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Measures to strengthen international cooperation in nuclear, radiation and transport safety and waste management

Report by the Director General

Summary

Pursuant to resolution GC(50)/RES/10, a report including the following subjects is submitted to the Board of Governors and the General Conference for their consideration:

- regulatory reviews and networking for safety;
- the Agency's safety standards programme;
- education and training in nuclear, radiation, transport and waste safety;
- nuclear and radiological emergency preparedness and response;
- nuclear installation safety;
- radiation safety;
- safety and security of radioactive sources;
- transport safety;
- the safety of radioactive waste management;
- the safe decommissioning of nuclear facilities and other facilities using radioactive material.

Additional information on international conferences and on education and training is available on the Agency's GovAtom website as a Note by the Secretariat (document 2007/Note 36).

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 and transport safety and waste management

Report by the Director General

A. Regulatory reviews and networking for safety

A.1. Integrated Regulatory Review Service

1. The legal and governmental infrastructure related peer review services offered by the Agency are aimed at providing, on request, advice and assistance to Member States in strengthening and enhancing the effectiveness of their regulatory infrastructure. The Agency's Integrated Regulatory Review Service (IRRS), with its modular approach, is contributing towards a more active exchange of knowledge among senior regulators and harmonized regulatory approaches worldwide. The integration of regulatory self-assessment as part of the IRRS, through appropriate guidelines, methodologies and training, will continue to provide support to Member States for assessing the suitability and effectiveness of their processes in achieving regulatory goals and objectives.

2. The Agency conducted the first full scope IRRS in France in November 2006 covering all regulated nuclear and radiation facilities, activities and practices, including nuclear power plants, research reactors, fuel cycle facilities, medical practices, industrial and research activities, waste facilities, decommissioning, remediation and transport. In addition to the standard IRRS scope, the French Nuclear Safety Authority (ASN) requested that the mission also cover public information practices. The IRRS team carried out the review of the ASN regulatory framework and functions in all relevant areas: legislative and governmental responsibilities; authority, responsibilities and functions of the regulatory body; organization of the regulatory body; the authorization process; review and assessment; inspection and enforcement; the development of regulations and guides; emergency preparedness; radioactive waste management; the management system; transport[1]; and public information.

3. In March 2007, the Government of France, with support from the Agency, organized a workshop in Paris to discuss France's IRRS experience, identify lessons learned and provide an opportunity for other Member States to learn more about the IRRS process. Lessons learned and experience gained from IRRS missions to Romania and the United Kingdom (first phase) were also discussed. More than 100 participants — including senior managers and experts from regulatory bodies — from more than 30 Member States attended the workshop. The IRRS was considered as having provided a valuable

[1] A follow-up to the Agency's Transport Safety Appraisal Service (TranSAS) mission to France in 2004.

contribution to improving the effectiveness of nuclear safety regulation, and an opportunity for sharing regulatory experiences and lessons learned among senior regulators.

4. Participants from regulatory bodies, particularly those that will soon receive an IRRS mission, took advantage of the experience gained by their counterparts. Several areas for improvements were identified concerning the preparation and the development of IRRS missions. To facilitate future IRRS missions, the establishment of a network of experts from different countries to enhance international cooperation and share regulatory experiences was suggested and is being considered.

5. In order to continue the experience-sharing among senior regulators, the Spanish Nuclear Safety Council has offered to organize a follow up workshop in late 2008 or early 2009 to summarize the experience gained from IRRS missions conducted in 2007 and 2008.

6. The Agency conducted IRRS missions to Australia and Japan in June 2007. The mission to Japan, at the request of the Japanese authorities, reviewed the regulation of nuclear safety at nuclear power plants and also covered public information practices.

7. Missions are also scheduled for Mexico and Pakistan during 2007. The Agency has received requests for IRRS missions from Canada, Germany, Spain and the UK (second phase).

A.2. Networking for nuclear and radiation safety

A.2.1. Global nuclear and radiation safety network

8. Networking in connection with nuclear and radiation safety knowledge is a cornerstone of the global nuclear safety regime. There are a number of regional safety networks in operation and the Agency provides support and guidance to many of these networks. The intention in the long term is to take advantage of the synergies among existing and new networks and to establish a sustainable global nuclear safety network. In addition to the networks discussed below, other safety networks are discussed in the relevant sections of this report.

A.2.2. Asian Nuclear Safety Network (ANSN)

9. In 2007, significant improvements were made to the network (including adding more than 1000 thematic presentations related to nuclear safety) and user access. Currently, access to the ANSN requires registration through one of the network hubs or national centres, and access to a topical group requires registration through the group's coordinator. Work is under way to allow a more open access to parts of the network.

10. The ANSN is also being increasingly used as an on-line tool for sharing experience in the implementation of safety improvements. In March 2007, the guidelines for integrated safety evaluation were revised and guidance for self-assessment was improved, as a result of a meeting of participating Member States held in Vienna under the auspices of the Agency. Evaluation is essential to recognize achievements, to improve nuclear safety and to focus future assistance in the areas of greater need.

11. The ANSN steering committee met in Beijing in June 2007 and concluded that substantial improvements were taking place in the ANSN with respect to both its format and content. Reports by the coordinators of each of the topical groups dealing with specific nuclear safety areas indicated that the work planned for 2007 was well underway. The establishment of a new topical group on safety management of research reactors was welcomed.

A.2.3. Ibero-American Radiation Safety Network

12. The Ibero-American Radiation Safety Network was developed in the framework of an Agency extrabudgetary programme operated under the auspices of the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies. The 2007 Plenary Meeting of the Forum was held in Mexico in July 2007, with the participation of Argentina, Brazil, Cuba, Mexico, Spain and Uruguay. At that meeting, the activities for the following year were agreed. It was also agreed that the Ibero-American Radiation Safety Network would be hosted and operated by Brazil. Uruguay has assumed the presidency of the Forum for 2007/2008. In 2007, version 1.0 of the Network became fully operational and safety related knowledge relevant to nuclear regulators is being shared among participating countries. Spain is providing financial support for the Spanish translation of IAEA Safety Guides that will be shared in the network.

13. Two network projects on safety and regulatory control in radiotherapy are under implementation. The first is based on the Agency's previous work on probabilistic safety assessment (PSA) for cobalt-60 external beam and high-dose rate brachytherapy and this project has extended the method to radiotherapy treatments with linear accelerators. In 2007, the analysis of the effect of various modes of failure was completed and event sequences leading to potential consequences were developed for selected initiating events. This project will be finished by November 2007.

