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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(48)/RES/10, reports on the following subjects are submitted to the Board of Governors and the General Conference for their information:

- Radiological protection of patients (Annex 1);
- Occupational radiation protection (Annex 2);
- Promoting effective and sustainable national regulatory infrastructures for the control of radiation sources (Annex 3);
- Nuclear and radiation safety networks (Annex 4)
- Implementation of the international action plan on the safety of radioactive waste management (Annex 5);
- Implementation of the international action plan on decommissioning of nuclear facilities (Annex 6);
- Transport safety (Annex 7); and
- Safety and security of radioactive sources (Annex 8).

In addition, the Secretariat would like to update the Board of Governors and the General Conference on important developments with respect to the Agency's incident and emergency response system (Annex 9).

Radiological Protection of Patients

A. Training

1. To ensure patient safety, it is essential that health professionals using ionizing radiation are properly trained and have access to up-to-date information.

2. The Agency is working with professional societies to reach the large number (millions in the case of diagnostic radiology) of professionals. International professional societies are participating in the implementation of the International Action Plan for the Radiological Protection of Patients and have endorsed the relevant education and training material. The Agency has invited these societies to make the material known through their official journals and to make CD copies for distribution to their members.

3. The Agency granted the request from the International Organization for Medical Physics (IOMP) for permission to place the training packages on its website. Some national IOMP member societies have also placed the material on their national websites. With four regional chapters and 74 national member societies, the IOMP reaches thousands of medical physicists worldwide.

4. Training packages have been approved and are available for:
   - Radiation protection in diagnostic and interventional radiology
   - Radiation protection in nuclear medicine
   - Radiation protection in radiotherapy

5. Training packages are undergoing final approval for:
   - Radiation protection for cardiologists
   - Prevention of accidental exposure in radiotherapy

6. Many clinicians use ionizing radiation in their work but may not have received formal radiation protection training. The Agency has held two radiation protection training courses for interventional cardiologists and a third is planned for the last quarter of 2005.

B. Information exchange

7. The Steering Panel for the International Action Plan for the Radiological Protection of Patients recommended that the Internet be used to disseminate information to the large number of medical and paramedical professionals that use ionizing radiation. A group of experts met in September 2004 to prepare the terms of reference for a dedicated website.

8. A project brief has been approved and the project initiation document prepared. A test website will be accessible through the Agency’s intranet and will provide, by November 2005, access to a limited number of participants for critical review and testing.

C. Assistance

9. While training and information exchange with health professionals at large is crucial, there is also a need for promoting and monitoring implementation of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) and other IAEA safety standards.

10. The Secretariat has developed regional technical cooperation projects on medical exposure. Following a pilot exercise, a step-by-step approach to technical assistance and expert missions was extended to all Member State regional projects in 2005. Seven areas of work have been identified as first priorities and Member States have been invited to choose at least two of them to start. The seven areas are:

i. Avoidance of radiation injuries in interventional procedures using X-rays and reducing the probability of stochastic effects, especially in children.
ii. Surveys of patient doses and image quality for establishing and using guidance levels in diagnostic examinations.
iii. Exercising dose reduction in conventional radiography by using rare earth intensifying screens.
iv. Survey of mammography practice from the point of view of optimization of radiation protection.
v. Patient dose management in computed tomography with special emphasis to paediatric patients.
vi. Provision of guidelines on the release of patients after radionuclide therapy based on current recommendations of the International Commission on Radiological Protection (ICRP).
vii. Avoidance of accidental exposure in radiotherapy.

Occupational Radiation Protection

A. International Labour Organization (ILO) Convention 115

1. The ILO discharges its responsibility for occupational safety and health in the radiation protection area through the promotion of the Convention concerning the Protection of Workers against Ionising Radiations (ILO Convention 115), which has so far been ratified by 47 countries. The ILO uses the requirements for occupational radiation protection embodied in the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (BSS) as the basis for assessing compliance with ILO Convention 115.

B. Implementation of the Action Plan for Occupational Radiation Protection

2. The background for the Action Plan for Occupational Radiation Protection is available in Annex 7 of GOV/INF/2004/10-GC(48)/INF/7.

Action: *ILO, supported by the IAEA, to take steps to further promote the ratification and implementation of ILO Convention 115*.

3. The ILO has continued to promote the ratification and implementation of the Convention. The ILO anticipates further ratifications of the Convention, with two additional countries already having indicated their intention to ratify.

4. In support of ILO efforts to further promote the Convention, the agendas of Agency coordination meetings of countries participating in the Agency's model projects on upgrading regulatory infrastructures (in which more than 90 Agency Member States are currently participating) now include a presentation of the Action Plan, thus bringing ILO Convention 115 to the attention of Member States.

Action: *ILO to consider whether there is a need to review the procedures for requesting from Member States information on the implementation of ILO Convention 115 and to review the types of information being requested, so that peer reviews of occupational radiation protection programmes become more effective. Lessons learned from the application of the reporting criteria applied under the Convention on Nuclear Safety may be a useful input.*

5. The ILO presently has no specific plans to revise its reporting and review system. There are similarities (as well as some important differences) between the ILO system and the Agency's Occupational Radiation Protection Appraisal Service (ORPAS) and the two organizations now coordinate their activities and share information. The Agency involves the ILO in the appointment of suitable experts to serve on ORPAS missions. In addition, since the BSS are used by both the Agency and the ILO as the basis for establishing the status of occupational radiation protection in Member States, the Agency is keeping the ILO apprised of early developments in the review and revision of the

BSS, pending the more formal involvement of the ILO and other co-sponsoring organizations in due course.

Action: *The IAEA and ILO to continue to cooperate in the development of guidance and informatory material that will assist in the interpretation of requirements set out in conventions and standards, and in the conduct of further IAEA intercomparisons of monitoring methods for assessing occupational exposure.*

6. During the reporting period, a Safety Report Series publication entitled *Methods for Assessing Occupational Radiation Doses due to Intakes of Radionuclides* was published, and several new documents dealing with occupational radiation protection are under development. These include a draft Safety Guide on radiation protection aspects in the design of nuclear power plants and a draft Safety Report on radiation protection of itinerant workers. Two draft Safety Reports on operational radiation protection in the workplace have also been developed, dealing with dose rate and surface contamination measurement and with airborne contamination measurement, respectively. In addition, draft Safety Reports on dosimetry services for individual monitoring and a draft Safety Report on neutron monitoring for radiation protection are being developed.

