

General Conference

GC(49)/OR.7

Issued: February 2006

General Distribution

Original: English

Forty-Ninth (2005) Regular Session

Plenary

Record of the Seventh Meeting

Held at the Austria Center Vienna on Thursday, 29 September 2005, at 10.10 a.m.

President: Mr. BAZOBERRY (Bolivia)

Later: Mr. SKOKNIC (Chile)

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¹ GC(49)/20.

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Abbreviations used in this record:

AFRA	African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology
ARCAL	Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean
ASEAN	Association of Southeast Asian Nations
Assistance Convention	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
CPF	Country Programme Framework
CPPNM	Convention on the Physical Protection of Nuclear Material
CTBT	Comprehensive Nuclear-Test-Ban Treaty
DPRK	Democratic People's Republic of Korea
E3/EU	France, Germany and the United Kingdom, with the support of the High Representative of the European Union
Early Notification Convention	Convention on Early Notification of a Nuclear Accident
EU	European Union
Euratom	European Atomic Energy Community
G7	Group of Seven
ITER	International Thermonuclear Experimental Reactor
Joint Convention	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
MESA	Middle East and South Asia
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NPT Review Conference	Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons
PACT	Programme of Action for Cancer Therapy
RCA	Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (for Asia and the Pacific)
SEAP	South East Asia and the Pacific
SQP	small quantities protocol

* Speakers under Rule 50 of the Provisional Rules of Procedure are indicated by an asterisk.

8. General debate and Annual Report for 2004 (continued) (GC(49)/5)

1. Mr. NIEUWENHUYS (Belgium) said that recent years had been marked by major challenges to the non-proliferation regime which demonstrated the importance of the role played by the Agency in verifying compliance with the NPT. His country had shown full support for universality of the NPT and for the implementation of all its provisions, whether they related to non-proliferation and disarmament or to access to nuclear energy for peaceful purposes. He regretted that the 2005 NPT Review Conference had been unable to achieve a substantive final document, and was disappointed that the very real challenges concerning non-proliferation and arms control had not been broached in the final document of the United Nations World Summit of September 2005. In the name of the efficient multilateralism that his country promoted, the Agency's authority in its areas of competence should be confirmed.
2. The Agency's safeguards system was an essential tool in preventing nuclear proliferation. Belgium urged States party to the NPT that had not yet done so to conclude with the Agency and implement safeguards agreements, as they were obliged to do by joining the NPT. The Board of Governors had adopted the Model Additional Protocol more than eight years previously, but it was still not applicable in a large number of States. For the Belgian Government, comprehensive safeguards agreements and additional protocols constituted the current verification standard.
3. Belgium welcomed the decision² taken by the Board of Governors on the issue of SQPs, which promised to overcome a weakness in the current safeguards system. Belgium called on all States having such an agreement with the Agency to proceed to an exchange of letters with the Director General so as to implement the standardized text and modified criteria.
4. Belgium looked forward to the upcoming first meeting of the Advisory Committee on Safeguards and Verification within the Framework of the IAEA Statute and would participate actively and constructively in the work of the Committee, which he trusted would help the Board of Governors to respond to challenges related to verifying nuclear non-proliferation and take into account in a realistic manner the needs to be met, the progress already made and the work which remained to be done.
5. With regard to the expert group report on Multilateral Approaches to the Nuclear Fuel Cycle reproduced in document INFCIRC/640, the Belgian Government believed that further discussions open to all States concerned should consider how such approaches could contribute effectively to strengthening the international nuclear non-proliferation regime.
6. Non-traditional security problems, the most prominent of which was international terrorism, had increased in number over the preceding years. The threat of nuclear terrorism required an adequate response. In that context, Belgium welcomed the unanimous adoption by the United Nations General Assembly of the International Convention for the Suppression of Acts of Nuclear Terrorism and was preparing its ratification.

² See GOV/OR.1137, paras 30–42.

7. Belgium had participated in a constructive way in the amendment of the CPPNM. The Government would submit the amendment to Parliament for ratification as soon as possible and would establish the necessary legal and regulatory frameworks. The amended Convention would make an important contribution to the fight against terrorism and the prevention of nuclear proliferation.

8. With regard to the problems posed by the DPRK's nuclear ambitions, Belgium welcomed the joint statement made on 19 September 2005 by the participants in the six-party talks and the progress that had been achieved already. The implementation of all the measures announced would contribute to normalizing the DPRK's status within the Agency and beyond. China's key role in the progress was appreciated.

9. Nuclear developments in Iran continued to be a concern and the Agency's operational and specific work in that area remained essential. Belgium believed that the principal merit of the resolution³ adopted by the Board of Governors on 24 September 2005 was that it confirmed the Agency's authority in that regard. Belgium called on all Member States to support the resolution, and on Iran to take the opportunity to respond favourably to the appeals made by the international community through that Board resolution and others. A return to full suspension of all enrichment-related activities, including conversion and processing, was required as an essential confidence-building measure, and long-term arrangements needed to be sought. Belgium wished to underline the importance, broad scope and progressive nature of the proposals that had been made to Iran through the efforts of the European Union, and it called on Iran to resume dialogue and negotiations as foreseen in the Paris Agreement⁴.

10. Iran's compliance with its international safeguards obligations concerned all members of the Agency equally. The content of the Director General's last report⁵ on the matter left Member States with shared responsibilities. Was not the central issue of the debate in the Board of Governors how to contribute to the honouring of commitments when trust in the willingness to honour them had been compromised? The importance of that issue was obvious. The international community must therefore be able to act in the matter on the political and legal levels.

11. The development of peaceful uses of the atom implied for each State the absolute obligation to protect its people and the environment from ionizing radiation and radioactive contamination risks. The Nuclear Safety Convention, the Joint Convention and the Agency's safety standards contributed greatly to the development of a safety culture everywhere in the world, to the improvement of safety in nuclear installations and to the maintenance of that safety at a high level.

12. The Belgian Nuclear Research Centre was continuing its nuclear safety related activities and its work on the sustainable use of nuclear energy. Several contracts and agreements for international collaboration had been signed.

13. The research and development programme, principally the BR2 reactor and the HADES underground research facility, had been operating successfully. Attention had been given to research into transmutation by an accelerator-driven subcritical system — the MYRRHA project.

14. The integration of social aspects, as well as the participation of citizens in making decisions related to nuclear matters, were being examined in close collaboration with universities and concerned parties.

³ GOV/2005/77.

⁴ See INFCIRC/637.

⁵ GOV/2005/67.

15. Since the previous session of the General Conference the Belgian Nuclear Research Centre had been designated by the Agency as a collaborating centre. Belgium much appreciated the recognition of the Centre's contribution to the Agency's programme.

16. Nuclear technology helped to save thousands of lives daily, through medical diagnoses and treatment. It also provided a basis for industrial applications, improving the quality and reliability of products and services and contributing to the sustainable development and prosperity of humanity. Industrial isotopes occupied an essential niche in modern technology. Belgium was a major producer of radioisotopes for medical and industrial uses. The decreasing number of research reactors available to produce isotopes was a cause for concern. In order to guarantee the future benefits for society of medical and industrial radioisotopes, Belgium was looking at the potential of a regional approach for the production and supply of radioisotopes in a multilateral or international context.