14. The second project consists of using operational experience gained through lessons from accidental exposure and from the results of PSA to provide safety recommendations for radiotherapy. In 2007 this project completed the safety recommendations for cobalt-60 external beam therapy and initiated the study for brachytherapy. The project will also include radiotherapy treatments with linear accelerators.

15. A project on continuous improvement of the regulatory control of medical exposure, initiated in 2006, made considerable progress in 2007. This included conducting a review of the experience of individual Member States in adapting national regulations to the Agency's safety standards with regard to medical exposure and implementing the regulations. Uruguay has joined this activity and hosted the first meeting.

A.2.4. Regulatory network

16. Senior regulators have recognized the need and the value of establishing a safety network for exchanging regulatory experience and practices. This was emphasized during recent regulatory conferences and workshops, in particular during the IRRS workshop in France referred to in paragraph 3 above. The objectives of such a network may include: the promotion of international cooperation; the systematic exchange of regulatory practices; the collection and dissemination of regulatory information, actions, initiatives and lessons learned; and the analysis and reporting of regulatory issues, challenges and trends. The development of a regulatory network is being considered by the Agency. In this context, the results of the IRRS missions will be integrated within the network.

B. The Agency's safety standards programme

B.1. "Beyond the Action Plan" activities

17. With the approval of Safety Fundamentals No. SF-1: *Fundamental Safety Principles* by the Board of Governors in September 2006, the Commission on Safety Standards (CSS), at its November

2006 meeting, discussed a new report from the Secretariat entitled *Beyond the Action Plan for the Development and Application of the IAEA Safety Standards: Overall Structure of Safety Standards*. The report proposed an evolutionary approach for the continuous improvement of the safety standards and to maintain a manageable number of safety guides. It was generally agreed that the report provided a good basis for future work and, as a result, the CSS established a subgroup to carry forward the work. The subgroup was composed of the chairs of the four safety standards committees, several members of the CSS and the Secretariat.

18. The subgroup issued a first report in February 2007 and a second report in March 2007. Both reports analysed the completeness of the current set of requirements in light of the safety fundamentals and proposed a new structure for the integration of thematic requirements into a single volume in the long term and a transition process. The set of Safety Guides to be developed within the proposed structure is contained in the second report. These reports were discussed by the safety standards committees and by the CSS in the first half of 2007. It was felt that further study was needed, in particular with regard to the relationship between the long term structure and the ongoing revision of the Basic Safety Standards. A report will be submitted to the November 2007 CSS meeting.

B.2. Revision of the Basic Safety Standards

19. The report of the review of the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (BSS), together with a document preparation profile (DPP) for the revision of the BSS, was reviewed and approved by the four safety standards committees in September and October 2006, and by the CSS in November 2006. The report stressed the importance of maintaining stability in international standards and this was also stressed by the General Conference in resolution GC(50)/RES/10, which further cautioned against making changes to the BSS that were not warranted. The committees and the CSS also approved a process for 'criteria for change' to be used in justifying changes to the text of the BSS.

20. Work on revision of the BSS started in early 2007, with a meeting organized by the Agency with the co-sponsors and potential co-sponsors of the BSS to prepare the schedule for developing the text of the revised BSS. Seven drafting meetings were held between March and May 2007. Material relating to four of the chapters of the revised BSS was reviewed by the Radiation Safety Standards Committee and the Waste Safety Standards Committee at their joint meeting in April 2007. Based on the outputs from the drafting meetings, the Secretariat developed a first draft of the revised BSS that was reviewed at a technical meeting held in Vienna from 16 to 20 July 2007. Based on the discussions at the meeting, the Secretariat is revising the draft for feedback from the safety standards committees at their autumn 2007 meetings.

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

21. Education and training in nuclear, radiation, transport and waste safety continues to be a high priority activity in Major Programme 3. A common approach is used for a consistent implementation of the strategic plan endorsed by the General Conference in resolution GC(45)/RES/10.C. The focus is on train-the-trainers, preparation and wide distribution of exemplary training material based on the Agency's safety standards, and support to postgraduate education. Technical cooperation projects, both national and regional, and safety networks are used as the principal means for effective delivery

of training activities. More information on education and training is available in document 2007/Note 36.

D. Nuclear and radiological emergency preparedness and response

D.1. The Agency's Incident and Emergency Centre (IEC)

22. As the global focal point for international preparedness, communication and response to nuclear and radiological incidents or emergencies, the IEC stands at the heart of effective and efficient coordination of these activities worldwide. The IEC is able to provide round the clock assistance to Member States in dealing with nuclear and radiological events — including security related threats — through timely and efficient services and the provision of coordinated international response and assistance. Under the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Early Notification and Assistance Conventions), the IEC coordinates the actions within the Agency, as well as with other international organizations. In March 2007, the IEC was activated to basic response mode in reaction to a bomb threat against the Forsmark NPP in Sweden, facilitating information exchange during the event. This was the first time that the arrangements set out in the Emergency Notification and Assistance Technical Operations Manual (ENATOM) were employed for a security related event.

D.2. Long term sustainability of the international incident and emergency response system

23. In response to the request by the General Conference, in paragraph 58 of resolution GC(50)/RES/10.A, an evaluation was carried out by the Secretariat on the long term sustainability of the system, in particular in light of the new tasks associated with the International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies. Based on this evaluation, additional regular budget staff and additional funding through extrabudgetary resources, are required.

D.3. Response Assistance Network (RANET)

24. In 2006, the third edition of the main assistance network document, *IAEA Response Assistance Network*, was published. It is a complete revision of the previous edition with all relevant sections updated to reflect a new broader operational concept for the network. RANET functions as a tool for supporting the provision of international assistance in case of a radiation event, and for cooperation and harmonization of response capabilities of Member States offering assistance. In order to ensure an effective and efficient international response to an event, Member States are encouraged to register under RANET.

D.4. International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies[2]

25. Experts working on the implementation of the international communication and international assistance part of the Action Plan finalized their work and presented their recommendations to the competent authorities in July 2007. The competent authorities considered and generally agreed with the technical recommendations. These recommendations included the endorsement of a unified system for incident and emergency communication that was developed pursuant to resolutions GC(48)/RES/10 and GC(49)/RES/9. Following the recommendations, the third and final phase of the Action Plan implementation has commenced.

D.5. Code of conduct on international emergency management

26. In December 2006, a technical meeting to discuss a draft Code of Conduct on International Emergency Management for Radiation Events took place. The meeting expressed general support for the draft Code of Conduct. Numerous Member States provided important comments that have been implemented. Some Member States expressed concern as to whether a Code of Conduct is the appropriate instrument to achieve the desired objectives.