7. The Agency continues to conduct intercomparisons of monitoring methods for assessing occupational exposure, to assist its Member States in complying with dose limitation requirements and to harmonize the use of internationally agreed quantities and assessment methods. Many different intercomparison exercises are at various stages of implementation. Recently, the Agency cooperated in a research project sponsored by the European Union, which involved a worldwide intercomparison exercise involving 81 laboratories in more than 40 Member States, to assess the harmonization of dose estimation for intakes of radionuclides by workers through ingestion, inhalation or wounds. An exercise to measure personal dose equivalent ($H_p(d)$) in photon fields has been started for the African region.

8. The ILO remains involved in the Agency's publications, acting as co-sponsor or promoting the use of the guidance provided in the publications.

C. ILO Code of Practice *Radiation protection of workers (ionising radiations)*

Action: *ILO, in consultation with the IAEA, to consider the concerns over the terminology used in the code of practice and determine the most appropriate means of addressing them.*

9. The ILO engaged an expert, in consultation with the Agency, to review the code of practice. The review is complete and changes to the code of practice have been proposed. The Agency has received a copy of the review findings, and the ILO is now considering them, with a view to broader consultation with ILO Member States in 2006.

D. Cooperation between the Agency and the ILO in Reaching Developing Countries

Action: *ILO to make the list of contact points in its Member States and field structure available to the IAEA, which should inform the contact points about the latest available standards, guidance and advice developed at the international level and invite their representatives to relevant workshops, seminars and conferences*.

10. The ILO has provided the Agency with the details of its contact points, and the Secretariat is keeping these contact points informed.

E. Information Exchange to Promote Greater Awareness and Understanding

Action: *The IAEA, in consultation with ILO, to develop publicity materials in the form of posters and leaflets that target groups of workers identified as likely to benefit directly from the information provided — for example, workplace material designed to reduce the number of near misses and the risk of serious accidents.*

11. Some illustrative material and brochures were obtained from various regional training centres, collaborating training centres and a few national training centres, as well as from members of the Steering Committee on Education and Training in Radiation Protection and Waste Safety. A group of consultants with representation from the ILO and trade unions considered the material and decided on three types of material: posters with illustrations and informatory notes, cartoon-style notices to be displayed on the walls of workplaces, and credit card sized handouts specifically for emergency situations.

Action: *The IAEA to provide a focal point, on a website, where networks may be established for exchanges of information, experience and lessons learned between interested parties.*

12. The Secretariat has initiated a feasibility study to establish, on the Agency website, a portal for access to existing networks. The Secretariat will be organizing a consultancy meeting with representatives of the existing networks to define the information, how to present it and how to ensure sustainability of the system.

F. Education and Awareness

Action: *The IAEA, in consultation with ILO and drawing on the experience of trade unions and other stakeholder organizations, to prepare and disseminate suitable information materials to workers' representatives and labour educators in order to promote a better informed workforce and better understanding generally among those concerned with exposure to radiation.*

13. The Agency has identified existing material that needs to be reviewed in preparation for the development of suitable educational material. This includes practical manuals with illustrations and monographs explaining the basics of radiation protection, and a training package on radiation protection that has been developed and tested for a target audience with secondary level education. A group of consultants with representation from the ILO and trade unions has been identified for the review of this material.

Action: *The IAEA, in consultation with professional medical bodies such as the International Society of Radiology, to critically examine existing postgraduate education and awareness-raising packages for medical professionals, including those now being produced by the ICRP, to establish the need for the development of further material, to develop further material as necessary and to disseminate the material developed.*

14. Training packages under development as part of the International Action Plan for the Radiological Protection of Patients (see Annex 1) are being structured to include training material on occupational protection in diagnostic radiology, nuclear medicine and radiotherapy, as well as a package on radiation protection for cardiologists. The training material is scheduled for completion by the end of 2005.

Action: *The IAEA, together with other cosponsoring organizations, to engage with WHO in establishing the status of the draft Manual [on Radiation Protection in Hospitals and General Practice], and to encourage its finalization, publication and use as soon as possible.*

15. The WHO agreed that the Agency should assume responsibility for finalizing the draft Manual, which was produced in 1999 and needed further updating. The Manual has five volumes, dealing with radiation protection in the following areas:

i. General radiation protection in hospitals
ii. Diagnostic radiology and interventional procedures using X-rays
iii. Dentistry
iv. Nuclear medicine
v. Radiotherapy

The updated drafts are scheduled for completion by the end of 2005.

G. Exposure to enhanced natural radiation in the workplace

16. On the basis of recommendations made at a technical meeting held in May 2001, the Agency had already initiated a programme of work on exposure to natural radiation.

Action: *In support of this programme, the IAEA to assist authorities in identifying activities involving exposure to natural radiation that may need to be controlled, and to generate and disseminate additional sector-specific information on radioactivity levels, exposure conditions, and chemical and physical characteristics of airborne pollutants in workplaces involving naturally occurring radioactive material.*

17. Further work has been conducted on the development of practical guidance to assist Member States in identifying activities involving exposure to natural radiation and their preliminary assessment

in terms of the need for control measures, and the drafting of a Safety Report is scheduled for completion during the course of 2005. Following the completion of guidance material and a training package for the oil and gas sector, attention has turned to three more industry sectors — the phosphate industry, the zircon/zirconia industry, and the titanium dioxide and related industries. For each of these sectors, separate Safety Reports are being drafted and are expected to be complete by the end of 2005.

H. Promotion of a Holistic Approach to Workplace Safety

Action: *The IAEA and ILO to collaborate in devising strategies for achieving a better understanding between radiation protection practitioners on the one hand and occupational health and safety practitioners on the other and for developing coherent approaches to safety in the workplace.*

18. The ILO, which already uses a holistic approach to occupational health and safety, agreed to assume the main responsibility for this action. The ILO and the Agency are exploring appropriate strategies, including the possibility of organizing a meeting or event to share and build upon the experience of practitioners in the field. The ILO efforts to address this action will be guided by its Global Strategy on Occupational Safety and Health, in terms of which the ILO works with its Member States to establish country profiles, leading to the launching of comprehensive (holistic) national occupational health and safety programmes.