17. Mr. ABDOULAH (Niger) said that his country had recently established a Directorate for the Peaceful Use of Nuclear Technology under the Ministry of Mines and Energy, thereby reaffirming its complete commitment to the Agency's goals and objectives and demonstrating its willingness to participate actively in the peaceful use of nuclear technologies and in the strengthening of the international legal framework.

18. His country was committed to working in solidarity with the entire international community to establish peace, security and prosperity in the world. In that context, his Government had initiated the process for ratification of the Early Notification Convention and the Assistance Convention and acceptance of the amendment to the CPPNM adopted on 8 July 2005 in Vienna. With a view to strengthening the national legal framework, steps to accelerate Niger's ratification of the Joint Convention had also been taken.

19. Niger appreciated the Agency's active role in facilitating development through nuclear applications in the fields of energy, agriculture and stockbreeding, human and animal health, water resource management, the environment, and others. It welcomed the results obtained through the technical cooperation programme.

20. Under its new CPF (2003-2007), Niger had opted to implement cooperation activities related to the national anti-poverty strategy, the principal areas of which were education, health, water and sanitation, population policy and human and technical capacity-building. Niger was very glad that the Agency had responded favourably to the requests it had submitted, establishing six national projects in line with the country's priority needs. It hoped that the new project ideas it was submitting for the 2007-2008 programme cycle would also be approved.

21. Wishing to put in place the social, economic and environmental conditions for the development of a national health system and in view of the rapidly rising incidence of cancer in Niger, the Government had made plans to establish a national radiotherapy capacity for cancer treatment by setting up a National Radiotherapy Centre at Niamey which would provide curative and palliative treatment for all radiosensitive cancers, particularly those found in women, and thus improve patients' quality of life. The feasibility study had been completed, but the establishment of the national capacity still required the support of sponsors, for which he launched a solemn appeal.

22. Niger attached particular importance to the Agency's activities in the areas of radiation safety and waste management, especially to the management of mining waste. Niger was committed to improving the human health and environmental aspects of its mining sector. It was also interested in sustainable energy development, specifically energy planning and evaluation of environmental impacts.

23. Niger appreciated the regional programme against desertification but would wish it to receive greater attention and particularly more financing so that Member States could take full advantage of it.

24. Niger welcomed the Agency's considerable support for sustainable development, notably through its technical cooperation programme, and the assistance provided through its regional and subregional programmes. It approved of the third extension of AFRA for 2005–2010 and intended to participate more fully in its activities.

25. His country wished to revitalize its national infrastructure by strengthening the Directorate for the Peaceful Use of Nuclear Technology and the National Radiation Protection Centre to allow peaceful applications of nuclear technology to be used in a safe framework.

26. Mr. RÓNAKY (Hungary), after welcoming Belize as a new Member State, said his country was seriously concerned about the alarming proliferation trends which were putting the multilateral nuclear non-proliferation regime to the test. The compliance challenges of recent years threatened the integrity of the NPT as the cornerstone of the regime. Hungary's efforts on its own and together with its partners in the framework of the EU Strategy against the Proliferation of Weapons of Mass Destruction were aimed at upholding the NPT's authority. Hungary deeply regretted that the 2005 NPT Review Conference had failed to adopt a substantive final document setting out measures to meet the new challenges.

27. Against the background of intense international concerns about nuclear weapons proliferation, Hungary attributed great importance to the strengthening of the Agency's safeguards system. During its past two years of service on the Board of Governors, Hungary had advocated equipping the Agency with new tools that would enable it to carry out its verification activities more effectively. Hungary believed that the additional protocol represented the current verification standard and was ready to promote its universalization.

28. The adoption of the modified SQP paved the way for the elimination of a major weakness in the Agency's safeguards system. Hungary was also ready to contribute actively to other initiatives, including the creation of the Advisory Committee on Safeguards and Verification, and it welcomed the Agency's widening application of integrated safeguards. It had been among the first countries with major nuclear industries to start applying the new system, which had been officially introduced on 15 November 2004, making Hungary the first Member State of the EU where the new inspection regime had entered into force. It had shared its experience in that field with experts from 12 EU Member States during a three-day workshop in Budapest organized by the Agency and the Hungarian Atomic Energy Authority.

29. Hungary welcomed the joint statement issued at the end of the fourth round of the six-party talks in which the DPRK had committed itself to abandon all nuclear weapons programmes. That represented a major positive development in the years-long pursuit of the Korean Peninsula's denuclearization. He hoped that all parties would expeditiously proceed to honour their commitments under the agreement.

30. Hungary was seriously concerned that Iran's policy of concealment over an extended period had resulted in non-compliance with its obligations under its NPT safeguards agreement. It strongly supported the steps envisaged in the recent Board of Governors resolution (GOV/2005/77), which it believed would facilitate further diplomatic efforts to re-establish international confidence in the peaceful character of Iran's nuclear programme. It called on Iran to abide by that and all previous relevant Board resolutions, to reverse its decision to resume uranium conversion, and to return to negotiations with the E3/EU in the framework established by the Paris Agreement.

31. In the aftermath of terrorist attacks in different regions of the world, the physical protection of nuclear material and facilities had become a high priority. The Agency played an important role in coordinating international efforts in that field and helping Member States to meet the highest standards of physical protection.

32. The recent diplomatic conference which had successfully amended the CPPNM had been the result of many years of work by the Agency. Hungary strongly supported the Austrian initiatives which had made the timely convening of the conference possible and welcomed the amendments which had been adopted by consensus and would serve to establish a more stringent international regime for the physical protection of nuclear material.

33. The International Conference on Nuclear Security held in London in March 2005 had noted that nuclear terrorism was one of the greatest threats to society and had recognized the Agency's leading role in global efforts to improve the world nuclear security framework. Hungary was ready to strengthen its national system further in order to contribute actively to global efforts. An important step towards strengthening the global legal framework to counter the terrorist threat had been the adoption of the International Convention for the Suppression of Acts of Nuclear Terrorism by the General Assembly in April 2005. He was proud to announce that Hungary had recently signed it.

34. The Agency also deserved commendation for having organized the International Conference on the Safety and Security of Radioactive Sources held in Bordeaux, which had been a great step towards improving overall understanding of and preparation against the risks posed by radioactive sources in case of malevolent use.

35. The International Ministerial Conference on Nuclear Power for the 21st Century had addressed issues of great importance to Hungary. One message had been that without nuclear energy, the world's growing demand for electricity would be much less likely to be met. In Hungary, it was uncontested that the security of the country's energy supply could not be maintained without nuclear power, which fortunately had high public acceptance, but it was not unconditional and would need to continue being earned.

