting was to discuss the proposed draft of the revised Guidance and to agree on a final version. The meeting reached a consensus on the draft of the revised Guidance. This revised Guidance is submitted in document GOV/2011/44-GC(55)/11 for the approval of the Board and the endorsement of the General Conference.

84. 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 in May 2010, regional workshops are planned to foster the exchange of information on the implementation of the Code of Conduct and its supplementary Guidance in Latin America and Africa.

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[42] This relates to operative paragraph 61 of resolution GC(54)/RES/7.

[43] This relates to operative paragraph 62 of resolution GC(54)/RES/7.

[44] This relates to operative paragraph 63 of resolution GC(54)/RES/7.

[45] This relates to operative paragraphs 65 and 66 of resolution GC(54)/RES/7.

L. Preparedness and response for nuclear and radiological incidents and emergencies

85. The Convention on Early Notification of a Nuclear Accident (Early Notification Convention) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Assistance Convention) have established an international framework to facilitate the exchange of information and the prompt provision of assistance in case of a nuclear or radiological emergency upon request. Currently, 110 States and four international organizations are Parties to the Early Notification Convention, and 105 States and four international organizations are Parties to the Assistance Convention.[46]

86. To maintain the competencies of the radiation safety specialists who provide an on-call service to support the work of the Incident and Emergency Centre (IEC), a programme of tabletop exercises with imaginary scenarios was initiated in 2010. The exercises dealt with such scenarios as the recovery of a high activity sealed source, including the assessment of doses received by exposed individuals, and the initial response phase following an environmental release of radioactivity from a nuclear facility.[47]

87. The IEC conducted two Emergency Notification and Assistance Technical Operations Manual (ENATOM) workshops in 2010. These workshops were designed to improve communication between counterparts from Member States and the IEC in accordance with ENATOM. Participants had the opportunity to familiarize themselves with the communication procedures described in ENATOM, in particular with the correct forms to be used in communicating with the Agency on nuclear or radiological emergencies, as well as to gain insight into various aspects of assistance, and learn more about the Response and Assistance Network (RANET) and the ConvEx exercise regime. The first workshop was held from 20 to 22 September 2010 in Pretoria, South Africa, for participants from African States. The second workshop was held in Vienna from 27 to 29 October 2010 for 10 Member States from the Asia and Latin America regions.

88. The Joint Radiation Emergency Management Plan of the International Organizations constitutes the inter-agency framework for preparedness for, and response to, nuclear or radiological incidents and emergencies. In 2010, the Secretariat published the fifth edition of the Joint Plan (EPR-JPLAN (2010)). This publication updated the roles and responsibilities of the 13 sponsoring international organizations and the coordination of international activities in response to a nuclear or radiological emergency.[48]

89. The IEC conducted routine exercises with its counterparts in Member States and international organizations. For the ConvEx 1a-type exercise, participation increased by 13% in 2010. However, participation in the ConvEx 2b-type exercise was lower in 2010 than in the previous year. ConvEx-1a type exercises test the emergency communication channels (facsimile and telephone) and the access of the counterparts to the IAEA web based emergency communication system. ConvEx-2b type exercises test the capacity of counterparts to send adequate information to IAEA and the international community in a timely way in case of a nuclear or radiological emergency. The communication forms to be used and the target time frames for the expected communications are described in the Agency's Emergency Notification and Assistance Technical Operations Manual (ENATOM), which is distributed to all counterparts. A number of Member States informed the Secretariat that they had

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[46] This relates to operative paragraph 67 of resolution GC(54)/RES/7.

[47] This relates to operative paragraph 75 of resolution GC(54)/RES/7.

[48] This relates to operative paragraph 68 of resolution GC(54)/RES/7.

carried out a national exercise. In several cases, IEC staff were invited to observe these exercises and offer feedback regarding strengths and weaknesses in the response systems.

