

IAEA Board of Governors

Record of the 1177th Meeting
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Strengthening the Agency's activities related to nuclear science, technology and applications: Nuclear Technology Review 2007

Board of Governors

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Record of the 1177th Meeting

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¹ GOV/2007/12.

Attendance

(The list below gives the name of the senior member of each delegation who attended the meeting, as well as that of any other member whose statement is summarized in this record.)

Mr. PETRIČ		Chairman (Slovenia)
Ms. WILKINSON DE VEXINA	_____	Argentina
Mr. SHANNON		Australia
Ms. KÜHTREIBER		Austria
Mr. GAISENAK		Belarus
Mr. VALLIM GUERREIRO		Brazil
Ms. GERVAIS-VIDRICAIRE		Canada
Mr. SKOKNIC		Chile
Mr. TANG Guoqiang		China
Mr. ARÉVALO YÉPES		Colombia
Mr. MATEK		Croatia
Mr. CODORNIU PUJALS		Cuba
Mr. RAMZY	}	Egypt
Mr. KASSEM		
Mr. KEBEDE		Ethiopia
Ms. VÄÄTÄINEN		Finland
Mr. ALBERT		France
Mr. GOTTWALD	}	Germany
Mr. SANDTNER		
Mr. PAPADIMITROPOULOS		Greece
Mr. SHARMA		India
Mr. HISWARA		Indonesia
Mr. AMANO		Japan
Mr. PARK Chung-Taek		Korea, Republic of
Mr. EL-WAFI		Libyan Arab Jamahiriya
Ms. EL ABDAOUI		Morocco
Mr. OSAISAI		Nigeria
Mr. LUNDBY		Norway
Mr. ALI		Pakistan
Mr. POPOV		Russian Federation
Mr. KRIŽ		Slovenia
Mr. MINTY		South Africa
Ms. MELIN		Sweden
Mr. OTHMAN		Syrian Arab Republic
Mr. PANUPONG		Thailand
Mr. MACGREGOR		United Kingdom of Great Britain and Northern Ireland
Mr. SCHULTE		United States of America
Mr. ELBARADEI	_____	Director General
Mr. BURKART		Deputy Director General, Department of Nuclear Sciences and Applications
Mr. SOKOLOV		Deputy Director General, Department of Nuclear Energy
Mr. ANING		Secretary of the Board

Representatives of the following Member States also attended the meeting:

Afghanistan, Albania, Algeria, Angola, Armenia, Azerbaijan, Belgium, Costa Rica, Czech Republic, Dominican Republic, Estonia, Holy See, Hungary, Islamic Republic of Iran, Ireland, Israel, Italy, Jordan, Kazakhstan, Kenya, Kuwait, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Namibia, Netherlands, New Zealand, Peru, Philippines, Romania, Saudi Arabia, Slovakia, Spain, Sri Lanka, Sudan, Switzerland, Tunisia, Turkey, Ukraine, United Arab Emirates, United Republic of Tanzania, Bolivarian Republic of Venezuela, Vietnam, Yemen, Zimbabwe.

Abbreviations used in this record:

AIDS	acquired immune deficiency syndrome
CANDU	Canada deuterium-uranium [reactor]
CDM	Clean Development Mechanism
CRP	coordinated research project
CSD	Commission on Sustainable Development
CSD-14/15	Fourteenth/fifteenth session of the United Nations Commission on Sustainable Development
CT	computed tomography
Euratom	European Atomic Energy Community
GEF	Global Environment Facility
GIF	Generation IV International Forum
GNEP	Global Nuclear Energy Partnership
GRULAC	Latin American and Caribbean Group
HIV	human immunodeficiency virus
INDAG	International Nuclear Desalination Advisory Group
INIS	International Nuclear Information System
INPRO	International Project on Innovative Nuclear Reactors and Fuel Cycles
ITER	International Thermonuclear Experimental Reactor
LEU	low-enriched uranium
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