D.6. Preparing first responders to a radiological emergency

27. In 2006, the Agency published the *Manual for First Responders to a Radiological Emergency* under its Emergency Preparedness and Response Series. The manual provides practical guidance for those who would respond during the first few hours to a radiological emergency and for national officials who would support early response activities. The manual was co-sponsored by the International Technical Committee for the Prevention and Extinction of Fire (CTIF), PAHO and WHO. A website[3], based on the manual, has also been developed.

D.7. Strengthening Member States' preparedness

28. During the reporting period, Egypt and Qatar hosted Agency Emergency Preparedness Review (EPREV) missions for a peer appraisal of the national arrangements for emergency preparedness and response.

E. Nuclear installation safety

E.1. Report of the Secretariat to the Fourth Review Meeting of Contracting Parties of the Convention on Nuclear Safety

29. Based on the request of the Third Review Meeting of Contracting Parties of the Convention on Nuclear Safety (CNS), the Secretariat has prepared a report, already made available to Contracting Parties, which summarizes the significant issues, developments and trends in enhancing nuclear safety. Report preparation involved identification of issues and trends from safety review services performed

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[2] The background for the Action Plan is available in Annex 3 of document GOV/INF/2004/10-GC(48)/INF/7.

[3] http://www-ns.iaea.org/tech-areas/emergency/emergency-response-actions.asp

during 2004, 2005 and 2006, as requested by the CNS. The significant issues and trends were then compiled and grouped by topical areas.

E.2. NPP operational safety

30. NPP operational safety performance, in general, has remained at a high level throughout the world. In addition, operational experience feedback programmes to prevent event recurrence are relatively mature in the nuclear power industry. However, weaknesses in the sharing of information on recent and past events affecting the safe performance of reactivity control systems during power change and shutdown in NPPs have recently been identified. In light of events which have taken place in several Member States., the Agency is organizing a technical meeting, to be held from 3 to 5 October 2007 in Tokyo, Japan, to exchange lessons learned, and to identify possible further corrective actions and necessary technical support.

31. In 2006–2007, several Member States with developed nuclear programmes (Belgium, Finland, Germany, Republic of Korea and Sweden) requested Operational Safety Review Team (OSART) services either for the first time or following a significant period of interruption. Others, such as the Russian Federation and USA, joined the group of Member States that regularly invite OSART missions to their NPPs. The Russian Federation and USA have decided to have one OSART mission every three years and to use the results for preparing their national report to the Review Meeting of the Contracting Parties to the Convention on Nuclear Safety. The Agency organized four OSART missions and nine follow-up visits in 2006. In 2007, six OSART missions and two follow-up visits took place. In addition, the Agency organized one Peer Review of Operational Safety Performance Experience (PROSPER) follow-up visit in 2006, two PROSPER missions in 2007 and one follow-up visit in 2007.

32. The most important performance indicator of the effectiveness of responses to OSART recommendations and suggestions is the ratio of issues resolved or having satisfactory progress by the time of the follow-up visit, which usually takes place about 18 months after the OSART mission. This performance indicator has been constantly improving over the past six years and reached 97% in 2006. This more complete response may be associated with the new initiative to directly reference all issues to specific requirements of the Agency's safety standards. This approach guarantees objectivity of the assessment of NPP safety status.

33. The aim of an initiative to enhance the flexibility of the OSART service, by tailoring the scope of the review to the needs of the customer, is to improve customer satisfaction. This coincides with the goal of integrating other safety review services into the OSART programme. New review modules for long term operation, probabilistic safety assessment (PSA) applications (risk informed decision making), accident management and preparations for decommissioning are now available. A review module on commissioning is also available. If a request involves some of these new optional review modules, the scope of OSART could be reduced by skipping some non-core review areas. Core review areas[4] are linked to vital functions of NPP operations and will be included in every OSART review.

34. Currently 31 countries with NPPs participate in the Incident Reporting System (IRS). There are now 3400 event reports within the system. Since April 2006, the reports have been available in a user-friendly web-based system, with a full-text database and a powerful search engine. To date, around 900 users have registered for access to the system. The capacity for data input, storage and access to written, numerical and graphical information is increasing the reporting and subsequent analytical capabilities and making IRS more effective in the enhancement of nuclear safety. The year 2006 saw

[4] Management, organization and administration; operations; maintenance; technical support and radiation protection.

an increase of 25% in the number of reports submitted and preliminary estimates for 2007 indicate a similar increase.

E.3. Nuclear safety infrastructure for countries embarking on a nuclear power programme

35. In October 2006, the Director General established the Nuclear Power Support Group in the Secretariat to ensure coordinated Agency support to Member States considering either their first nuclear power programme or an expansion of their programme. In February 2007, document GOV/INF/2007/2: *Considerations to Launch a Nuclear Power Programme* was prepared, which emphasized that by its nature a nuclear power programme is a major undertaking involving issues associated with nuclear material, ionizing radiation and the related challenges. In May 2007, the same material was published as a brochure and is being widely distributed.

36. In 2007, Agency missions visited a number of Member States, inter alia, Belarus, China, Egypt and Jordan, as well as the Gulf Cooperation Council, to discuss the elements of assistance required for the development of a nuclear power programme.

37. At its meeting in March 2007 in India, the International Nuclear Safety Group (INSAG) discussed a report under preparation on the nuclear safety infrastructure required for the development of a nuclear power programme.

E.4. Pilot Safety Evaluation During Operation of Fuel Cycle Facilities (SEDO) mission results

38. From 21 April to 9 May 2007, the Agency conducted a pilot SEDO mission to the Brazilian Nuclear Industries' uranium fuel fabrication facilities in Resende, Brazil. Six experts (including the team leader) plus two observers from Argentina covered all SEDO review areas agreed upon during the preparatory mission in February 2006. The objectives of the mission included verifying the adequacy of the Agency's documentation in field implementation (SEDO guidelines and experts' training package) and identifying potential improvements for SEDO missions to other types of fuel cycle facilities.

39. The mission identified good practices in management, safety infrastructure, working conditions and staff relations and made recommendations in a number of areas. Other areas reviewed included safety methodology and practices, criticality safety, safety culture, operating experience feedback, waste management and dose evaluation methodology.

40. Both the team members and facility management acknowledged the benefit of this peer review process for identifying and prioritizing safety improvements in facilities of this type. Further SEDO missions to similar facilities are under preparation as part of the further development of the review process and improvement of worldwide nuclear fuel cycle facilities.