90. In mid-2010, the Secretariat invited all Member States and States Parties to either or both of the Conventions to consider offering to host the ConvEx 3 exercise in 2012.[49]

91. The Secretariat continued to collaborate with Member States on working towards streamlining RANET. A new edition of the RANET publication was issued (EPR-RANET (2010)). It takes into account common and harmonized guidelines and includes changes in the concept of the network. On the basis of past experience, the functional areas of assistance were restructured to facilitate easier registration, and the duties of the assistance team leader were outlined in detail. Mechanisms for the timely allocation of resources for international assistance are still under consideration.[50]

92. In 2010, three Member States registered their national assistance capabilities in RANET for the first time: Austria, Japan and the Russian Federation. This raised the total number of RANET-registered Member States to 19. Even though regional cooperation through RANET has grown, a greater commitment from Member States is strongly encouraged.[51]

93. The final report on the International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies was completed in 2010. The Action Plan process resulted in the identification of a number of important activities in the areas of emergency communications, international assistance and infrastructure that need to be addressed by Member States, stakeholders and the Secretariat in order to ensure the implementation and long term sustainability of the international emergency preparedness and response system. The final report marks a significant step forward and provides a strategy aimed at improving the flow and security of data exchanged between the Secretariat, Member States and international organizations.[52]

94. The Secretariat has continued with the development of the Unified System for Information Exchange in Incidents and Emergencies (USIE). This will replace the Agency's Early Notification and Assistance Conventions (ENAC) website and Nuclear Events Web-based System (NEWS). In 2010, trial versions of the new system were made available for review by a limited group of users at the level of national authorities. The USIE became fully operational as of 29 June 2011.[53]

95. In 2010, the year of the 20th anniversary of the International Nuclear and Radiological Event Scale (INES), Member States confirmed their support for INES. Moreover, the Agency's General Conference resolution GC(54)/RES/7 explicitly urged Member States "to designate INES national officers and utilize the scale". INES membership has increased from 31 countries initially to 70 countries at present.

96. During the Biennial Technical Meeting of the INES National Officers in October 2010, discussions were held as to how to further enhance the use of INES as the worldwide scale for communicating nuclear and radiological events. Over 60 participants, including INES national officers, international organizations, and public information officers, attended the meeting.

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[49] This relates to operative paragraph 69 of resolution GC(54)/RES/7.

[50] This relates to operative paragraph 70 of resolution GC(54)/RES/7.

[51] This relates to operative paragraph 71 of resolution GC(54)/RES/7.

[52] This relates to operative paragraph 72 of resolution GC(54)/RES/7.

[53] This relates to operative paragraph 73 of resolution GC(54)/RES/7.

97. The Secretariat has organized several informative seminars to communicate the INES methodology to Member States. A mini workshop was conducted during the Biennial Technical Meeting of the INES National Officers, and a national workshop was organized in Brazil which attracted over 75 participants. Several Member States have organized national training workshops on INES and translated the INES leaflet into various languages, thus enhancing the use of the scale in its areas of application. The Agency has also developed support material to assist with the use of the scale as a communication tool. In 2010, the INES User's Manual was issued in Spanish and Russian.[54]

98. The Secretariat continued to improve the Incident and Emergency System (IES), and its event response processes, timeliness, and equipment. For example, the 24/7 team of on-call specialists was expanded to include an external event specialist from the Agency's International Seismic Safety Centre (ISSC), who receives information on the occurrences of significant earthquakes and relays this information to the Emergency Response Manager for consideration and action. Other measures to improve efficiency include the establishment of a fully operational callout system that shortens the IES activation time during out-of-office periods by one hour. Equipment improvements include an upgrade of the IEC's video conferencing capabilities to host and record multipoint conferences using different videoconferencing protocols, as well as the introduction of new radiation monitoring devices for field missions.[55]

99. The Secretariat organized 38 training events, including workshops and courses on various aspects of emergency preparedness and response. A number of Member States demonstrated significant dedication to improving and sustaining their preparedness and response programmes by making use of the Agency's Emergency Preparedness Review (EPREV) missions (Azerbaijan, Belarus, the Philippines, Qatar, Romania and Thailand). The IEC also conducted 13 missions to assist Member States in developing and strengthening various aspects of their national emergency preparedness and response systems. These missions covered topics such as accident reporting, capacity building, and the observance of national exercises.