36. Operational safety was the alpha and omega for nuclear power plants, and neither licensee nor regulator could afford to take it for granted, a fact of which Hungary had been reminded by a fuel-cleaning incident in 2003. On the basis of the recommendations of an Agency expert mission and of self-evaluation, a number of changes had been made at the Paks nuclear power plant and at Hungary's regulatory body with a view to enhancing plant safety and improving the safety culture. There had been organizational changes and the legal environment had been modified, including the revision of the nuclear safety codes and related guidelines. Every effort had been made to eliminate the consequences of the 2003 incident. After considerable preparatory work by the nuclear power plant and evaluation by the regulator, a licence had been granted with some 50 conditions and requirements.

37. The results of the measures taken had been acknowledged by the Third Review Meeting of the Contracting Parties to the Convention on Nuclear Safety and by the very successful follow-up expert mission conducted by the Agency in 2005. The expert team had determined that the actions taken by the Paks nuclear power plant and the regulatory authority had brought tangible progress and concluded that all issues were either fully resolved or progressing satisfactorily. The Hungarian Government was grateful to the Agency for its support and was pleased with the achievements, while remaining well aware that complacency was unfounded.

38. While the Government was ready to provide the necessary political support for ensuring the long-term operation of the plant, it also recognized that waste disposal remained a major issue. Following a very successful referendum at the proposed site for disposal of low- and intermediate-level waste from the Paks nuclear power plant, Parliament's preliminary approval was

awaited to initiate activities for construction of a new radioactive waste disposal facility there. Hungary would be presenting a more detailed report at the Second Review Meeting of the Contracting Parties to the Joint Convention in May 2006, at which it hoped to welcome new countries with broad experience in the field.

39. Technical cooperation, one of the three pillars of the Agency's activities, had been greatly enhanced in Europe by regular consultation meetings organized by the Agency. The spirit of partnership, participation and strong personal relationships between Member States and the Secretariat was the backbone of successful technical cooperation in Europe, which was worth mentioning at a time when the Department of Technical Cooperation was undergoing a reorganization. Hungary had strongly supported the streamlining of the Agency's technical cooperation activities while also underlining the importance of stability and the preservation of past values.

40. He was convinced that national technical cooperation programmes would gradually be phased out in Europe and that technical cooperation activities should accordingly focus mainly on regional cooperation, which promoted the self-reliance and sustainability of nuclear institutions as well as encouraging mutual assistance, an example being Hungary's recent offer of US \$50 000 to the national programmes of two countries in its region.

41. He was pleased to announce his Government's decision to pledge its voluntary contribution to the TCF for 2006 in an amount corresponding to its share of the target. Bearing in mind the importance of the Agency's technical assistance programme and its timely implementation, Hungary urged all Member States to pay their share in full and on time.

Mr. Skoknic (Chile), Vice-President, took the Chair.

42. Mr. MIRANDA (Bolivia) said that his country belonged to a nuclear-weapons-free region but, in seeking sustainable development to meet the needs of its population, wished to use nuclear energy for peaceful purposes. It accordingly endorsed the phrase "Atoms for Peace" as the Agency's motto and as a reflection of its objectives. It also attached importance to preserving the balance between the Agency's statutory functions while using all available media to increase public awareness of the Agency's achievements in its different areas of activity.

43. Bolivia highly valued the technical cooperation received through the Agency in sectors which were important for its people's well-being, such as agriculture, water treatment, radiation protection and safety, and above all health. He thanked those countries that contributed to the availability of appropriate techniques through the Agency and encouraged them to continue in that spirit, as there was no better answer to conflict and troubles than a community whose basic needs had been satisfied and which could look forward to growth and equitable human development.

44. The countries of Latin America and the Caribbean, including Bolivia, aware that they must take the initiative to meet their own needs, had signed the ARCAL agreement more than twenty years previously with a view to cooperating in the peaceful uses of nuclear energy. That agreement had been of benefit to all its members. Bolivia had recently assumed the presidency of ARCAL and was committed to drawing up with the Agency, during the first half of 2006, an action plan to implement the strategic alliance with the Agency to deepen the traditional relationship between the two bodies.

45. A pioneering initiative of the Agency which Bolivia particularly welcomed was PACT, for it was essential to promote better use of nuclear technology for cancer treatment. Bolivia hoped that the Agency would continue to provide assistance in that regard.

46. Bolivia shared the views expressed repeatedly by the Director General regarding the reformulation of small quantities protocols to improve the safeguards system. In accordance with the decision on that matter taken by the Board of Governors, Bolivia awaited the Secretariat's proposals,

hoping that the required modifications would have no financial implications for Member States at the present time or in the future.

47. U Tin WIN (Myanmar), having welcomed Belize to membership of the Agency, expressed appreciation of the Agency's achievements in the areas of nuclear non-proliferation and safeguards, nuclear radiation and waste safety and security, and nuclear applications for global sustainable development.

48. He noted that the number of additional protocols in force had increased from 41 in 2003 to 64 in 2004, including 19 States with significant nuclear activities, while the number of States party to the NPT that had yet to conclude comprehensive safeguards agreements had decreased from 45 to 40.

49. Myanmar had signed the CTBT in 1996, and at the Fifth ASEAN Summit held in Bangkok in December 1995 it had signed the Treaty on the Southeast Asia Nuclear-Weapon-Free Zone, which had entered into force in 1997 and was aimed at general and complete nuclear disarmament and the promotion of international peace and security. Nuclear-weapon-free zones in various regions of the world were effective measures in preventing nuclear weapons proliferation and contributing to nuclear disarmament.

50. The Agency's technical cooperation activities were important in achieving sustainable development in many countries, as nuclear techniques were environment-friendly and nuclear power generation did not emit pollutants. The use of nuclear techniques had contributed in Myanmar to national development efforts in such areas as stockbreeding, food, agriculture and health.

51. Technical assistance from the Agency in the form of equipment, experts and training ensured the availability of nuclear medicines, radiotherapy, nuclear diagnostic methods and other nuclear techniques for medical research and industry in Myanmar. In implementing its programme to promote and develop nuclear applications, Myanmar was aware of the need for an adequate radiation protection and waste safety infrastructure and was drawing up regulations for the safe use of radiation and atomic energy. He thanked the Agency for the assistance that had been provided through the interregional Model Projects on upgrading radiation protection and waste safety infrastructures and noted that by the end of 2004, more than 90 Member States had been participating in such Model Projects.

52. All developing countries possessing a level of nuclear technology development comparable to Myanmar's deserved the Agency's assistance. He urged the Conference, the Director General and the Secretariat to take further steps in support of a policy of prioritizing technical assistance programmes in less developed Member States.

53. Recalling the Agency's mediating role in regional cooperation to promote nuclear science and technology, he noted that the RCA (the Agency's first regional agreement), AFRA and ARCAL were doing well in their respective regions with effective Agency involvement.

54. In conclusion, he expressed the hope that the Director General and the Secretariat would continue in their efforts to achieve international stability and peace, and assured the Agency of Myanmar's continued support for its activities.