E.5. Code of Conduct on the Safety of Research Reactors[5]

41. The provisions and guidance in the Code of Conduct have been integrated into appropriate Agency safety review services, technical cooperation projects and extrabudgetary programmes. Application of the Code of Conduct is being accomplished through implementation of national safety regulations. Member States are being encouraged to make full use of the Agency's safety standards relevant to research reactors and the legal and governmental infrastructure for nuclear, radiation,

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[5] The background for the Code of Conduct on the Safety of Research Reactors is available in document GOV/2004/4.

radioactive waste, and transport safety. To assist in this effort, two further Safety Guides relevant to research reactors were published in 2006. Currently, work is being completed on a further three relevant Safety Guides together with three supporting documents.

42. Following the recommendations made by the December 2005 open-ended meeting that, inter alia, periodic meetings be held to exchange information and discuss experience in application of the Code of Conduct, three regional meetings were held in 2006 and the first half of 2007 in Africa, Asia and the Pacific and Eastern Europe. These meetings allowed participating countries to exchange information and views on the recommendations in the Code of Conduct, to discuss the results of self assessments made on the status of research reactor safety and to identify needs for assistance in applying the Code of Conduct.

43. As recommended by the December 2005 open-ended meeting, an international meeting on the application of the Code of Conduct is being organized for 2008, close to the Fourth Review Meeting of the Contracting Parties to the CNS. Prior to this meeting, a final regional meeting covering Latin America is also being organized.

E.6. Enhancing research reactor operational safety

44. In 2006, the Agency started an evaluation of the Integrated Safety Assessment of Research Reactors (INSARR) mission reports to determine the rate of implementation of the recommendations resulting from these missions and to identify the main research reactor common safety issues and trends. The preliminary conclusions of the evaluation indicate the need to enhance the role and responsibilities of the safety committees and the need to improve the safety analysis of experiments. Ageing of research reactors as well as ageing of personnel remains an important safety issue for the majority of facilities. Decommissioning plans have been found to be undeveloped for many research reactors especially for those under extended shutdown. A clear strategy for management of waste generated by research reactors needs to be established. There are research reactors without full licence coverage due to gaps in the national regulatory systems.

45. The Incident Reporting System for Research Reactors (IRSRR) allows participating Member States to disseminate operating experience feedback. To date, 50 Member States have joined the IRSRR. In 2006, the Agency initiated an evaluation of the incident reports in the IRSRR to identify significant safety trends and issues. The preliminary results of this evaluation show that human factors and ageing of components are the most important root causes of the incidents reported to the IRSRR. The evaluation will be completed in 2007, including a follow-up activity to investigate correlations between INSARR mission reports and IRSRR reports.

46. In 2006, an assessment was carried out of the results of safety review missions conducted at research reactors in China, Indonesia, Malaysia, Philippines, Thailand and Vietnam. The results included identification of common safety issues and regional trends.

E.7. Monitoring and safety enhancement of research reactors under project and supply agreements

47. The Agency continues to operate a follow-up system monitoring the safety of research reactors under project and supply agreements. The system is based on the collection and analysis of data on safety performance indicators and the dissemination of operating experience.

48. A technical meeting, attended by 19 Member States, was held in 2007 to explore ways to enhance the safety and security of research reactors under project and supply agreements. In addition to providing a forum for information exchange, meeting participants were updated on the Agency's safety standards relevant to research reactors, international best practice on application of the Code of

Conduct on the Safety of Research Reactors and the results of the safety review missions to research reactors under project and supply agreements. The Agency also updated participants on the reporting obligations as specified by the agreements and renewed the invitation to provide responses on the safety performance indicators. Safety aspects of core conversion from high enriched uranium (HEU) to low enriched uranium (LEU) were also discussed.

E.8. Long term operation of NPPs

49. Most of the NPPs operating worldwide could be capable of safe long term operation (LTO), i.e. operation beyond the established time frame originally set forth by licence term, design limits, standards or regulations. Activities such as periodic safety reviews, ageing management programmes and plant life management provide important measures to ensure safety for continued operation. LTO needs to be based on an integrated and comprehensive approach that satisfies the regulatory requirements. The approach should incorporate technical developments, the utilization of current codes and standards, employment of new tools and analytical methods, and the incorporation of operational performance.

50. The Agency is focusing its programme in this area on preparing or reviewing and revising its safety standards and supportive documents as well as strengthening and expanding its review services and the exchange of information to reflect these priorities. The most significant of these activities are the preparation of a new Safety Guide on ageing management and a new Safety Report on long term operation. In addition, the Agency's Extrabudgetary Programme on Safety Aspects of Long Term Operation of Water Moderated Reactors (SALTO) assists Member States in establishing and maintaining a programme for safe long term operation. The Agency is conducting full scope SALTO peer review missions for South Ukraine NPP in Ukraine and for Kori Unit 1 in the Republic of Korea. The Agency has also established the Safety Knowledge-Base for Ageing and Long Term Operation of Nuclear Power Plants (SKALTO) which serves as a framework for sharing information on ageing management and long term operation of NPPs. In 2007, SKALTO is being expanded and improved, taking into account the results and feedback of recent activities.

51. In order to enhance the effectiveness and efficiency of work in these areas, the Secretariat's Department of Nuclear Safety and Security and Department of Nuclear Energy implemented joint action plans and activities.

E.9. Centre for Advanced Safety Analysis Tools (CASAT)

52. CASAT has established an internet based system that provides Member States with a means for collaboration on safety assessment methods and tools. The coordinated research project on uncertainties in best estimate safety analysis, initiated in October 2006, is the pilot project for the use of the collaboration features offered by CASAT. In addition, CASAT has established a means for distance learning using its internet based system, and is continuing to develop a safety assessment training curriculum aimed at focused and result oriented skill development in safety analysis that will allow the effective utilization of best expert resources in Member States.

E.10. European Commission–Ukraine extrabudgetary programme joint project

53. At the request of the European Commission (EC) and the Government of Ukraine, the Agency is conducting a comprehensive and independent safety review against current Agency safety standards of all water cooled water moderated power reactors (WWERs) presently in operation in Ukraine. This safety review will implement the general memorandum of understanding between the Government of Ukraine and the European Union (EU) signed in December 2005 to establish a common strategy for

the gradual integration of the energy market of Ukraine with the EU market. As defined in the terms of reference agreed in April 2007 between the parties, this joint project between Ukraine, EC and the Agency will last for two years covering the 15 units of three models (1000, 1000/SS, 440/230) of this type of reactor. The Agency review will be focused mainly on design safety aspects, although operational safety, waste, decommissioning and regulatory issues will also be addressed. The reviews will be done with the active participation of the Ukrainian regulatory authority.