Abbreviations used in this record (continued):

PACT	Programme of Action for Cancer Therapy
PET	positron emission tomography
PHWR	pressurized heavy water reactor
R&D	research and development
SFR	sodium cooled fast reactor
SIT	sterile insect technique
SKB	Swedish Nuclear Fuel and Waste Management Company
SMR	small and medium-sized reactor
TAPS	Tarapur Atomic Power Station
UNDP	United Nations Development Programme

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

4. Strengthening the Agency's activities related to nuclear science, technology and applications: Nuclear Technology Review 2007

(GOV/2007/3, plus related documents available on GovAtom; GOV/INF/2007/2)

1. The CHAIRMAN recalled that, on the recommendation of the relevant Agency standing advisory groups, the Secretariat was now producing the Nuclear Technology Review as a full version with annexes on an annual basis and was no longer distinguishing between full versions and updates.
2. Mr. BURKART (Deputy Director General for Nuclear Sciences and Applications) introduced document GOV/2007/3 containing the draft Nuclear Technology Review — 2007. The Review informed Member States of significant developments and trends in nuclear science and technology in accordance with General Conference resolution GC(50)/RES/13. It outlined the status of peaceful uses of nuclear energy around the world, as well as the technological standing of nuclear power and nuclear science applications. While the Agency was involved in many of the activities discussed therein, the Review was not intended to be a list of Agency activities, and its relatively limited scope made it impossible to cover all trends and developments. Still, its approach remained broad-based, enabling the Agency to present a wider perspective to Member States that was also as forward-looking as possible.
3. Specifically regarding applications of nuclear techniques in pursuit of the United Nations Millennium Development Goals, the Review highlighted notable developments in his Department's programmatic areas while taking into account prior input from Member States so as to address their needs better. Overall, the many trends discussed illustrated the potential impact of those techniques and their capacity to enhance socio-economic development. Whether that was accomplished by advancing best practices in agricultural production, promoting better human health, advising on the management of water resources and the marine and terrestrial environments or improving industrial production processes and output, the Review showed that progress in the development and implementation of those techniques could bring considerable and concrete benefits to Member States.
4. To further augment the usefulness of the document, three technical reports were included that addressed applied nuclear science topics of particular current relevance. Those additional reports, which were available on GovAtom and would later be appended to the printed version of the document, were entitled: "Using Isotopes to Understand the Oceans and Climate Change", "Water Use Efficiency in Agriculture: The Role of Nuclear and Isotopic Techniques", and "Radiopharmaceuticals: Production and Availability".
5. He would welcome proposals for such additional material for future editions of the Nuclear Technology Review.
6. Mr. SOKOLOV (Deputy Director General for Nuclear Energy) introduced the part of the Review relevant to nuclear power applications, which covered developments and trends in nuclear power in areas of interest to many Member States, particularly developing ones. In 2007, unlike 2006, the Review did not address the challenges a developing country might face in introducing nuclear power, such as infrastructure development and financial issues. Instead, the Secretariat's current views on the subject were set forth in document GOV/INF/2007/2, entitled "Considerations to launch a

nuclear power programme”, which could be helpful as a guide for countries considering the future use of nuclear power.

7. In response to requests for more information, two tables had been included in the Review on the power level and functional status of research reactors in different regions, and additional documentation had been provided on GovAtom to cover trends in SMRs, reactor fuel performance, the development of radiation-resistant materials, and progress in the consideration of energy issues in the context of sustainable development, including information on CSD-14 and CSD-15.

8. On 26 February 2006, the Secretariat had organized a briefing on the Review, and it appreciated the comments and advice received. Any additional comments should be sent to the Secretariat in time for the necessary updates to be included in the final version of the Review for the General Conference in September.

9. Mr. ELDIN ELAMIN (Sudan)*, speaking on behalf of the Group of 77 and China, said that in its future programmes the Agency should elaborate appropriate strategies to counter obstacles to the projected steady growth in nuclear power’s share of global energy generation.