55. Mr. NEZAM (Afghanistan) said that of the many challenges facing the Agency, one of the most important was nuclear proliferation, which posed a real threat to international peace and security and was therefore a source of deep concern for the international community. The Government of Afghanistan condemned any attempt to use nuclear technology for non-peaceful or terrorist purposes and accordingly attached great importance to the efforts made by the Agency to combat nuclear terrorism. In order to contribute to the Agency's efforts, Afghanistan had already ratified its safeguards agreement, and its additional protocol had entered into force on 19 July 2005.

56. While underlining the importance of universal adhesion to all international non-proliferation instruments, particularly in the nuclear field, his country reaffirmed the right of States to use nuclear energy for exclusively peaceful purposes, as laid down in Article IV of the NPT. Respecting that right would further strengthen the non-proliferation regime, as well as allowing nuclear technology to make its essential contribution to development.

57. Over the last three years, Afghanistan had undergone a political transformation which bore witness to the courage of its people and the devotion of the international community. That process had been followed by the entry into force of the new constitution and by presidential and parliamentary elections. Afghanistan had also made significant progress in reconstruction. Unfortunately it still remained one of the poorest countries in the world. It accordingly would like to see more assistance given to the least developed countries, so as to allow them to catch up with other countries in terms of nuclear knowledge and benefit from the peaceful applications of nuclear energy.

58. Technical cooperation was a major component of the Agency's activities and of crucial importance to the developing world. Afghanistan particularly welcomed the Agency's efforts to strengthen international cooperation in the areas of nuclear, radiation and transport safety and radioactive waste management. Afghanistan was conscious of the need for an adequate radiation protection and waste safety infrastructure and was preparing radiation protection legislation that would give it efficient regulations as well as promoting nuclear technology.

59. Two years previously, active cooperation had begun between Afghanistan and the Agency in a number of areas including training programmes and international conferences related to different professional activities. The collaboration helped Afghanistan to acquire expertise and enabled it to use nuclear techniques in its development strategy to fight poverty. To that end, Afghanistan had established priorities in the areas of radiotherapy, agriculture and isotope hydrology.

60. For the 2007–2008 cycle, his Government envisaged integrating nuclear techniques in the health sector, specifically in the areas of radiotherapy and nuclear medicine. Particular attention would also be paid to agriculture, through projects on soil fertility and increasing agricultural production, and to training and management of human resources in isotope hydrology for water resource management.

61. Such activities would allow the Government to draw up and apply in the medium term a real policy for nuclear knowledge management. The Government had invited Agency experts to Afghanistan to help its authorities identify and formulate the country's urgent needs with the aim of preparing a CPF as a short- and medium-term planning instrument which could broaden the scope of cooperation between the Agency and Afghanistan.

62. In that context, Afghanistan invited the Agency to take appropriate measures to supply the necessary financial resources for theoretical and practical training in nuclear knowledge and to facilitate the acquisition of equipment under technology transfer programmes.

63. Afghanistan had undertaken to honour its financial commitments to the Agency and had already settled some of its arrears in accordance with the payment schedule agreed by both parties. That demonstrated Afghanistan's firm support for the Agency in accomplishing its valuable tasks.

64. Mr. CABELLO SARUBBI (Paraguay) said that his country, proud to be part of the world's first inhabited nuclear-weapon-free zone, firmly opposed any nuclear weapons proliferation and therefore demanded the cessation of all nuclear testing and the reduction of existing arsenals. Full adherence to existing treaties in that regard was an essential contribution to global peace and security. As United Nations Secretary-General Kofi Annan had recognized, the international community's biggest failing was in the area of nuclear non-proliferation and disarmament, and it should reflect upon past errors and show a strong political will to correct them.

65. Paraguay supported the decision on SQPs taken by the Board of Governors to eliminate loopholes that weakened the safeguards system. Paraguay would take steps to adopt the necessary amendments as soon as possible through the recommended mechanism.

66. The CPPNM had been strengthened by the amendments adopted by the diplomatic conference in July 2005, and Paraguay would ratify those amendments as soon as possible as a further indication of its firm commitment to international security.

67. At that conference, Paraguay had proposed extending the CPPNM to apply, *mutatis mutandis*, to all radioactive material and associated facilities, since national and international security demanded clear standards for the protection and custody of such material and facilities. Although the Code of Conduct on the Safety and Security of Radioactive Sources was an important tool, it was not legally binding, which was a weakness that should be borne in mind.

68. Paraguay, like many other countries, did not have nuclear reactors, but it was aware that many radiological accidents had occurred in the past. Furthermore, it considered it important to guard against the possible criminal uses of radioactive materials, so as to avoid disastrous consequences. Of course not all radioactive material required special security measures; however, it would be a valuable exercise to identify those materials that could be used harmfully, in particular for terrorist purposes, and to take preventive measures against such use.

69. In view of its concerns regarding the security of radioactive material, Paraguay had organized and financed a national day on illicit trafficking in radioactive material with the participation of all the national institutions responsible for the control and safety of transport of nuclear material within and outside the country.

70. Turning to international safeguards issues, he welcomed the results of the last round of the six-party talks in which the DPRK had agreed to abandon its nuclear weapons and any related nuclear programmes with a view to its return to the NPT regime and to the Agency's safeguards system.

71. He hoped that the interrupted negotiations between the European countries and the Islamic Republic of Iran would be resumed as soon as possible in order to find a balance between the interests of both parties that would allow Iran sufficient technology and inputs to develop a peaceful nuclear programme while also generating sufficient confidence that there was no diversion to activities prohibited by current international legislation.

72. Paraguay continued to benefit from technical cooperation in the peaceful uses of nuclear technology and congratulated the Agency on increasing the contribution of atomic energy to global peace, health and prosperity.

73. In October 2005, the Agency would be sending a mission to Paraguay to evaluate its nuclear and radiological safety needs. Based on the results of that mission, a national integrated nuclear safety plan would be drawn up to help the authorities work more effectively for national and international safety. Moreover, with assistance from the Agency, a national course had been held in 2004 on preparedness for and response to radiological emergencies. As a result, a technical team had been formed to draw up a national response plan for such emergencies which was currently being implemented. Advice from the Agency had also aided the formulation of a draft law to create a single regulatory authority which was being considered by Congress. That would facilitate inter-institutional cooperation and efficiency in applying the Agency's recommendations. The assistance provided by the Agency in 2004 in the form of fellowships, scientific visits and expert missions, and of equipment, spare parts and accessories, had been invaluable as well.

74. He welcomed the recent entry into force of the ARCAL regional agreement, which had provided another opportunity for cooperation between the countries of Latin America and the

Caribbean. Since ARCAL had been established in 1984, Paraguay had benefited from many projects, including seven in 2004 in areas such as cancer treatment, atmospheric pollution studies, quality control for mammography, nuclear telemedicine and the purchase of laboratory equipment. In that context, he welcomed the establishment of a strategic alliance between ARCAL and the Agency, and also with specialized institutions in developed countries, to ensure increased benefits for Member States from nuclear scientific and technological development.