I. Formulation and Application of Standards for Protection of Pregnant Workers and their Embryos and Foetuses

Action: *The IAEA to review current information on this issue in order to determine whether the issue warrants action at the international level. In addition to the work described in the presentations made at the Geneva Conference, relevant work has been done in a number of countries and by a number of bodies (such as ICRP).*

19. The Secretariat has assembled the documentation containing the information that needs to be reviewed. This includes existing publications of the ICRP and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), a draft ICRP task group report, a draft standard from the Standards Committee Working Group of the Health Physics Society, and a new recommendation of the German Commission on Radiological Protection (SSK) concerning radiological protection of the unborn child. During the course of 2005, an expert will review this information.

J. Probability of Causation of Occupational Harm Attributable to Radiation Exposure

Action: *The IAEA, in collaboration with ILO, WHO, NEA and other relevant bodies and drawing on the experience of other stakeholders, to continue its work on developing international guidance for aiding decision-making on the attribution of cases of detrimental health effects to occupational exposure to ionizing radiation*.

20. A draft report on attributing radiation-linked diseases to occupational exposure prepared by a group of consultants in 2003 has been circulated to the ILO and WHO Secretariats for comment. The report will also form the working material for a technical meeting at the ILO headquarters in Geneva in early 2006, to which all the relevant bodies and a broad spectrum of international experts are to be invited. The aim of the technical meeting is to draft a document to be published by the Agency and jointly sponsored by the participating international bodies. The ILO has indicated a possible mechanism by which the final publication can be put to various uses within the ILO system as an authoritative source of 'good practice' information and brought to the attention of all its Member States.

Promoting Effective and Sustainable National Regulatory Infrastructures for the Control of Radiation Sources

A. Radiation Safety and Security of Radioactive Sources Infrastructure Appraisal (RaSSIA)

1. RaSSIA, established in 2004, is designed to provide the Agency and the Member State a means for assessing progress and effectiveness in establishing a national regulatory infrastructure for radiation safety and security of radioactive sources. It is based on the requirements of international standards, such as the BSS and IAEA Safety Standards Series publication GS-R-1, the recent guidance provided by the Code of Conduct on the Safety and Security of Radioactive Sources and other Agency publications, such as IAEA-TECDOC-1344, *Categorization of radioactive sources*, and IAEA-TECDOC-1355, *Security of radioactive sources*. The Secretariat is also developing a self-assessment tool to enable Member States to assess their improvements as part of their quality management programme.

2. The primary objectives of RaSSIA are to determine the detailed status of the national regulatory infrastructure for safety and security of radioactive sources; to provide recommendations relating to improvements in areas where shortcomings and deficiencies (against international standards and the Code of Conduct) have been identified; and to submit to the State an action plan for improving the national regulatory infrastructure.

3. As a result of RaSSIA missions carried out in 21 States in 2004 (Azerbaijan, Bahamas, Bahrain, Bolivia, Cambodia, Chad, China, Costa Rica, Cuba, Indonesia, Jamaica, Kazakhstan, Kuwait Lithuania, Malaysia, Morocco, Panama, Philippines, Romania, Syrian Arab Republic and Ukraine) and more than 30 planned in 2005, a comprehensive and effective regulatory control of radiation sources is being enabled through strengthened and focused Agency assistance projects. Their objective is to assist in the establishment of effective national regulatory infrastructures for control of radiation sources through implementation of relevant national action plans.

4. The Secretariat has been establishing and updating Radiation and Waste Safety Infrastructure Profiles (RaWaSIPs) for each Member State receiving Agency assistance. RaWaSIPs are a tool for identifying real needs in Member States and for prioritizing Agency assistance. They are in line with the Country Programme Framework and facilitate the implementation of the Agency's results-based programming. From July 2004 to July 2005, 84 RaWaSIPs were updated and 15 new RaWaSIPs were developed (12 for Member States and three for non-Member States). At the end of July 2005, there were 114 RaWaSIPs.

B. Regulatory Authority Information System (RAIS 3.0)

5. As part of its activities to assist Member States in establishing and operating their national regulatory programme and in particular the national register of radiation sources (one of the main priorities of the TC models projects on upgrading radiation protection infrastructure) the Agency has developed RAIS 3.0, an information management tool for the day-to-day activities of regulatory bodies. The development of RAIS 3.0 was based on experience gained in the field, international standards, such as the BSS and IAEA Safety Standards Series publication GS-R-1, guidance provided by the Code of Conduct on the Safety and Security of Radioactive Sources and guidance related to the export and import of radioactive sources, together with other Agency publications, in particular IAEA-TECDOC-1344 *Categorization of radioactive* sources, and IAEA-TECDOC-1355, *Security of radioactive sources*.

6. The Agency has organized regional workshops on RAIS 3.0 in Arabic, English, French, Russian and Spanish. RAIS 3.0 has also been translated into other languages.

7. At the request of several States, the migration of RAIS 3.0 into SQL Server — a popular data management computer programme — is underway. The SQL version and a Website version will be made available to States by the end of 2005.

C. Training of Regulators

8. Standardized packages have been published for training staff involved in regulatory control over radiation sources. These packages cover control of radiation sources in medical practices (radiotherapy, nuclear medicine and radio-diagnostics) and industrial practices (irradiators, industrial radiography, and nuclear gauges and well logging). A similar package has been developed on control of radiation sources in cyclotron facilities. In addition, a course on radiation safety for custom officers has been developed with the World Customs Organization.

9. English versions of these packages have already been distributed to many Member States and their translation into the other official UN languages has been initiated. In addition, regional workshops have been organized in most regions.

10. The Steering Committee on Education and Training, at its 3rd annual meeting, concluded that significant progress had been achieved in the implementation of the Agency's strategic plan on education and training. The Committee also recommended that the Secretariat give high priority to the assessment of training needs in Member States.