E.11. Safety Analysis Report Review Plan (SARRP)

54. The experience derived from the conduct of numerous safety review services showed that there are two main needs to be pursued. First, the need to constantly improve the quality of the service and its adherence to the Agency's safety standards and second, the need to systematically collect feedback from the safety reviews on the use and application of the Agency's safety standards for future revisions.

55. To meet these two objectives, the Agency has completed the first part of the development of the SARRP, an electronic tool that facilitates the implementation of the safety reviews and provides guidance for a systematic use of, and compliance check with, the Agency's safety standards. SARRP also provides a living and user friendly database with the results of the safety reviews and the feedback on the Agency's safety standards gained from each safety review. A pilot case of SARRP has been developed that includes two selected systems (containment and emergency core cooling systems) of an NPP and work is progressing for coverage of the entire NPP.

E.12. Leadership for safety and safety culture

56. It is now widely accepted that strong leadership and effective management for safety have a profound influence on the safe and reliable performance of nuclear installations. Part of the leadership responsibility includes the communication of risks and incidents in an open and transparent manner, as well as the avoidance of complacency. The new IAEA Safety Standards, in particular the Safety Fundamentals issued in 2006, emphasize the importance of establishing and sustaining effective leadership and management for safety. The third Review Meeting of Contracting Parties of the Convention on Nuclear Safety held in 2005 also pointed to the importance of leadership in management for safety and safety culture as priority areas for operators and regulators. The Agency is focusing its programme in the area of management systems on revising its standards to properly reflect this. In addition, the safety review services and the fostering of information exchange have been strengthened to reflect the increased importance of management for safety and safety culture. In order to enhance the effectiveness and efficiency of work in these areas, the Secretariat's Departments of Nuclear Safety and Security and of Nuclear Energy have implemented joint action plans and activities.

F. Radiation safety

F.1. Implementation of the International Action Plan for the Radiological Protection of Patients[6]

57. The programme of training interventional cardiologists (started in May 2004) has gained new momentum with the establishment of an Asian network of cardiologists in radiation protection through an RCA project. The network is independently launching an e-newsletter, an important step towards achieving sustainability in this area. The newsletter will be circulated through national and regional cardiological societies. The network has started arranging training activities in national and regional cardiology conferences. By these actions, it is hoped to achieve sustainability of radiation protection actions in this area in Member States of Asia by 2010. The first training programme for non-radiologist and non-cardiologist doctors, such as orthopaedic surgeons, urologists and gynaecologists, engaged in the use of fluoroscopy in their work, was held in September 2006 in New Zealand. The Agency is in the process of developing training material.

58. The Agency's website[7] for radiological protection of patients that was launched during the week of the 50th session of the General Conference is updated monthly and is attracting the attention of health professionals and the public. Future plans include additional features to help counterparts in Member States involved in technical cooperation projects exchange information.

59. Fifteen additional Member States are participating in the projects on radiological protection of patients for the 2007–2008 programme cycle, and a total of 81 Member States are benefiting from Agency support in this area. In many participating Member States, activities have moved beyond raising awareness of patient protection issues to actions such as surveying patient radiation doses and optimizing and comparing doses with established international standards. Some Member States have already reported dose reductions without affecting diagnostic and treatment quality.

60. The preparations for the international conference on radiological protection of patients as requested by the General Conference at its 50th session could not be started due to lack of funding.

F.2. Implementation of the Action Plan for Occupational Radiation Protection[8]

61. The steering committee of the Action Plan held its second meeting in January 2007. An updated working plan was approved and the lead on various actions has been adequately defined. For example, WHO has agreed to lead action 14 on probability of causation and ILO will manage action 12 on holistic approach, both with strong support from the Agency. At the request of the steering committee, the joint ILO–Agency Secretariat presented an annual progress report in February 2007. Substantial progress has been made on many actions.

62. Accreditation of the quality management system of the Agency's laboratory for radiation monitoring and protection to the International Organization for Standardization's Standard ISO 17025

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[6] The background for the Action Plan is available in Annex 6 of document GOV/INF/2004/10-GC(48)/INF/7.

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

[8] The background for the Action Plan is available in Annex 7 of document GOV/INF/2004/10-GC(48)/INF/7.

has been granted by the Austrian Accreditation Council for 13 well defined processes of individual and workplace monitoring. This accreditation is the first ever granted to an Agency or a laboratory in the UN system.

F.3. Promotion of effective and sustainable national regulatory infrastructures for the control of radiation sources

63. Since September 2006, 18 countries have received Radiation Safety and Security of Radioactive Sources Infrastructure Appraisal (RaSSIA) missions and a further 18 missions are scheduled for 2007–2008. The RaSSIA programme is being incorporated into the new IRRS, which will accommodate the full RaSSIA protocol and many other specific and thematic areas associated with the regulation of radiation safety. To date, 44 Member States have received a RaSSIA mission.

64. RaSSIA, the Regulatory Authority Information System (RAIS), the Radiation Safety Regulators Network (RaSaReN) and regulatory body staff training programmes now incorporate the additional regulatory requirements and guidance of the Code of Conduct on the Safety and Security of Radioactive Sources, the Guidance on the Import and Export of Radioactive Sources and the Categorization of Radioactive Sources. These updates address establishing a national registry or inventory of radiation sources, cradle-to-grave oversight of sources, national strategies for locating, identifying and regaining regulatory control over orphan sources, and strengthening control over the import and export of radioactive sources.

65. RAIS 3.0, the information management tool for the day-to-day activities of regulatory bodies, has been rolled out in SQL and Microsoft Access versions to 121 Member States, combined with national and regional training events in Argentina, Austria, Malta, Nigeria, Qatar, Sudan and Tunisia during 2006–2007. RAIS 3.0 is available in a format which allows each Member State to further develop the system to its own particular requirements. Ninety-four countries are now either using RAIS in their daily activities or are in the process of assessing RAIS with a view to managing their existing national register of sources or to creating a register. In addition, some Member States have revised their existing systems using RAIS as the reference. Overall, the majority of Member States will soon have a national register of radiation sources and an information management system harmonized and compatible with current international requirements and guidance.