75. His country supported enlargement of the Board to provide greater and more democratic participation in the Agency's policy-making organs, for despite a significant increase in the membership of the Agency, the Board had not been enlarged since 1989.

76. Welcome progress had been made with respect to equitable and balanced geographical representation on the Agency's staff, especially for developing countries. However, the low percentage of women working in the Agency, particularly at the Professional level, continued to be a concern. The Secretariat's initiatives to remedy that situation were welcome and he looked forward to seeing positive steps in that regard.

77. Mr. MAZI (Albania) expressed his country's continuing support for the Agency and said the scope of its activities had continued to expand and it had responded efficiently to challenges in all areas of its work.

78. Disarmament and non-proliferation were priorities of Albanian foreign policy and his country was committed to meeting all its obligations under the related international treaties. It was regrettable that the 2005 NPT Review Conference had not produced any substantive results. Albania attached great importance to all resolutions adopted by the General Conference and the Board of Governors, in particular those aimed at ensuring an effective, efficient and universal international safeguards system.

79. Albania had signed its additional protocol and would make every effort to bring it to parliamentary ratification in the near future.

80. While recognizing the significance of the Agency's safeguards regime, Albania attached equal importance to the Agency's non-safeguards activities. It considered that nuclear techniques could make substantial contributions to scientific and technological development and to national programmes. Albania's policy was to revitalize non-power applications of nuclear technology, assure radiation protection and safety, further improve and consolidate the regulatory framework and infrastructure in line with international obligations, and harmonize the legal basis of nuclear activities with international legal requirements. The country would continue to benefit from technical cooperation provided by the Agency while still fulfilling the national commitments and obligations that such cooperation entailed.

81. As a recipient country, Albania had benefited from the Agency's national and regional technical cooperation programmes and thanked the Agency for that assistance, which had had a positive impact in various peaceful nuclear applications.

82. The Director General had visited Albania in April 2005 and had met the President, the Prime Minister and the Minister of Foreign Affairs. He had stressed the importance of cooperation between the Agency and Albanian institutions in human health, through national projects and PACT, and in nuclear security, to combat illicit trafficking in radioactive material and terrorist acts and to reduce radiological threats.

83. Albania appreciated the Agency's work in radiation therapy and cancer control and considered that it should be pursued and strengthened. Human health would continue to be a priority for Albania in the coming years and assistance in that area had a positive direct impact on its people.

84. The seriousness with which Albania viewed technical cooperation was reflected by its full payment of its obligations to the Agency. He called on all Member States to pay their obligations on time and in full, in order to receive continued and sustained assistance from the Agency.

85. In September 2005, Albania had signed an updated CPF for subsequent technical cooperation cycles. Human health would continue to be the main priority; a memorandum of understanding had also been signed in 2005 to formalize technical cooperation with the Ministry of Health in the area of radiotherapy and to facilitate the submission of funding requests for joint technical cooperation activities for consideration within the Albanian budget. The Agency had developed a long-term technical cooperation programme for radiotherapy, and the Ministry of Health had agreed to share the cost of that programme. A plan to upgrade nuclear medicine services was under consideration. The Agency's assistance in that area, including providing an emergency radiotherapy machine, training and expert services to the Mother Teresa Hospital, was appreciated and, he hoped, sustainable.

86. Albania had been the first country to receive a team from PACT to review its cancer management infrastructure. PACT had the potential to maximize the public health value derived from radiotherapy projects aimed at fully meeting treatment needs within a broad-based cancer capacity-building plan. The integration of all cancer-related efforts in the context of a systematic and global approach would give the country a solid base for fund-raising.

87. Mr. BEKOE (Ghana), welcoming Belize to the Agency, said that the expanding membership showed that Member States had confidence in the Agency as a body responsible for the promotion of the safe application of nuclear technology, impartial nuclear verification, nuclear security and the prosperity of countries.

88. Ghana believed strongly that peace was essential for social and economic development. Therefore atomic energy and any other technological advancement must be used only for the purpose of improving human conditions and enhancing harmony among all nations.

89. The misuse of nuclear technology was a serious threat to world peace and should not be tolerated by peace-loving people. That was why Ghana fully appreciated the Agency's efforts to create nuclear-weapon-free zones. The fact that Ghana had been a signatory to an additional protocol since 1998 showed its commitment to the Agency's safeguards and verification regime. Ghana urged all Member States, particularly those in Africa, to sign and ratify without delay additional protocols and other treaties and conventions of the Agency.

90. Ghana was deeply satisfied with the Agency's technical cooperation activities and its work to advance nuclear power through the development of innovative reactor and fuel cycle technologies, and to promote nuclear safety and security, the application of nuclear techniques and nuclear knowledge management.

91. The Government of Ghana acknowledged with gratitude the cordial relationship, cooperation and strong partnership that existed between the Agency and the Ghana Atomic Energy Commission.

92. Nuclear technology played a significant role in Ghana, especially in the areas of food and agriculture, industry and human health. The country had a good safety record in radiation protection, which covered the operation of its research reactor, two radiotherapy installations for cancer treatment, applications in industry for the detection of faults in welds, and the sterilization of surgical and other medical instruments and supplies.

93. In the field of human health, successful cooperation between Ghana and the Agency had led to the establishment of the country's second national centre for radiotherapy and nuclear medicine in Kumasi. The centre had been commissioned by President Kufuor in January 2005 in the Director General's presence. Both the new centre and the older one would fulfil important functions in the

diagnosis of cancer and the treatment of cancer patients from Ghana and neighbouring West African countries.

94. He expressed appreciation to the staff of the Department of Technical Cooperation, particularly of the Africa Section, for the significant role they had played in preparing the CPF for 2005–2010, which would be most useful in planning and implementing projects to address national priority areas for development. Ghana was planning to embark on programmes to promote the use of nuclear energy in a sustainable manner.

95. Ghana believed that preservation, maintenance and enhancement of nuclear knowledge played a central role in ensuring the sustainable and safe operation and effective use of nuclear facilities. The Ghana Atomic Energy Commission, in collaboration with the University of Ghana, was in the final stages of establishing a graduate school of nuclear and allied sciences. The Government of Ghana wished to place emphasis on strengthening the national capacity for postgraduate teaching and research and would appreciate technical assistance from the Agency, its Member States and other international organizations to promote networking among institutions providing education and training in the same area.

96. Mr. CLEUTINX (European Commission) recalled that five years previously the Commission had started a strategic debate on energy supply inside the European Union, mindful that security of supply and energy efficiency were prerequisites for economic growth and welfare, and therefore high-priority issues. The European Union did not rule out any of the choices of energy sources. Currently, nuclear power accounted for more than one third of the electricity produced in the European Union. It was a stable source of energy largely shielded from the price fluctuations that were currently affecting the oil and gas markets.

97. The option of generating nuclear energy belonged to each individual Member State. The Euratom Treaty provided a comprehensive framework for the civilian use of nuclear energy in the European Union and entrusted the Commission with the task of ensuring that the objectives and standards it set were observed across the Union. Only by adhering to the conditions set out in the Euratom Treaty, including with respect to operation, decommissioning, and safe management of radioactive waste and spent fuel, could the States of the European Union hope to make the nuclear option a politically and environmentally acceptable one. Public acceptance was a prerequisite for the further development of nuclear power as an energy source.