100. Four quarterly Information Bulletins were issued to provide the competent authorities in Member States with updated news on IEC activities and publications. The Bulletins contained information on exercises, training courses and workshops, event response and international assistance, and event reporting. The Bulletin also serves as a forum in which Member States can share news.[56]

M. The accident at the Fukushima Daiichi nuclear power plant

101. The Agency responded to the accident at the Fukushima Daiichi nuclear power plant by carrying out a number of activities centred on providing Member States with information on the accident and assisting the Japanese Government in its response. Routine briefings to the Member States were made covering primarily the status of the affected plants, including the spent fuel pools, and the radiological consequences of the accident. The Agency prepared its briefings using information provided by the Japanese Government through the Agency's Incident Emergency Centre (IEC), which was staffed 24 hours a day, 7 days a week up to 3 May 2011. The Agency was also in contact with other Member States that were assisting the Japanese Government in its response to the accident in order to gather as

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[54] This relates to operative paragraph 74 of resolution GC(54)/RES/7.

[55] This relates to operative paragraph 75 of resolution GC(54)/RES/7.

[56] This relates to operative paragraph 76 of resolution GC(54)/RES/7.

much information as possible. The Agency assembled a Fukushima Accident Coordination Team (FACT) to internally manage the flow of information and to coordinate this information in a manner that would be helpful for the briefings to Member States.

102. The Agency also sent a number of technical missions to Japan at the request of the Japanese Government. A report by the Director General, *IAEA Activities in Response to the Fukushima Accident* (GOV/INF/2011/8), which details these activities and missions, was submitted to the Board of Governors in June 2011.

103. With the agreement of the Japanese Government, the Agency conducted a preliminary mission to establish the facts and identify initial lessons to be learned from the accident at the Fukushima Daiichi NPP, and to share this information with the global nuclear community. This fact-finding mission was carried out by a team of nuclear experts from the Agency and Member States from 24 May to 2 June 2011.

104. During their mission, the team of nuclear experts met with excellent cooperation from all parties concerned, receiving information from many relevant Japanese ministries, nuclear regulators and operators. The team also visited the sites of the three affected NPPs — Fukushima Daiichi, Fukushima Daini and Tokai Daini — in order to try to assess the situation in the plants and the scale of the damage. In the course of these visits, the team were also able to talk to the operating personnel, as well as to view the ongoing restoration and remediation work.

105. The mission gathered evidence, undertook a preliminary assessment and developed preliminary conclusions and lessons to be learned. These preliminary conclusions and lessons have been shared and discussed with Japanese experts and officials. They fall broadly under the three areas of external hazards, severe accident management, and emergency preparedness.

106. The mission report, *IAEA International Fact Finding Expert Mission of the Fukushima Daiichi NPP Accident Following the Great East Japan Earthquake and Tsunami*, described the activities of the team of experts and presented 15 conclusions and 16 lessons, which are of relevance to the Japanese nuclear community, the Agency and the global nuclear community, and will serve to identify ways of improving nuclear safety worldwide following the accident. This report, which was posted on GOVATOM, was presented to Member States at the Ministerial Conference on Nuclear Safety convened by the Agency in June 2011, and it is also available on the Agency's website.

107. A Ministerial Declaration outlining a number of measures to improve nuclear safety and containing a firm commitment by the Agency's Member States to ensure that these measures were actually implemented was agreed upon at the Ministerial Conference. The Declaration called for a number of improvements to global nuclear safety, while stressing the need to receive from Japan and the Agency a comprehensive and fully transparent assessment of the accident at the Fukushima Daiichi NPP so as to be able to act upon the lessons learned, including a review of the Agency's relevant safety standards, in particular those pertaining to multiple severe hazards. It also underlined the benefits of strengthened and high quality independent international safety expert assessments. The Ministers expressed their commitment to strengthening the Agency's central role in promoting international efforts to strengthen global nuclear safety.

108. The Ministerial Conference consisted of plenary sessions and three working groups dealing with the following agendas: (a) "Preliminary Assessment of the Accident at TEPCO's Fukushima Nuclear Power Stations and Actions for Safety Improvements"; (b) "Emergency Preparedness and Response"; (c) "The Global Nuclear Safety Framework". Summaries of all the sessions were prepared by the session Chairs and presented to the participants during the closing plenary session.

109. The output from the Ministerial Conference provided valuable guidance for the preparation of the draft Action Plan, which will be before the Board of Governors and the General Conference in September 2011.