Nuclear and Radiation Safety Networks

A. Asian Nuclear Safety Network (ANSN)

1. Within the framework of the Agency's extrabudgetary programme (EBP) on the safety of nuclear installations in South-East Asian, Pacific and Far East countries, the ANSN entered into operation in 2004. China, Germany, Japan and the Republic of Korea have established Hubs for compiling, analysing and sharing safety knowledge through the ANSN. The Agency provides technical guidance for the development of the network and shares its technical knowledge. National centres have been established by all participating countries as communication portals with the ANSN and focal points for national sharing of safety knowledge. A Steering Committee chaired by Japan coordinates the development of the ANSN.

2. The access policy to the ANSN and a 'single sign-on' process was implemented to easily navigate from one hub or national centre to another with a unique password. A visual identity policy was put in place to better identify the various sites of the ANSN as part of a common project and an ANSN web site: www.ansn.org will be soon established to display general information on the project and to be used as a common portal to the other sites.

3. The topical groups are important components of the ANSN. Three topical groups are currently active on safety analysis of research reactors, education and training and operational safety. Two new topical groups were established to deal with safety standards and safety management of research reactors.

4. Cooperation with the Forum for Nuclear Cooperation in Asia (FNCA) in the field of safety management of research reactors is deemed to be beneficial to both the ANSN and FNCA and will be pursued.

5. Although most of the documents currently available in the ANSN database are education and training-related, other types of documents — such as operational safety documents — are now being added. Many other documents are available through the hubs or national centres.

6. Measures for further promoting the ANSN include a bi-weekly ANSN Newsletter regularly published since mid-March 2005. It is widely distributed in the countries participating in the programme. Promotional meetings are also being organized in participating countries to introduce ANSN to a larger audience, including key decision makers. The first of these was held in Vietnam in March 2005.

7. The ANSN is being increasingly used to support the preparation and implementation of EBP activities and to share results achieved. Before implementing any planned EBP activity, the country/institution receiving assistance prepares background material using existing knowledge from the past activities available in the Asian Programme Management Database and from other relevant knowledge stored in the ANSN.

8. The 2nd ANSN Steering Committee meeting was held in Seoul in May 2005. All the previously mentioned policies and other issues were discussed and formally approved. An action plan for the next few months was also elaborated.

9. The results of the ANSN-related activities to date will be reported at the annual Technical Meeting of the extrabudgetary programme that will take place in Vienna in December 2005.

B. Ibero-American Radiation Safety Network

10. In 2003, with the financial support of Spain, the Secretariat established an extrabudgetary programme on nuclear and radiation safety in the Ibero-American region that is being implemented under the auspices of the Ibero-American Forum of Nuclear Regulators. The programme is based on the Agency's programmatic activities in radiation safety. This provides a solid technical structure and avoids undue duplication. A central element of the programme is the establishment of a radiation safety network to capture and analyse existing and new radiation safety knowledge and disseminate it within Ibero-American countries.

11. Since the establishment of the programme, several meetings of experts from Argentina, Brazil, Chile, Cuba, Mexico and Spain have been held to define the structure of the network. A demonstration system to support the network focused on four thematic areas — application of the Code of Conduct on the Safety and Security of Radioactive Sources, the radiological protection of patients, legal and regulatory infrastructures, and education and training — has been developed in Spain and successfully tested. Also, the information technology structure for a prototype of the network has been developed and the network functionality requirements have been specified. Project managers have been designated for each of the thematic areas, with a mandate to determine how best to share the existing knowledge and experiences in the region using the network infrastructure. A specific project on radiological safety in radiotherapy has been initiated. It includes the development of a probabilistic safety assessment for linear accelerators and recommendations for the safety of radiotherapy installations.

12. In January 2005, the heads of the regulatory bodies of the countries participating in the Forum met in Rio de Janeiro and established a steering committee to coordinate the implementation of the programme. The steering committee oversees the activities leading to the design, commissioning and operation of the Ibero-American Radiation Safety Network. The steering committee will represent the Forum's priorities and policies and will be technically and administratively supported by the Agency.

13. The steering committee has met twice. At the first meeting in Vienna in March 2005, the committee discussed its terms of reference and operational structure and reviewed the progress on the IT solution for the network. The committee also agreed to: develop a detailed proposal for the format and contents of a document that describes the regulatory practices in the countries of the region; establish contacts with the relevant professional societies in the Ibero-American region; and, update the list of contact institutions in the region. A newsletter on the Ibero-American project is also planned.

14. At the second meeting in Buenos Aires in May 2005 the following aspects were further developed: the conceptual structure of the network, including the revision of the taxonomy to reflect the regulatory functions; the knowledge management applications that are required to achieve the objectives of the technical areas; and the IT functionalities of the network, including the topology of the system, the management of users and information resources.

15. A proposed action plan, including collaborative activities by all participating countries, has been drawn up for future work. The participating countries have committed to start making information available to the network, which should be operational by the end of 2005. The action plan includes the development of the IT infrastructure and a series of technical meetings and workshops in the region to further elicit regulatory aspects to be shared in the thematic areas. The progress on the proposed action plan will be discussed at the next meeting of the Forum, scheduled for November 2005 in Havana, Cuba.

C. Radiation Safety Regulators Network (RaSaReN)

16. The Secretariat has established RaSaReN to facilitate the 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. The system supporting the operation of the network is being made available in all official languages and will give access to all activities carried out in the area of regulatory infrastructure for radiation safety and security of radioactive sources, in particular those relating to RaSSIA, RAIS 3.0 and the training of regulators.

17. Access to RaSaReN is gradually being made available to States through licences provided free of charge (TC and extra-budgetary funds).

18. Through RaSaReN, Member States may download RAIS 3.0 (in any official UN language), training materials, and any documentation relating to RaSSIA. In addition, the system supports regional and interregional forums on different subjects using all UN official languages.

D. Looking ahead

19. The results achieved to date in connection with the Asian Nuclear Safety Network and the Ibero-American Radiation Safety Network are encouraging. This suggests that networks, subject to the interest of other States, could be pursued in other regions too and ultimately all the regional networks could be interconnected in a global network for generating and sharing nuclear and radiation safety knowledge.

Implementation of the International Action Plan on the Safety of Radioactive Waste Management

1. The background for the International Action Plan on the Safety of Radioactive Waste Management is available in Annex 9 of GOV/INF/2004/10-GC(48)/INF/7.