10. The Agency could play a proactive role at CSD-15 in New York in May 2007. In cooperation with the international community, the Secretariat should explore the possibility of including nuclear power among the options for reducing emissions within the CDM.

11. The Group noted with satisfaction the growing membership of INPRO, and it supported its Phase 2 activities. It also encouraged complementary efforts between INPRO and the GIF initiative.

12. While recognizing that substantial uranium resources were likely to be available, the Group was concerned about the significant increase in their price. The Agency should make every effort, including through coordinated research projects and regional technical cooperation programmes, to address issues related to mine development and to improvement of fuel performance, with longer dwell times and higher average burnup, bearing in mind the cost-benefit factor.

13. With regard to the management of waste from spent fuel, the Group noted with satisfaction that there was a high level of confidence in both wet and dry storage technologies and their ability to cope with rising volumes pending implementation of final repositories for high-level waste.

14. The Group welcomed developments on SMRs in the context of both power and non-power applications. It supported all Agency activities envisaged in that area and believed that, to the extent possible, the Agency should facilitate technical, legal, regulatory and financial assistance to developing countries with small electricity grids that were planning to introduce nuclear power as part of their energy mix.

15. The Group noted with interest the developments under the ITER project and asked to be kept periodically informed of progress made. It also noted the activities relating to advanced fission and fusion and looked forward to an evaluation of several types of reactor which would project nuclear power as an inherently safe, environmentally benign and economically viable source of energy for sustainable development.

16. The Group appreciated the Agency’s efforts to promote nuclear knowledge management and urged it to give greater assistance to Member States, and developing ones in particular, in preserving nuclear knowledge and meeting their education and training needs. INIS was playing an important role as a knowledge management tool for the broad dissemination of the information needed to ensure safe utilization of the peaceful applications of nuclear technology.

17. The issue of assurances of fuel supply was a complex one. A phased approach to it would probably be required, and associated technical, legal and financial aspects would also have to be considered in depth. It was premature for the question to be taken up by the Board before various aspects and concerns had been adequately addressed.

18. The primary objective of the Nuclear Technology Review was to highlight notable developments in nuclear technology during the year; any reference to non-proliferation was out of place. Undue concerns about proliferation should not hamper the development of nuclear science and technology for the socio-economic benefit of developing nations.

19. The Group noted the progress made in radiation technology and new applications and recalled that the International Meeting on Radiation Processing had been held in Malaysia from 26 February to 3 March 2006. The Group wished to highlight the increasing use of radiation processing for property enhancement and for the production of novel polymeric materials in industrial applications, as well as in health care and biotechnology, particularly in regenerative medicine and tissue engineering. The technical cooperation programme should continue to provide support to developing Member States in improving their radiation processing capability and capacity.

20. Specialized accelerators, novel techniques and improved instrumentation were being developed to meet increasing demands in materials science and biomedical research. The Group recognized the importance of research reactors for the production of radioisotopes, neutron beam applications, material irradiation for nuclear energy systems and also teaching and training for human resources development, noting inter alia the increasing use of low energy cyclotron-produced fluorine-18 for PET applications in the diagnosis and treatment of cancer. It called for the Agency's continuing support to developing Member States in providing equipment, technical expertise and capacity-building opportunities, and for increased regional collaboration and networking, more effective management, and utilization and sharing of evolving resources and expertise for research reactor applications in those areas.

21. In view of the growth in nuclear medicine and radionuclide therapy and the technically demanding requirements for radiological and pharmaceutical safety, the Agency should continue its efforts to assist Member States in meeting stringent quality assurance standards in radiopharmaceutical production. The Group appreciated the Agency's endeavours in connection with the regional meeting on good radiopharmacy practices to be held from 23 to 27 April 2007 in Shanghai, China.