66. RaSaReN has been established to facilitate worldwide exchange of knowledge and experience essential to establishing and maintaining an effective and sustainable regulatory infrastructure for radiation safety and security of radioactive sources. Currently the RaSaReN website may be accessed by registered staff of regulatory bodies in Member States. To date, 73 regulatory bodies, through 175 representatives, have joined the network.

F.4. Protecting the public

67. The web-based version[9] of the Agency's Database on Discharges of Radionuclides to the Atmosphere and the Aquatic Environment (DIRATA) was launched in 2006.

68. The first Technical Meeting on Monitoring Radionuclides in Foodstuffs Traded Internationally, held in Vienna from 11 to 15 December 2006, discussed the strategy for routine and emergency monitoring of radionuclides in foodstuffs and ways of implementing the relevant portions of the report of the 29th session of the Codex Alimentarius Commission.[10]

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[9] http://dirata.iaea.org

[10] ALINORM 06/29/41.

F.5. Implementation of the Plan of Activities on the Radiation Protection of the Environment

69. The international coordination group on the radiation protection of the environment was established by the International Plan of Activities on the Radiation Protection of the Environment. It serves as a mechanism to facilitate the coordination of activities among international organizations by reviewing their ongoing work related to the protection of non-human species. The Agency organizes the secretariat of the coordination group. In February 2007, the annual coordination group meeting was attended by 17 participants from the Agency and six other international organizations and seven Member States (Australia, France, Germany, Japan, Spain, Sweden and UK)[11]. Greenpeace attended as an observer.

70. Members of the coordination group will offer comments on the draft United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) report on effects of ionizing radiation to biota, which updates the 1996 report. UNSCEAR expects to publish the report in 2008.

71. The IUR, the Norwegian Radiation Protection Authority and the French Institute for Radiological Protection and Nuclear Safety are organizing a conference on the radiation protection of the environment that will take place, with Agency participation, from 15 to 20 June 2008, in Bergen, Norway.

72. The European Commission's ERICA[12] project, which targets organism and ecosystem protection through generation of relevant databases to support assessments and through the development of assessment and risk characterization methodologies, was completed in February 2007. A new European Commission project, PROTECT, will follow up using the ERICA results to evaluate, in a regulatory context, the different approaches to protection of the environment from ionizing radiation and to compare these with the approaches used for non-radioactive contaminants. The Agency and several members of the coordination group will be asked to participate in the activities of the project work packages.

G. Safety and security of radioactive sources

G.1. Code of Conduct on the Safety and Security of Radioactive Sources: Technical meeting on information exchange about States' experience with the implementation of the Code

73. The Agency held an open-ended meeting of technical and legal experts on *sharing of information as to States' implementation of the Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct) and its supplementary Guidance on the Import and Export of Radioactive Sources (Guidance)* in Vienna from 25 to 29 June 2007. The objective of the meeting was to promote a wide exchange of information on national implementation of the Code of Conduct and Guidance. In line with the non-legally binding nature of the Code of Conduct and Guidance, participation and presentation of papers was on a voluntary basis. The meeting was attended by 122 experts from 70 Member States, two non-Member States, and observers from the EC, FAO and the Organization for

[11] The representatives from Canada and the USA were unable to attend.

[12] Environmental Risk from Ionising Contaminants: Assessment and Management.

Security and Co-operation in Europe (OSCE). Canada and the USA provided funding to support the participation of experts from States that otherwise could not have attended the meeting. Experts from 53 States took the opportunity to present papers on their experiences in implementing the Code of Conduct and Guidance. There was wide exchange of information and a variety of fruitful discussions on a range of topics. Participants appreciated the open nature of the discussions, and encouraged the Agency to hold similar meetings in the future — perhaps on a triennial basis — subject to availability of funds. (The report of the Chairman of the meeting is included in the Note by the Secretariat (2007/Note 36) available on the Agency's GovAtom website.)

G.2. Ionizing radiation warning symbol

74. A new radiation warning symbol to supplement the existing trefoil sign for ionizing radiation has been published as ISO Standard 21482, "Ionizing-Radiation Warning – Supplementary Symbol". The new symbol is the completion of a multi-year effort by the Agency to develop a universal radiation warning symbol so that anyone anywhere will understand the message of "Danger – Stay Away." The development of the symbol was proposed at the International Conference of National Regulatory Authorities with competence in the Safety of Radiation Sources and the Security of Radioactive Materials organized by the Agency in Buenos Aires, Argentina in 2000 and was included in the Agency's Revised Action Plan for the Safety and Security of Radiation Sources[13]. The new symbol universally conveys the intended message irrespective of the person's age, education or cultural background. It is intended to supplement rather than replace the trefoil sign for ionizing radiation on Category 1, 2 and 3 sources defined as dangerous sources capable of causing death or serious injury if accessed by unauthorized persons.

G.3. Nuclear power sources in outer space

75. One of the sub-committees of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), the Scientific and Technical Subcommittee (STSC), has, over recent years, reviewed the issue of safety of nuclear power sources used to provide on-board power for some spacecraft. The STSC requested support from the Agency to develop a safety framework for nuclear power sources in outer space.

76. The STSC has approved a multi-year work plan for this task, and a parallel proposal is being assessed within the Secretariat, making use of the advice of the safety standards committees and the Commission on Safety Standards (CSS). Drafting work is expected to begin in 2007. Successive drafts will undergo review by both STSC and the Agency, and a joint publication is anticipated in 2010.

G.4. Recovery and management of disused radioactive sources, including repatriation to countries of origin

77. Over the past decade the Agency has provided assistance to Member States for recovering, conditioning and rendering safe and secure spent radioactive sources. In many cases, sources were repatriated to the country of origin. Category 1 to 3 radioactive sources used in teletherapy devices, irradiators and radioisotope thermoelectric generators are among the sources that have been recovered either for long term storage or for repatriation to suppliers or manufacturers. In 2006, over 444 TBq (12 000 Ci) of cobalt-60 and 148 TBq (4000 Ci) of caesium-137 were recovered and conditioned. In addition, 740 TBq (20 000 Ci) of strontium-90 were recovered and rendered safe and secure in their respective countries or repatriated to the country of origin. Sources with transuranic radioisotopes were also recovered. Over 800 grams of plutonium-239 and 6 grams of americium-241, in the form of

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[13] Attachment to document GOV/2001/29-GC(45)/12.

sealed radioactive sources, were either repatriated to the country of origin or conditioned and stored for future repatriation. Several Member States — including Armenia, Australia, Bulgaria, Côte d'Ivoire, Croatia, Kyrgyzstan, Libyan Arab Jamahiriya, South Africa, Sudan and United Republic of Tanzania — benefited from the programme in 2006.