Action 1: *Develop a common framework for the management and disposal of different types of radioactive waste, paying particular attention to large volumes of waste containing long-lived naturally occurring radionuclides.*

2. The draft common framework document has been further refined and at the 2004 Córdoba International Symposium on Disposal of Low Activity Radioactive Waste, a number of issues emerged. One significant issue is the need for clarity and coherence of terminology and concepts, both to facilitate exchange of information at an international level and to assist Member States with the development of comprehensive waste management strategies. The meeting urged the Secretariat to commence work on the revision of the Safety Standard on radioactive waste classification to address these issues. The Secretariat has compiled a document preparation profile for the revised standard for approval by the safety standards committees and commission and ideas from the common framework document have been used to structure proposals for a revised radioactive waste classification scheme. Once these have been approved, the terminology proposed will be adopted in further drafts of the common framework prior to its publication.

Action 2: *Assess the safety implications of the extended storage of radioactive waste and of any future reconditioning which may be necessary and develop safety standards for the long-term storage of radioactive waste.*

3. The draft Safety Guide on the storage of radioactive waste has been reviewed by Member States and has been revised on the basis of comments received. The revised guide has been structured in two main sections. The first deals with operational and short to medium term storage of operational waste arising mainly from nuclear fuel cycle facilities. The second deals with facilities and activities generating small amounts of radioactive waste. The Commission on Safety Standards (CSS) will consider this guide at its November 2005 meeting.

4. The Agency published a Position Paper prepared by international experts entitled *The long-term storage of radioactive waste: safety and sustainability* in 2003. The document, which reviews the ethical and philosophical issues surrounding the extended storage of radioactive waste, is intended as an international reference point for discussions on the subject and as an aid to Member States in taking decisions on the long-term management of radioactive waste. It identified increasing difficulties with proving safety assurance for longer storage periods and concluded that indefinite storage was not a sustainable option from a safety perspective. In order to provide a linkage between the draft Safety Guide on storage and these longer-term issues, work has commenced on the development of a safety report on this topic. The report will attempt to harmonize terminology relating to storage periods (such as short, medium, extended, long term etc.) and purposes (such as operational buffer, pending transfer, radioactive decay, awaiting availability of disposal facility etc.) and identify the associated safety and licensing issues. This report could form the basis for a safety guide dealing with these longer time frames.

5. An international project on the safety assessment of waste management prior to disposal commenced towards the end of 2004, one component of the project being the safety assessment of long-term storage. The project is exploring harmonized approaches to safety assessment, appropriate methodologies and testing their application in different circumstances. The project is also addressing regulatory review of such safety assessments.

Action 3: *Promptly develop safety standards for geological disposal, addressing, inter alia, issues of human intrusion, institutional control, retrievability, the content of the safety case and any implications of nuclear safeguards requirements for the design of the repositories*.

6. A draft Safety Requirements document on geological disposal has been prepared, with OECD/NEA as a co-sponsor. The draft was reviewed by Member States in 2003 and in 2004 the Secretariat revised the document to take account of the comments received. The Waste Safety Standards Committee (WASSC), the Radiation Safety Standards Committee (RASSC) and the Radioactive Waste Management Committee of OECD/NEA have all approved the standard, as have the CSS and the OECD/NEA's Steering Committee. The standard has been submitted for consideration by the Board of Governors at its September 2005 meeting.

7. Work is continuing on a supporting safety guide which will elaborate on the safety considerations involved in: disposal facility site investigation, characterization and selection; facility design and development; and facility operation and closure. The safety guide will also elaborate on the requirements for a safety case specified in the Safety Requirements and on the need to demonstrate that any measures facilitating retrievability will not have an adverse impact on safety.

8. The Secretariat is liaising with a group of European countries that are presently involved with or considering the development of geological disposal facilities. The group of countries is exploring approaches to demonstrating the safety of geological disposal facilities.

Action 4: *Develop an internationally accepted and harmonized approach for controlling the removal of materials and sites from regulatory control*.

9. IAEA Safety Guide RS-G-1.7, *Application of the Concepts of Exclusion, Exemption and Clearance*, was published in 2004 and safety guides relating to the removal of materials and sites from regulatory control are being developed. Complementary safety reports are also under development, one on monitoring for compliance with clearance criteria and one on the removal of sites from regulatory control and both of these documents are scheduled for publication in 2005.

Action 5: *Develop a structured and systematic programme to ensure adequate application of the Agency's waste safety standards and facilitate their application in implementation of the Joint Convention*.

10. Three documents have been developed to assist with appraisals of the use and effectiveness of the Agency's radioactive waste safety standards. These documents are based on the questionnaires previously developed from the safety standards. One document has been developed for use in appraising the overall waste safety programme within a country. It is focused on the elements of legal and regulatory infrastructure necessary to provide for an adequate radioactive waste safety regime. The second document is a compendium of questionnaires derived from the various waste safety standards. The document can be used to structure and carry out a detailed appraisal of any waste management facility or activity. The third document is for use with the Joint Convention on the Safety

of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) in compiling national reports. It provides a linkage between the various articles of the Joint Convention and the safety standards and can be used by Member Sates wishing to use the waste safety standards as a point of reference for the Joint Convention.

11. The radioactive waste safety appraisal services offered by the Agency are currently being revised to provide a comprehensive but flexible service to Member States in the areas of waste management and disposal, radioactive discharge control and decommissioning. The service will be provided at the request of Member States and is being designed to meet any particular needs of Member Sates ranging from peer review of discrete facilities or activities to overall national waste management strategies or programmes.

Action 6: *Explore ways to ensure that information, knowledge and skills concerning radioactive waste management are made available to future generations.*

12. A draft document has been prepared on the preservation and transfer of information to future generations about the safety of radioactive waste disposal facilities. It has been reviewed at a technical meeting and is being revised by the Secretariat in the light of comments made there. It discusses the importance of information transfer to future generations as a basis for their informed decision making, and emphasizes the need to maintain the contextual information — as well as the information itself — relating to the safety of facilities. It also discusses information networks as the key to convey information successfully to the future. The document will be published towards the end of 2005.