98. In 2003, the Commission had adopted two proposals for directives concerning nuclear safety and safe management of radioactive waste. They had been modified in 2004 to take into account the opinion of the European Parliament and the results of discussions within the Council of Ministers. Consultations with national authorities and representatives of industry had been held, and although support had been accumulated, it was not yet sufficient to obtain the qualified majority in the Council needed for adoption of the proposals. The Commission remained convinced, however, that common rules on nuclear safety and security were to the benefit of all EU citizens.

99. The sustainable management of radioactive waste and spent fuel was the one issue which posed the greatest problem to public acceptance. The Commission was considering a number of initiatives to support Member States in tackling the significant scientific and technical challenges posed by the management of such waste, including the establishment of a joint undertaking — a public body to pool resources to that end with private actors.

100. The safe closure and decommissioning of reactors that had reached the end of their lifetime or that could not be upgraded at reasonable cost had to be ensured. Detailed provisions for a number of installations had been negotiated before the recent enlargement of the Community. The Commission was continuing to invest substantial financial assistance to ensure the timely closure and

decommissioning of the installations concerned. The latest Community safety programme allocated significant financial assistance to priority nuclear safety projects in the acceding countries of Bulgaria and Romania, and provisions on specific installations would be a part of the accession agreement for the next enlargement of the Union.

101. Having highlighted the Commission's close cooperation with the Agency in maintaining safety levels at all stages from operation to decommissioning, he said that the Community was increasing its participation in IAEA conventions. The Commission had taken part in the latest Review Meeting of the Contracting Parties to the Convention on Nuclear Safety and had found its objectives on nuclear safety to be consistent with those of the Agency. The European Union supported a nuclear safety programme in the Newly Independent States aimed at improving safety and promoting an effective safety culture. It also supported international projects and actions such as the Chernobyl Shelter Fund, the G7/EU initiative on the closure of Chernobyl, and the Northern Dimension Environmental Partnership.

102. The European Union continued to streamline its policies and action in the fight against terrorism. Tackling illicit trafficking in nuclear material and improving the regulatory framework for dual-use items were top priorities on the Commission's agenda. The Community was a party to the CPPNM and welcomed its revision to extend the fight against terrorism. The Community had also passed an internally binding legislative act as a follow-up to the Agency's action on the control of high-activity sealed sources and orphan sources.

103. For more than 45 years, the Commission had been exercising safeguards controls in European nuclear installations under the Euratom Treaty. Its common multilateral system for safeguarding nuclear materials was unique in the world, since its nuclear material control activities applied fully without any differentiation or discrimination to all civil nuclear installations, whether located in nuclear-weapon or non-nuclear-weapon States in the European Union. Two hundred Euratom inspectors helped to ensure that EU Member States complied with their international safeguards obligations. The high level of expertise accumulated by the Commission in the field of nuclear safeguards contributed to a climate of confidence not only among Member States of the Union, but throughout the world. Euratom safeguards represented the most intensive aspect of cooperation between the Community and the Agency, and he welcomed the ongoing efforts to improve efficiency and effectiveness in that area.

104. After expressing regret about the lack of substantive progress at the 2005 NPT Review Conference, he said that the Commission had taken the necessary steps for the successful implementation of additional protocols in the Community. The new Euratom regulation on the application of Euratom safeguards, setting out the reporting standards necessary to implement the provisions of additional protocols in the European Union, had entered into force earlier in the year. The successful implementation of the additional protocol in the EU Member States would help to promote the universalization of the additional protocol and establish it as an integral part of the Agency's verification standard.

105. The underlying aim of the Euratom treaty was to promote the development of nuclear energy by developing the knowledge and means to exploit nuclear energy for civilian purposes, inter alia through research and the dissemination of technical know-how. The Commission was accordingly grateful to the Agency for its support for the ITER project, and in particular to the Agency staff for its role in resolving the ITER site issue. The Commission looked forward to a continuing fruitful relationship between ITER parties and the Agency.

106. The Commission had launched internal consultations within the Community to provide for possible accession to the international framework agreement among the members of the Generation IV International Forum.

107. The Commission had a long history of cooperation with the Agency, which should be maintained and strengthened. Recalling that Euratom only had the status of observer at the Agency, he said that the Community was examining legal tools for its more effective integration and participation in the work of the Agency with a view to promoting and ensuring safe and responsible use of nuclear energy in the world.

The meeting was suspended at 12.15 p.m. and resumed at 12.25 p.m.

Mr. Bazoberry (Bolivia), President, resumed the Chair.

13. Appointment of the External Auditor

108. The PRESIDENT said that the tenure of the Agency's current External Auditor would end with the completion of the audit of the Agency's accounts for the financial year 2005. It would therefore be necessary to appoint an External Auditor to audit the Agency's accounts for 2006 and 2007.

109. At its June meetings⁶, the Board of Governors had agreed to recommend to the General Conference the appointment of the Vice-President of the German Supreme Audit Institution as the External Auditor to audit the Agency's accounts for the financial years 2006 and 2007. He took it that the Conference wished to follow the Board's recommendation.

110. It was so decided.

– Request for the restoration of voting rights (GC(49)/INF/13)

111. The PRESIDENT noted that the General Committee had had before it a request from Iraq for the restoration of its voting rights. It had recommended that Iraq's right to vote be restored during the current session of the Conference for a period of one year ending prior to the commencement of the next session of the General Conference because it was of the view that Iraq's failure to pay the amount necessary was due to conditions beyond its control.

112. He took it that the Conference accepted the recommendation of the General Committee.

113. It was so decided.

⁶ See GOV/OR.1127, paras 183–184.

26. Examination of delegates' credentials (GC(49)/27)

114. The PRESIDENT said that the General Committee had met earlier in the day to examine to credentials of all delegates, as provided for in Rule 28 of the Rules of Procedure. The report of the Committee was contained in document GC(49)/27. Since the report had been issued, the Secretariat had received credentials in due form from the delegates of Qatar and Serbia and Montenegro. After discussion, the Committee had recommended the adoption by the Conference of the draft resolution contained in paragraph 7 of its report, with the reservations and positions expressed in the report.

115. Ms. ABDEL-MEGIED (Egypt) said that Egypt's acceptance of the credentials submitted by the delegation of the State of Israel should on no account be understood as covering any occupied Arab territories, but only the area within the borders of 4 June 1967.

116. Mr. HOSSEINI (Islamic Republic of Iran) said that his delegation wished to express its reservations regarding the credentials of the delegation of Israel. In accordance with its position of principle his country continued not to recognize Israel as a State.

117. The PRESIDENT took it that the General Conference was prepared to adopt the draft resolution contained in paragraph 7 of document GC(49)/27.