78. The repatriation of disused radioactive sources to countries of origin faces a number of challenges for which international support is needed. Technical issues, ranging from source recovery and collection to the availability of certified transport packages and shipping organizations, need to be addressed. The Agency will continue to facilitate the repatriation of disused radioactive sources, especially those that can be recycled or reused.

H. Transport safety

H.1. International Expert Group on Nuclear Liability (INLEX)

79. At its seventh meeting held in June 2007 INLEX, inter alia, exchanged views on new developments in the field of civil liability for nuclear damage. The Group also identified further specific actions to address possible gaps in the scope and coverage of the liability instruments. Such actions could consist of clarification of these issues during INLEX's outreach activities and the development of a specific Chapter on Nuclear Liability in Part II of the Handbook on Nuclear Law which is currently being prepared by the Secretariat. In addition, States could set limits beyond the standards contained in the international nuclear liability instruments or could adopt common standards.

80. Furthermore, the Group agreed that the minimum amount of liability under the 1963 Vienna Convention on Civil Liability for Nuclear Damage did not remain at $5 million but rather that the correct minimum amount was dependant on the day-to-day price of gold, and that it was currently equivalent to approximately $93 million.

81. Further the Group considered the establishment of new maximum limits for the exclusion of small quantities of nuclear material from the scope of application of the Vienna Conventions on nuclear liability, which was last done in 1978. In this regard, document GOV/2007/39 has been prepared for the consideration of the Board of Governors at its meeting in September 2007.

82. Arrangements for the third regional Workshop on Liability for Nuclear Damage, scheduled to be held in Rustenburg, South Africa, from 31 October to 2 November 2007 are underway and Member States of the African region will be invited to attend this workshop. The Group's work is ongoing and it is expected that it will continue to be a forum of expertise for discussions between shipping and coastal States and to provide advice on the nuclear liability instruments adopted under the Agency's auspices.

H.2. Implementation of the Action Plan for the Safety of Transport of Radioactive Material[14]

83. All actions, with one exception, identified in the Action Plan are either complete or on schedule for completion. The exception is the action for the Secretariat to initiate a coordinated research project

[14] The background for the Action Plan is available in Annex 4 of document GOV/INF/2004/10-GC(48)/INF/7.

on severe transport accidents, for which Member State response has been insufficient to start the project.

H.3. Harmonization with the United Nations

84. As recommended by the General Conference, the Secretariat initiated a dialogue with the United Nations Economic Commission for Europe (UNECE) with a view to harmonizing Safety Requirements TS-R-1, *Regulations for the Safe Transport of Radioactive Material: 2005 Edition* (Transport Regulations) with those of the UN's Model Regulations on the Transport of Dangerous Goods. The results of the first effort included a meeting with UN organizations and dangerous goods experts from Member States. Harmonization has been identified as one of the significant bases for the Transport Regulations. As a result, the publication of a new edition of the Transport Regulations in 2009 was proposed to the CSS and in June 2007, the CSS approved the document preparation profile for this new edition.

H.4. Denials of shipments

85. As recommended by the General Conference, the Agency held the first meeting of the International Steering Committee on Denial of Shipments of Radioactive Material from 14 to 16 November 2006. Members of the Steering Committee include Member States, and international governmental and non-governmental organizations. The mandate and role of the Steering Committee is to identify, evaluate and implement actions to alleviate denials of shipment on the basis of an action plan. In doing so, the Steering Committee will review existing activities, improve understanding of the reasons for denials of shipment and act as the focal point for receiving notifications. Additionally, in July 2007, the Agency completed a regional workshop on this subject in Montevideo, Uruguay for the Latin America region. During this workshop, countries in the Latin America region agreed to take a number of actions to address the issue. The results of the workshop were a regional action plan to prevent or reduce instances of denials of shipment and to alleviate the hardships to users of radioactive material that has been denied and delayed; milestones in the implementation of the action plan; and the specific roles that could be played by each participant. Discussions among the participants have continued beyond the meeting. These communications have resulted in additional actions being proposed by the participants and in a refinement of the actions agreed at the meeting.

I. The safety of radioactive waste management

I.1. Strategy for radioactive waste management

86. The Agency convened an international workshop on a common framework for the safety of radioactive waste management and disposal in Cape Town, South Africa, in July 2007. The workshop had been triggered by the continuing international interest in the establishment of comprehensive national radioactive waste management policies and the implemention of strategies that will ensure that all radioactive waste is appropriately managed and a safe solution found for the disposal of all types of radioactive waste. The concept of a common framework linking radioactive waste types to disposal options in a manner that respects international safety standards and takes cognizance of local circumstances has been evolving for a number of years. Important to the concept is a comprehensive system of radioactive waste classification — a topical area where the Agency Safety Standards are presently being revised — and international consensus on methodological approaches to safety demonstrations to provide assurance of compliance with safety standards. During the workshop, there

was consensus that international standards on radioactive waste classification should encompass all waste types, including those containing naturally occurring radionuclides and disused sealed sources, and should be based on long term management of the waste, essentially waste disposal. There was also agreement that radioactive waste with minimal amounts of radioactive content, referred to as very low level waste, was a legitimate and useful concept and should be part of the classification scheme. It was recognised that some radioactive waste is not suitable for near surface disposal, but does not warrant the degree of isolation and containment provided by geological disposal. Disposal at intermediate depths (between a few tens of metres and several hundred metres) in a suitable geoclinal environment was considered to offer good prospects for safety. The revised standards on radioactive waste refer to such waste as intermediate level waste. Previously, this term was used to describe waste which on account of the radiation dose rate at the package surface required remote handling. Although classifying radioactive waste based on disposal options was considered to offer many benefits, it was recognised that the safety of any particular disposal facility must be demonstrated, including the suitability of waste for disposal in the facility. The conclusions from the workshop will be used to further develop the Agency Safety Standards and supporting documents.

87. On the occasion of the 20th anniversary of the Goiânia accident, an International Workshop on remediation strategies and long term management of radioactive waste after accidental radioactive releases to the environment is being organized in cooperation with the Government of Brazil from 3 to 5 October 2007, in Goiânia, Brazil.