Action 7: *Address the broader societal dimensions of radioactive waste management by: disseminating information, in appropriate formats and by appropriate means (including the Internet), on the main issues related to radioactive waste management; disseminating information on lessons learned from national experiences of stakeholder involvement in decision-making; involving concerned persons in relevant Agency activities, especially those related to the Agency's safety standards; and ensuring that the societal aspects of radioactive waste management are adequately covered at relevant conferences and other meetings organized by the Agency.*

13. The use of underground research facilities for training and demonstration of disposal technologies is essential for confidence building and public acceptance of geological repositories. Through technical cooperation projects, coordinated research projects, and support and extra-budgetary funding from several Member States, the Agency has established a network of centres of excellence for training and building capacity on geological disposal technologies in Member States with less developed high level waste management programmes.

14. The idea of inviting a broad range of stakeholders to attend meetings of WASSC as observers has been considered and a joint meeting with the International Radioactive Waste Technical Committee (WATEC) has taken place. The joint meeting served to give the broader waste management community and technical support functions better insight into the radioactive waste safety standards development process.

15. The Agency will hold the International Conference on the Safety of Radioactive Waste Disposal in Tokyo in October 2005. The Conference will cover all radioactive waste types and all disposal options. It will cover the global waste safety regime including the Joint Convention and the international waste safety standards. Sessions will be held on assessing and demonstrating the safety of the different disposal options and on the licensing of these facilities and regulatory review of the safety cases and supporting safety assessment. A session in the conference will be devoted to

communicating the safety of radioactive waste disposal facilities, which will feature country experiences in stakeholder involvement and dialogue.

Action 8: *Review the new developments related to policies for the control of radioactive discharges to the environment, taking into account the availability and cost-effectiveness of discharge reduction technologies and the broader implications for radioactive waste management of reducing discharges.*

16. The Plan of Activities on the Radiation Protection of the Environment — submitted to the Board of Governors for approval at its September 2005 session — encompasses coordination of actions of the international organizations involved (i.e. UNSCEAR, ICRP, International Union of Radioecology, IAEA, NEA and European Commission) and information exchange policy as well as review, possible revision and application of relevant IAEA Safety Standards.

Action 9: *Explore international mechanisms for facilitating the management of spent sealed radioactive sources through: the return of such sources to their suppliers; the development of regional repositories for the disposal of such sources; and, studies on the feasibility and safety of the borehole disposal concept.*

17. A safety guide covering the design and operation of borehole disposal facilities is being developed. At the March 2004 WASSC meeting, it was agreed that the safety guide should focus on intermediate-depth narrow-diameter boreholes intended primarily for the disposal of disused sealed sources. The draft was developed accordingly and circulated for Member State comments. The revised document, taking Member State comments into consideration, will be discussed at the October 2005 WASSC meeting.

18. A complementary safety report on the generic safety assessment of borehole disposal facilities is also being developed. The borehole disposal concept offers good prospects for safe and cost effective disposal of disused sealed sources. This would be of considerable benefit to many Member States who do not generate significant quantities of radioactive waste. Nevertheless whilst the concept entails relatively straightforward technology, safety demonstration remains complex. Generic safety assessments, based on standardized designs and appropriate meteorological, hydro-geological and geochemical conditions, could be used to construct a site-specific safety case with the commensurate amount of site information necessary for the prevailing circumstances. The approach adopted and methodology selected for conduct of the assessment and its proposed application are undergoing extensive peer review in order to gain a high level of confidence in the safety report.

19. A regional project in Africa is currently underway to assess the technical feasibility of borehole technology for the disposal of disused radioactive sources. Related activities are underway to implement the borehole disposal concept for the management of radioactive sources in other regions.

Implementation of the International Action Plan on Decommissioning of Nuclear Facilities

1. The background for the International Action Plan on Decommissioning of Nuclear Facilities is available in Annex 10 of GOV/INF/2004/10-GC(48)/INF/7.

Action 1: *Develop a database and related information documents on the worldwide status of nuclear facility decommissioning to include facilities a) currently undergoing decommissioning and b) those that can be expected to be decommissioned in the future, using all currently available information including that from other international organizations.*

2. The Agency has published an information document entitled *Status of the Decommissioning of Nuclear Facilities around the World* that summarizes the status of decommissioning activities worldwide and provides an assessment of the future potential liability associated with the decommissioning of current facilities.

3. A database has been developed incorporating detailed information from research reactor decommissioning projects. Extension of the Power Reactor Information System (PRIS) to include NPPs that have been shutdown is available on-line for submission of data by Member States.

Action 2: *Prepare a Safety Requirements document that establishes the basic safety requirements for the planning and implementation of all types of decommissioning activities and revise and update the existing supporting Safety Guides.*

4. Safety Requirements on the Decommissioning of Nuclear Facilities have been prepared and sent to Member States for comment. The document will be presented to the Agency safety standards committees in October and November 2005.

5. The process for updating the existing Safety Guides (*Decommissioning of Nuclear Power Plants and Research Reactors* (WS-G-2.1), *Decommissioning of Medical, Industrial and Research Facilities* (WS-G-2.2) and *Decommissioning of Nuclear Fuel Cycle Facilities* (WS-G-2.4)) will begin once the safety standards committees have approved the Safety Requirements.

Action 3: *Establish a forum for the sharing and exchange of national information and experience on the application of safety assessment in the context of decommissioning and provide a means to convey this information to other interested parties, also drawing on the work of other international organizations in this area.*

6. A three-year international project on the evaluation and demonstration of safety of decommissioning of nuclear facilities began in October 2004. The objective of this project is to develop a harmonized methodology for evaluating safety implications of decommissioning activities and identifying possible mitigation actions. One of the outcomes of this project is a set of documents that will assist Member States to perform safety assessments for various nuclear facilities, using a graded approach.

Action 4: *Upon request by Member States, provide advice and assistance on the decommissioning of research reactors on their territory by: developing technical reports and documents on the options for decommissioning, for fuel storage and disposal, and for the management of residual buildings and*

material in the context of countries with limited resources and nuclear infrastructures; and establishing a demonstration project on research reactor decommissioning to serve as a basis for information exchange and training.