118. It was so decided.

9. Election of members to the Board of Governors (GC(49)/6 and 22)

119. The PRESIDENT recalled that in 1989 the General Conference had approved a procedure whereby, when there was agreement regarding the candidate or candidates from a particular area, no secret ballot would be held; balloting would only take place for those areas where no list of candidates had been agreed upon. That procedure considerably facilitated the rational use of the Conference's time. Accordingly, he proposed that Rule 79 of the Rules of Procedure of the General Conference, which provided that elections to the Board should be by secret ballot, be suspended in respect of those areas for which there was agreement.

120. It was so decided.

121. The PRESIDENT said he was happy to report that agreement had been reached in all area groups on their candidates for the vacancies to be filled. He expressed his sincere appreciation to all groups for their efforts to reach agreement, which had expedited the Conference's work.

122. Drawing attention to document GC(49)/6, containing a list of the Agency Member States designated to serve on the Board from the end of the Conference's current session until the end of the fiftieth (2006) regular session, he recalled that, under Rule 83 of the Rules of Procedure, he had to inform the General Conference of the elective places on the Board that had to be filled. To that end, document GC(49)/22 had been prepared; it indicated that the Conference had to elect eleven members of the Board from the seven categories listed.

123. He took it that the General Conference wished to elect Colombia and Cuba to the two vacant seats for Latin America.

124. Colombia and Cuba were duly elected.

125. The PRESIDENT took it that the General Conference wished to elect Greece and Norway to the two vacant seats for Western Europe.

126. Greece and Norway were duly elected.

127. The PRESIDENT took it that the General Conference wished to elect Belarus and Slovenia to the two vacant seats for Eastern Europe.

128. Belarus and Slovenia were duly elected.

129. The PRESIDENT took it that the General Conference wished to elect Egypt and the Libyan Arab Jamahiriya to the two vacant seats for Africa.

130. Egypt and the Libyan Arab Jamahiriya were duly elected.

131. The PRESIDENT took it that the General Conference wished to elect the Syrian Arab Republic to the vacant seat for the Middle East and South Asia.

132. The Syrian Arab Republic was duly elected.

133. The PRESIDENT took it that the General Conference wished to elect the Republic of Korea to the vacant seat for the Far East.

134. The Republic of Korea was duly elected.

135. The PRESIDENT took it that the General Conference wished to elect Indonesia to the floating seat for the Far East/MESA/SEAP, which it was the turn of a member from SEAP to fill.

136. Indonesia was duly elected.

– **Report of the Scientific Forum**

137. The PRESIDENT invited the Rapporteur, Mr. Richter, to present the report of the Scientific Forum.

138. Mr. RICHTER (Rapporteur of the Scientific Forum) presented the report which is reproduced in the Annex.

139. The PRESIDENT thanked Mr. Richter for his most interesting presentation and the Secretariat for its excellent preparation of the Scientific Forum.

The meeting rose at 1 p.m.

Report to the 49th Regular Session of the IAEA General Conference from the 8th Scientific Forum

Chairman Prof. Burton Richter, Director Emeritus at the Stanford
Linear Accelerator Centre (SLAC)
29 September 2005

Mr. President,

As the Chairman of the 8th Scientific Forum, it is my privilege to report to you and the Plenary the main points from the presentations and debates of the Forum. The Forum took place in an excellent and constructive spirit under the title "Nuclear Science: Physics Helping the World". The four sessions of the Forum focused on: Meeting Energy Needs; Developing Advanced Materials and Technologies; Advancing Radiation Medicine and Supporting Nuclear Safety.

This Forum took place in the U.N.'s World Year of Physics. This is the 100th anniversary of Albert Einstein's revolutionary year - perhaps the greatest single year of innovation by any one scientist. In 1905 Einstein wrote on Relativity, the Photoelectric Effect, and Brownian motion. None of these papers was as mathematically complex as were his later papers on general relativity, but all showed new ways of looking at nature. The impact of all of them has been profound.

Looking backward in time, there is no problem in demonstrating that physics not only has helped the world, but is fundamental to the world of today. It is not an exaggeration to say that the foundation of almost all of today's technology rests on the physics of the 20th century. There are new things in the laboratories of the 21st century that are not yet fully understood, ranging in scale from the cosmic to the sub-nuclear. Some are already at the threshold of application. For example, carbon nanotubes can make transistors or strengthen materials. Others are at an earlier stage. For example, quantum computing may or may not ever work, but if it does it promises speed ups of a factor of a million or more for certain classes of problems.

The physics of the 21st century will surely bring great practical benefits.

The four sessions of the Forum focused on the future in areas related to critical needs of society, and that are related to the mission of the IAEA.

Session 1 presented how nuclear science is helping meet the world's energy needs. Keynote lectures, panellists' remarks, and the panel discussion illustrated the tangible benefits of fundamental physics by drawing the big arch from Einstein's mass-energy equivalence formula to the R&D and the engineering applications in the various fields that form the basis for both fission and fusion energy.

Demographics and economic development worldwide, especially in developing countries, are projected to lead to a doubling of primary energy demand by 2050. This trend, coupled with rising concerns about global warming, has brought the nuclear option to the forefront of attention and has highlighted the importance of innovation in this area. Nuclear energy cannot solve all energy problems but it can be an important contributor.

The Session presented the status of both fission and fusion energy, addressing major issues and prospects, discussed novel approaches, and identified the way forward and the potential role that IAEA could play.

As far as fission is concerned, it was noted that a big expansion of fission energy requires closing the fuel cycle, from both a waste management and proliferation point of view. Hence, the importance of the fast reactor, which provides the flexibility to either breed or incinerate minor actinides, was highlighted. By 2010 only two high-power fast reactors will be available for R & D work. Therefore, it was suggested that coherent international programmes be set up to maximize the use of these fast reactors.

With regard to the proliferation issue, once-through fuel cycles do not seem to be that much more beneficial than recycle strategies. The importance of research and technology development to strengthen technical safeguards was stressed.

The idea of internationalising the nuclear fuel cycle was discussed. It was recognized that this option could offer substantial benefits to smaller countries. However, the realization of such an idea presupposes that solutions to many political, legal and administrative issues are found. As a possible way forward, it was suggested that IAEA start working on such strategies.

As far as fusion is concerned, the decision to build ITER at Cadarache, France is a very positive development. ITER must succeed in demonstrating a burning plasma for fusion energy to become practical. Even if it does, the earliest commercial deployment of fusion is anticipated around 2040 to 2050, setting fusion development into the same timeframe as Generation IV Reactors.

The Session's highlights can be summarized as follows:

There is no single solution to the problem of "meeting energy needs". All options will be needed, including conservation and increased efficiency.

The energy debate has to involve all players – developed as well as developing countries. In this context, international collaboration under the aegis of organizations like the IAEA has a crucial role to play. Initiatives like the Agency's INPRO project and also Generation IV could serve as a mechanism for such collaboration. Such initiatives could also extend their scope to include new ideas that ongoing R&D will produce, and address issues such as development of infrastructure in developing countries to enhance the efficiency of energy use.