I.2. Safety assessment in radioactive waste management

88. Central to providing an assurance of safety is the process of carrying out safety assessment and structuring all the considerations supporting the case for waste management facilities and activities. Safety assessment is required for a broad range of such activities and facilities from waste processing, through storage to disposal and must also address the clearance of materials and control of effluent discharges to the environment. The improvement and development of harmonized approaches to safety assessment is an area where a considerable amount of effort has been expended by the Agency and in which considerable interest is expressed by Member States. One of the projects in this area — Application of Safety Assessment Methodologies for Near-Surface Radioactive Waste Disposal Facilities (ASAM) — is being brought to a conclusion and a follow up project is being developed to provide for an ongoing forum for exchange of experience and improvement in this area. A similar project concerned with safety assessment for predisposal management, the International Project on Safety Assessment Driven Radioactive Waste Management Solutions (SADRWMS), is making good progress, in particular in developing software tools to assist and guide the safety assessment process and to capture information generated. An extension of the software tool to decommissioning activities is also under consideration.

89. Many of the existing disposal facilities for low and intermediate level radioactive waste were developed and began operations before current regulatory requirements, Agency recommendations and guidance and quality management systems became available. Most of these facilities need enhancement through diverse corrective actions to comply with current good international practice. To address these needs, the Agency conducted a workshop on experience in corrective actions at near surface repositories in Budapest, Hungary, in June 2007. The workshop provided a forum for exchanging experience gained during planning and while performing corrective actions at near surface disposal facilities and in retrieval, characterization and repacking of legacy waste.

I.3. Geological disposal of high level radioactive waste

90. Significant progress has been made in recent years in a number of countries that are either developing geological disposal facilities or contemplating their development. This has led to

increasing interest worldwide in the demonstration of their safety and also to the development of harmonized approaches to such safety demonstration. The Agency has initiated the International Project on Demonstrating the Safety of Geological Disposal (GEOSAF) to examine the evolution of arguments, assessments and supporting evidence developed to provide a reasonable level of assurance of safety to all interested parties. It gives particular attention to the systematic review of such arguments, assessments and supporting evidence by regulatory bodies. The main aim of GEOSAF is to work towards harmonization of approaches worldwide to demonstrate the safety of geological disposal. GEOSAF provides a global forum for exchanging experience and ideas between organizations and authorities responsible for such safety demonstration, and for related regulatory review and approval. GEOSAF encompasses all types of geological disposal facilities, including those designed for high level waste, spent fuel if declared as a waste, conditioned high level waste from reprocessing, longer lived intermediate level waste, and other waste not suitable for disposal in near surface facilities.

J. The safe decommissioning of nuclear facilities and other facilities using radioactive material

J.1. Remediation of contaminated sites in Iraq

91. The Agency project to assist the Government of Iraq in the evaluation and decommissioning of the former facilities that used radioactive materials commenced in February 2006 with a meeting of all interested parties to agree on the overall approach. Since then, the project has moved forward significantly, with the assistance of experts from Germany, Italy, UK, Ukraine and the USA. Work to assist the development of a waste management strategy is being supported through visits of Iraqi experts to relevant facilities in France and Germany.

92. A draft nuclear law has been prepared and work continues on the drafting of regulations covering decommissioning, radiation protection and waste management. The available radiological data is being assembled and assessed for gaps, with preparation for further work to provide the additional data necessary to complete the characterization of the sites and facilities. The provision of a data management system is being pursued to manage the characterization data and track the movement of radioactive material as work proceeds. The basis of a system to prioritize decommissioning activities has been agreed and a preliminary prioritization of the sites and facilities is available, although this will be reviewed as better characterization data become available. This is a key input to the overall decommissioning plan.

93. During the second half of 2007, all of this information will be used to develop the decommissioning plan from which the longer term project work plan can be derived.

J.2. The Athens decommissioning conference and the International Action Plan on the Decommissioning of Nuclear Facilities

94. As the number of facilities reaching the end of their lifetime is continuously increasing, regulators, operators and other interested parties increasingly recognize the need for adequate planning for the safe decommissioning of such facilities, the management of associated waste, and the release of such sites from regulatory control. In the past 40 years, decommissioning has evolved from a small scale activity to a large scale industry covering a broad range of facilities including nuclear power

plants (NPPs), fuel cycle facilities, mining and mineral processing facilities, research reactors and laboratories.

95. The International Conference on Lessons Learned from Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities was held in Athens in December 2006. Almost 300 delegates from 50 Member States — including 32 developing countries — attended the conference.

96. The outcomes of the Conference [15], and the increasing number of requests from Member States for Agency support in decommissioning planning and implementation, demonstrate the need for continuation of Agency assistance, in particular in the application of the safety standards and in the transfer of experience and good practice from advanced decommissioning projects to countries with less experience in this field. Accordingly, the Action Plan on the Decommissioning of Nuclear Facilities (GOV/2004/40(Corrected)) has been reviewed and updated and is reflected in the programme and budget for the 2008-2009 cycle.

J.3. Uranium mining and milling

97. With the renaissance of the uranium industry, it is important that, when planning the development of new mines or the redevelopment of legacy sites, both operators and regulators take remediation into full account. To this end, the Agency has begun a project to involve both regulators and operators from the uranium mining industry in developing a network of information exchange centres and mechanisms to promulgate excellence in radiation protection, environmental management and site remediation.

98. The remediation of former uranium mining and milling sites in Central Asia continues to be addressed through an ongoing regional technical cooperation project. Remediation of other former uranium mining areas in Africa, Asia and Europe was also the subject of peer reviews and site visits.

J.4. Repositories for disused sources

99. Over the past 10 years, the Agency has developed, in cooperation with the South African Nuclear Energy Corporation (NECSA), a borehole system called BOSS[16] dedicated to the disposal of disused sealed radioactive sources. BOSS provides a sustainable and viable solution which, when implemented, will contribute to the safe and secure long term management of disused sealed radioactive sources. The concept is supported by an Agency Safety Guide which includes a generic safety assessment. A number of Member States, managing radioactive waste only in the form of disused sealed sources, have expressed interest in the BOSS system and have requested assistance through the Agency's technical cooperation programme. Eventually, Member States candidates for BOSS licensing and implementation will be selected in each technical cooperation region as hosts for a demonstration project. In 2006, Ghana was identified to host the BOSS pilot project in the African region. Project activities implemented in 2006 included regional training workshops on diverse aspects of project management and planning, repository development and siting approaches and licensing and safety assessment methodologies. One of the main challenges faced for the spreading of the BOSS technology is the availability of funding.

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[15] For the main outcomes see GOV/INF/2007/1; the conference proceedings are expected to be published in 2007.

[16] Borehole Disposal of Disused Sealed Sources.