7. A Safety Report has been drafted that provides information to assist Member States in selecting a suitable decommissioning strategy based on a number of key factors that must be considered during the selection process. This document is in the preliminary stages of development. A preliminary draft Technical Document on the decommissioning of research reactors and other small nuclear facilities by making optimal use of limited resources has been prepared.

8. Terms of reference have been developed for the project on research reactor decommissioning and a possible Member State has been identified. Further negotiations are needed with the Member State before the project can begin. Funding has not been provided for the implementation of this project.

Action 5: *Develop international guidance on the safety conditions which must be complied with if the entombment option for the decommissioning of research reactors were to be implemented*.

9. This action has been included in the Safety Report being developed in response to Action 4. Also, the Safety Guide concerning decommissioning of nuclear reactors and research reactors (WS-G-2.1) will include guidance on this subject when updated.

Action 6: *Review in a Safety Report and technical documents the options for the management and disposal of the radioactive waste from decommissioning activities, taking account of the special technical and safety problems associated with large volumes of low activity waste or waste with particular characteristics such as graphite containing long-lived radionuclides or tritium-bearing waste*.

10. A Safety Report has been drafted concerning the safety issues associated with the various waste streams that will be produced from the decommissioning activities. A technical report on the characteristics and management of specific decommissioning waste has been developed and is in the process of publication.

Action 7: *Organize an international conference in 2006 on improving safety and efficiency through the lessons learned from experience in the decommissioning of nuclear facilities. The conference should include experiences from the decommissioning of all types of nuclear facilities and should address planning and operational strategies, effective technologies and measurement techniques, regulatory and management approaches, radioactive waste management, funding and societal aspects*.

11. The Government of Greece has agreed to host the International Conference on Lessons Learned from Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities, which will be held in Athens in October 2006. A programme committee has been formed and the call for papers and a tentative programme have been developed.

Action 8: *Collect and summarize in a technical document Member States' experience in providing funding for ensuring that decommissioning can be implemented when needed.*

12. A technical document has been drafted and will be published in 2005.

Action 9: *Provide for the exchange of information on Member States experiences in the re-use of decommissioned sites, including consideration of the opportunities, the economic aspects and the associated technical issues, and publish a technical report on the subject.*

13. A technical report has been developed and approved for publication.

Action 10: *Summarize the information that is needed to ensure the safe decommissioning of nuclear facilities when there are delays between shutdown and the implementation of the final decommissioning activities and experiences of means for assuring that information relevant to decommissioning remains available in the long term and publish in technical documents.*

14. A preliminary draft has been prepared and is now under review.

Action 11: *Address the societal aspects of decommissioning by summarizing in information documents: a) national experiences worldwide of stakeholders' involvement in decision-making in relation to decommissioning, and b) experiences of social issues related to the shutdown and decommissioning of nuclear facilities, taking due account of the work of other international organization*s.

15. This activity will begin once some of the other actions are complete.

Transport Safety

A. The Agency's Transport Regulations

1. The Secretariat has issued the 2005 Edition of the *Regulations for the Safe Transport of Radioactive Material* (the Transport Regulations) which were approved by the Board of Governors in November 2004.

2. In June 2005, the Board of Governors approved a policy for reviewing and revising the Agency's *Regulations for the Safe Transport of Radioactive Material*. Under this policy, the Transport Regulations will be reviewed every two years (the current review cycle of the relevant international bodies), the decision on the revision and publication will be made based on the assessments of the Transport Safety Standards Committee (TRANSSC) and CSS.

B. TranSAS missions

3. In 2004, the Secretary General of the Nuclear Safety Commission of Japan requested that the Agency conduct a TranSAS mission to Japan. The mission is scheduled for December 2005.

C. Compliance Assurance and Quality Assurance

4. The Secretariat has made available for Member State comments a draft copy of the proposed Safety Guide TS-G-1.3, entitled *Management Systems for the Safe Transport of Radioactive Material*. This Safety Guide applies to management systems for all activities related to transport of radioactive material including, but not limited to, design, fabrication, assembly, inspection, test, maintenance, repair, modification, use, procurement, handling, shipping, storage, cleaning, and disposal of radioactive material packaging. A new Safety Guide on compliance assurance has been initiated with an anticipated completion date in late 2006.

D. Radiation Protection Programmes

5. The Secretariat has made available for Member State comments a draft copy of the proposed Safety Guide TS-G-1.5, *Radiation Protection Programmes in the Transport of Radioactive Material*. This Safety Guide will provide the necessary guidance to consignors and carriers in developing programmes that meet the regulatory requirements.

E. Education and Training

6. The Secretariat held a transport safety training course for Latin America in Lima, Peru in June 2005, and plans to hold another in Europe in 2006. Thereafter, subject to the availability of financial resources, the Secretariat plans to hold a training course on transport safety in Africa, Asia and the Pacific, Europe and Latin America regions every two or three years.

F. Events in the Transport of Radioactive Material (EVTRAM) Database

7. The Secretariat continues to collect the contact details of the persons authorized to submit, on behalf of their governments, information on transport events for inclusion in the EVTRAM database. To date only 38 Member States have provided the requested information. The Secretariat continues to work with Member State contact points to obtain information for the EVTRAM database and encourages all Member States to use the data input programme developed with the assistance of the Swedish Government and available at www.amckonsult.se. The Secretariat will evaluate the data once a sufficient number of responses has been received.

G. Seminar on Complex Technical Issues

8. The Secretariat will conduct a seminar in October 2005 on complex technical issues related to the safety of transport. Some of the issues that will be discussed are the physical testing of spent fuel casks, technical evaluations and emergency preparedness and response.

H. Maintaining Dialogue and Consultation

9. In July 2005, a group of eight coastal and shipping States had informal discussions in Vienna. The Secretariat was invited and represented at the meeting.

Safety and Security of Radioactive Sources

A. Code of Conduct on the Safety and Security of Radioactive Sources (the Code) and its Guidance on the Import and Export of Radioactive Sources

1. As of the end of June 2005, 73 States had made political commitments with respect to the Code, and four States had formally written to the Director General indicating their commitment to follow the Code's supplementary guidance on the import and export of radioactive sources. The Secretariat is organizing regional workshops to further encourage States to implement the Code.