22. The Group noted with interest the growing demand for the use of nuclear databases in support of nuclear applications in research, energy and the production of therapeutic radionuclides in nuclear medicine and thanked those Member States that had assisted in the Agency's efforts to compile them.

23. In the field of agriculture and nutrition, the Group was encouraged by the progress achieved in the use of isotopic techniques and mutation induction techniques for plant breeding. The Agency must continue its efforts to improve and enhance the methodology for genome sequencing, creating possibilities for increasing the number of crop varieties that were tolerant of harsh conditions. As to the improvement of livestock productivity and health through the use of stable isotopes, the Group encouraged the Agency in its work and in assisting Member States in projects on animal nutrient uptake and the optimization of feeding regimes.

24. In view of the expanding use of the SIT for the control of agricultural pests, including fruit flies and screwworm flies, the Group reiterated its view that the Agency should continue its research and assistance to Member States in the use of that environment-friendly technique to improve their crop and animal production and productivity. The Agency should enlarge the scope of the SIT to combat other insect pests, such as malaria-transmitting mosquitoes, and should also consider the use of other nuclear techniques, such as stable isotope techniques, to help in the fight against locusts.

25. On human health, the Group expected that the combined modalities for providing structural and molecular information in nuclear cardiology using hybrid PET-CT systems would continue to grow in the management of cardiovascular disease worldwide. It also noted the positive impact of new imaging techniques on diagnoses and early disease assessment, as well as their use in radiotherapy to determine accurate dose delivery to affected organs and reduce the doses received by adjacent healthy tissues.

26. In that context, the Group wished to stress the continuing importance of PACT as a fund-raising activity, equipment delivery vehicle and programme for assisting with the development of national cancer strategies in developing States through integrated missions and with the establishment of networks of cancer training centres. It thanked Member States for their financial and other contributions and pledges to PACT and called on Member States to help provide for the financial needs of the PACT Programme Office.

27. The Agency should continue to assist developing Member States with human nutrition programmes focusing on the prevention and treatment of malnutrition, such as through the use of stable isotopes for assessing body composition and measuring human milk intake in infants.

28. The Group noted with interest the efforts undertaken to understand the water cycle and climate in order to help in setting up sustainable water resource management and preservation systems. It reiterated the need for assistance and expertise in groundwater detection and management as well as desalination in order to respond to expanding global demand for fresh water, notably in those developing countries facing huge shortages, and encouraged the Agency to continue providing assistance, expertise, training and equipment to Member States.

29. On environmental issues, the Group was aware of the crucial role played by radiotracers as cost-effective tools for analysing the elemental composition of air particulate matter with a view to addressing air pollution and climate change. The Agency should also continue its work on monitoring the marine environment and marine food chains for radionuclide and toxic metal contamination to ensure the safety and quality of seafood.

30. The Agency could play a positive scientific role in addressing the negative global effects of climate change. In view of the alarming effect of the acidification of the oceans and the related decline of carbonate ion concentrations on corals in particular and marine life in general, the Group urged the Agency to help developing countries with the use of radioactive and stable isotopes and new nuclear techniques to address the challenges posed by climate change. It also requested the Secretariat to include a section in the next Nuclear Technology Review on the Agency's role in measuring the effects of climate change and its impact on sustainable development and on possible synergies with the respective scientific establishments of developing countries.

31. Mr. HIGUERAS RAMOS (Peru)*, speaking on behalf of GRULAC, said that the Group attached great importance to the many peaceful applications of nuclear techniques and their contribution to development. Nuclear technology offered many possibilities for improving quality of life and meeting challenges in the areas of human health, food and agriculture, water resources management, the environment, power generation and industry. In that connection, the Group noted the enormous task facing the Agency and Member States in meeting the goals set at the World Summit on Sustainable Development.

32. GRULAC underscored the importance of atomic and nuclear databases and their updating to ensure sound and credible analyses of nuclear applications. The Agency's promotional work in that regard was vital to elaborating and establishing quality databases, providing access to them and disseminating the knowledge they contained worldwide.