For post-Kyoto (after 2012), it will be necessary to include the nuclear option in the clean development mechanism and to bring in the developing countries as participants.

As far as proliferation resistance is concerned, science can play a role but alone cannot solve the problem. Politicians must be called upon to produce and enforce binding agreements to address this issue. IAEA's safeguards at their present size cannot cope with a considerable increase in nuclear power production worldwide.

The objective of Session 2 was to discuss how the principles of nuclear science have helped in the analysis and understanding of various materials.

Advanced materials and technologies are a direct result of basic science. The improved performance of the present generation of nuclear reactors is an outcome of advances in materials. More will have to be done since some advanced Generation IV reactors are beyond the capabilities of current materials. Higher operating temperature, higher fuel burn-up and structural integrity at higher fluence all require development of new materials in meeting the exacting requirements of nuclear systems comprising fuels, structural materials, moderators and coolants.

The development of new fuels that can contain the minor actinides, which create the biggest waste disposal problems, is of the highest priority. A closed fuel cycle will enable a considerable reduction of the burden of long lived radioactive waste.

Radiation sources, including accelerators, are important in such diverse fields as industrial processes, agriculture and health care. Many technologies in these fields, such as the sterile insect technology and mutation plant breeding, are supported by the IAEA. New radiation applications are being developed based on reliable accelerators that are commercially available at reasonable prices.

Charged particle accelerators are playing an increasing role in industry and medicine. Neutrons produced with a high power proton accelerator are used for basic research and industrial radiography. They may also play a role in transmutation of highly radioactive fission products. Neutron radiography is complementary to x-ray tomography as neutrons can penetrate deeper into heavy materials.

Accelerator Mass Spectroscopy is an extremely sensitive method to detect trace materials and has applications in nuclear non-proliferation, climate research, archaeology and even in the food industry.

Nuclear measurements are essential for IAEA safeguards programme. The science and technology have made considerable progress, and this area is an attractive field for young scientists and engineers. The trend in nuclear measurements is towards higher detection efficiency and capability to measure short-lived isotopes in very low quantities. Specific methods like laser technology open new and innovative areas of fundamental science and applications within this realm.

For long-term benefits to IAEA programs, cooperation with universities and research institutes should be strengthened. Collaboration of nuclear centres with universities also increases the potential for collaboration with students from developing countries.

This session concluded with a presentation on the International Nuclear information System (INIS).

The third session on Radiation Medicine discussed the use of ionising radiation for the diagnosis and treatment of diseases such as cancer. There have been significant advances in diagnostic imaging to visualise tumours in 3-dimensions and more recently, in functional imaging to localise the disease more precisely. At the same time, there have been advances in cancer treatment delivery that promise gains in therapeutic effectiveness as a consequence of escalating the dose to the precisely known location of the tumour. However, the lack of sufficient numbers of well-trained medical physicists in various regions of the world may prevent the transfer of high technology advances to developing countries resulting in a technology gap.

The first presentation concentrated on the impact of physics solutions to imaging for improved radiotherapy. 45% of cancer patients can be cured and of the 55%, for whom treatment fails, 18% are because of failure of local control and this could be improved. The integration of cross-sectional, anatomical and functional imaging into real-time radiotherapy was stressed. The techniques used include computed tomography, magnetic resonance imaging and positron emission tomography. Following the movement of the tumour in space and time using gated radiotherapy and other techniques such as biological profiling using MR spectroscopy within the treatment plan, can avoid irradiating healthy tissue and thus reduce complications.

The second presentation discussed better targeting of therapy and stressed that intensity modulated radiotherapy (IMRT) had enabled dose sculpting in 3D. Conformal avoidance radiotherapy avoids irradiation of normal tissue and the treatments can be more cost-effective. IMRT and tomotherapy can shorten treatment times, can be less expensive to deliver and will reduce the number of tumour recurrences.

The third presentation explained the role of medical physicists and the training they need to fulfil this role. Eight years after the setting up of the graduate programme in Mexico, 25 % of the clinically based medical physicists now have Master degrees, a qualification necessary to practice appropriately.

The fourth presentation demonstrated the effectiveness of concentrating research resources around a centre of excellence. Combining nuclear science with biotechnology has enabled Cuba to develop drugs, vaccines, therapeutics and diagnostics culminating in an FDA licence for a specific cancer vaccine. The link between isotope production and radiopharmaceuticals is clearly beneficial.

The panel discussion focused on the importance of regulatory needs for sustaining the use of radiotherapy equipment. A further point of major concern was in having access to trained staff in all the necessary disciplines. Various collaborative methods were proposed and one suggestion, to avoid brain drain, was to provide regional centres of excellence with on-site training, possibly with an Agency Professorial Chair to support this. The lack of recognition of Medical Physics as a profession was also highlighted and the Agency is addressing this issue.

It was also pointed out that although the sophisticated new combined imaging and treatment systems could improve the treatment of about 15 % of cancers, the older, more established, less expensive techniques could be used with great effect especially in countries where 70 % of cancers are not currently treated at all. It was agreed that having sophisticated equipment in place without trained staff is futile.

This session concluded with a presentation on the Agency's Programme of Action for Cancer Therapy (PACT), which is open to all Member States.

A precondition for continuing reliance on nuclear power, is assurance of nuclear safety. The fourth session explored various dimensions of this imperative.

The global nuclear safety regime provides the framework for nuclear safety. The international component of that regime should be strengthened by establishing a more effective network for sharing operating experience, undertaking further modification of IAEA safety standards to provide more complete guidance, enhancing safety culture, strengthening practices under the Nuclear Safety Convention, and undertaking multinational design review programs for new reactors. A fully engaged and informed regulator is essential.

The public perception of the risk of nuclear power must be directly addressed. This requires efforts to reach out to the public and to address their concerns candidly and completely. Operators and regulators have the obligation to achieve transparency in order to alleviate public concerns.

The particular importance of safety culture was emphasized. It is not possible to develop a comprehensive indicator of safety culture, but its achievement is of singular importance. Chief among its characteristics is the recognition that nuclear safety is the prime responsibility of those who own and operate nuclear plants.

The achievement of safety requires focused consideration of the management of technical knowledge. This includes the encouragement of the flow of information from countries that are sophisticated on nuclear operations to those that are just developing nuclear power capabilities. In this connection there is a need for an experienced and accomplished workforce.

There also is an opportunity to learn from past accidents, including those in other industries. Critical lessons include the need for sincere and committed leadership in making safety the highest priority, in encouraging continuing communication and learning, and encouraging alertness to organizational drift.

The session emphasized the critical importance of encouraging nuclear safety in the years ahead. Even with many decades of experience, we still have much to learn.

The scientific community greatly appreciates the IAEA initiative to organize this Scientific Forum on Nuclear Science: Physics Helping the World. It allowed very fruitful discussions and provided opportunities to share new ideas, to learn from each other and to forge new collaboration. The meeting showed that large progresses have been made in advancing nuclear science, but much needs to be done. Therefore, it is important for all countries to work together to realize the potential of nuclear science in addressing human needs.