B. Categorization of Radioactive Sources

2. The categorization of radioactive sources, which provides the basis for the scope of the Code and the supplementary import/export guidance, has now been formally incorporated into the IAEA Safety Standards Series as Safety Guide RS-G-1.9.

C. Securing and Managing Radioactive Sources

C.1. The IAEA/Russian Federation/USA ("Tripartite") Initiative

3. Under this initiative, since the beginning of 2003 the Agency has been managing the projects for the dismantling of disused sources and facilities (teletherapy machines, irradiators etc) and the transport of sources to secure storage. Projects have been completed in Azerbaijan, Estonia, Republic of Moldova and Tajikistan. Projects are underway in Armenia, Belarus and Kazakhstan and these will be completed by the end of 2005. The USA, and recently Canada, are providing the funding for the work. Hungary has also made financial and in-kind contributions to dismantle sources in Republic of Moldova and prepare them for transport to Hungary for re-use.

4. At its meeting on 18 May 2005, the Initiative's Steering Committee decided to change the structure of the Initiative to a regional partnership between the United States Department of Energy and the Federal Atomic Energy Agency of the Russian Federation with the Agency as a facilitator.

C.2. Assistance to recover orphan or vulnerable sources

5. Direct assistance was provided to nine Member States to recover gamma emitting orphaned and disused sources and condition them for either long-term storage or transport for repatriation to suppliers. High activity sources from Bolivia, Colombia, Haiti, Panama and the United Republic of Tanzania were recovered and conditioned in 2004 and 2005.

6. The Agency has completed and tested conditioning procedures for neutron sources. This has led to the recovery of 55 sources from Côte d'Ivoire, South Africa, Sudan, and Uruguay in 2004 and 2005.

7. The development of mobile facilities to deal with various types of sealed radioactive sources and render them safe and secure is underway. The availability of such facilities, together with international experts, will make the processing of high risk sources possible in every Member State.

8. Since September 2004, the Agency has assisted Azerbaijan, Croatia, Kazakhstan, Kyrgyzstan, Republic of Moldova and Tajikistan, in developing national strategies to search, locate and recover orphan sources, in setting up search teams and in implementing search campaigns.

D. New radiation warning sign

9. The Agency has been leading the development of a new international radiation warning sign for dangerous sources for several years and five of the proposed signs were recently tested in 11 countries to determine which sign best conveys the message of 'Danger - Run Away - Do Not Touch'. The objective is to supplement the current trefoil symbol, which is only intended as an information sign. The results of a survey by the Gallup Organization in the 11 countries will be presented to the International Organization for Standardization (ISO), with the objective of establishing an international standard on the new radiation warning sign in June 2006.

E. The International Conference on the Safety and Security of Radioactive Sources: Towards a Global System for the Continuous Control of Sources throughout their Life Cycle

10. This Conference was organized by the Agency in cooperation with other international organizations and hosted by the Government of France in Bordeaux from 27 June to 1 July 2005. It was attended by about 300 participants from 64 member States. The Conference President's findings are available on the Agency's web site:

http://www-pub.iaea.org/MTCD/Meetings/PDFplus/2005/cn134-findings.pdf

11. The Conference acknowledged that the completion and subsequent endorsement of the Code of Conduct on the Safety and Security of Radioactive Sources represented a major achievement. The Conference encouraged all Member States to continue to work towards implementing the Code's guidance. It also encouraged the Agency to take account of the Code in the review and eventual revision of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources.

12. The Conference encouraged the Secretariat to undertake consultations with Member States with a view to establishing a formalized process for a periodic exchange of information and lessons learned and evaluation of progress made by Member States towards implementing the provisions of the Code.

13. The Conference recognized that safety and security are an integral part of effective and comprehensive regulatory structures for ensuring the continuous control of radioactive sources

throughout their life cycle and noted that an adequate balance between confidentiality and information exchange must be struck to ensure the safety and security of radioactive sources.

14. The Conference also noted that many national and multi-national efforts are taking place to regain and maintain control of vulnerable and orphan sources. There were also discussions regarding the continuing need to prevent illicit trafficking in and inadvertent movements of radioactive sources. Finally, the Conference noted that the effective management of radiological emergencies involving radioactive sources needs to be an integral part of national strategies for the safety and security of radioactive sources.

15. The findings will be taken into account in the implementation of the Action Plan for the Safety and Security of Radioactive Sources.

F. The International Catalogue for sealed radioactive sources and devices

16. The Agency is developing the International Catalogue, a database which contains data on sealed sources, devices used for the applications of sealed sources, and manufacturers and suppliers. Currently, there are over 12 000 data on various source and device models. The database is expected to be available to Member States via the Internet in September 2005. The Secretariat has requested Member States to nominate national coordinators to make this information available to interested national organizations, such as regulatory bodies, waste operators and customs agencies. Interpol, Europol and the World Customs Organization are also interested in using the catalogue and have been invited to nominate counterparts.

The Agency's Incident and Emergency Response System

A. Incident and Emergency Centre (IEC)

1. In February 2005, the Director General approved the establishment of the IEC, which is intended to serve as a unified and coordinated incident and emergency response system that represents a more visible and accessible focal point for Member States for the reporting of and, if necessary, the prompt, coordinated response to events, and exchange of information relating to preparedness and response. The IEC incorporates the functions of the former Emergency Response Centre and incident reporting systems, such as the International Nuclear Event Scale (INES) and the Nuclear Events Web-based System (NEWS), and now extends to coordinating prompt assistance to requesting States in the case of a nuclear security incident; and providing coordinated technical support in the case of an event of safety or security interest to the media.

B. Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

2. At the 3rd Meeting of the representatives of competent authorities identified 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, held from 12 to 15 July 2005, participants reviewed progress achieved since the last meeting, discussed and approved proposals relating to strategies for enhancing international assistance and communication in the event of a nuclear accident or radiological emergency, and reviewed the evaluation of the international Convention Exercise-3 (ConvEx-3)(2005). Participants also agreed on a proposal for enhancing the existing drill and exercise regime and encouraged competent authorities to initiate a request to develop a code of conduct for the international emergency management system.

3. The meeting report is available at: http://www-ns.iaea.org/downloads/meetings/caenac2005.pdf.