33. The Group noted the renewed interest in nuclear power and welcomed the Agency's efforts to ensure that developments in that area were accessible to all those considering nuclear power, in particular INPRO.
34. With regard to research reactors, the Group welcomed the regional cooperation and networking which had taken place and the resulting benefits in terms of improved resource management and technical knowledge, especially in connection with meeting regional needs for the production of radioisotopes. The Agency's support for further such activities in the region would be much appreciated.
35. GRULAC attached great importance to the application of isotopic and nuclear techniques in the area of food and agriculture, in particular for the identification of pollutants in soils and for pest control. In the past ten years, the application of the SIT in Argentina to combat the fruit fly had resulted in the region of Patagonia being officially recognized as a fruit fly free area. The regional project to promote fruit and vegetable exports through the establishment of low-prevalence and fruit fly free areas in Central America using an integrated technique which included the SIT had enabled the countries of the Central American isthmus to enlarge such areas, in close cooperation with the sterile fly production plant of the medfly programme in Guatemala, and a new SIT programme to control fruit flies had been started in Brazil in 2006.
36. The mass rearing facility of the Mexico–American Screwworm Eradication Commission had been supplying sterile flies for the past 30 years for all screwworm eradication campaigns carried out in Mexico, Central America and the Caribbean, and a new screwworm rearing facility had been opened in Panama in 2006.
37. Important progress had also been made in the region in research on the application of the SIT to combat the *Anopheles* mosquito — the vector of malaria — and the dengue-bearing mosquito *Aedes albopictus*, and the Group urged the Agency to continue its work in that area.
38. Given the proven effectiveness and reliability of the SIT and its contribution to alleviating health and productivity problems in developing countries, the Secretariat should work on solutions to the difficulties which were being encountered in connection with the reloading of existing radiation sources and the acquisition and international shipment of new sources.
39. The Group also welcomed the Agency's work on increasing the capacity for growing improved varieties of crops in the Andean areas of Peru to enhance food security for the populations there.
40. With regard to the use of radioisotopes in health, and nuclear medicine in particular, for diagnosis, therapy and dosimetry, GRULAC welcomed the most recent developments in radiotherapy and hoped to have gradual access to them with the Agency's assistance.
41. The applications of nuclear energy to the management of water resources, environmental studies and the removal of anti-personnel mines were of particular interest to the Group, and the Agency was encouraged to pursue its efforts in those areas.
42. The Group underscored the continued importance of the Agency's research and promotion work related to nuclear applications. The Secretariat and Member States should give the search for ways and means of promoting nuclear applications the same priority as they gave to other activities and should cooperate in that process through the exchange of experience, technology transfer, capacity-building and training.
43. Ms. ASHIPALA-MUSAVYI (Namibia)*, speaking on behalf of the African Group, said the growing interest of African countries in the Agency's work was proof of the increasing relevance of the Agency's technical and other programmes to sustainable development in Africa. There was a

growing demand worldwide for nuclear energy to address future challenges in sustainable development. The expansion of nuclear power could be attributed to its excellent safety record and attractiveness in terms of economics, security of supply and environmental concerns. The African Group supported the Agency's valuable work on the promotion and maintenance of nuclear knowledge, energy needs assessment, and training and expertise for setting up infrastructural and institutional frameworks for nuclear power plants and related activities.

44. The High-Level African Regional Conference on the Contribution of Nuclear Energy to Peace and Sustainable Development, held in Algiers on 9 and 10 January 2007, had highlighted the need to devote further efforts to the peaceful uses of nuclear energy and technologies. The Agency should continue to assist African countries in nuclear knowledge management and expertise to promote implementation of the plan of action adopted at the Conference.

45. There was growing interest worldwide in the Agency's INPRO project, of which some African countries were members with a view to introducing innovative nuclear systems. In addition, new steps had been made in connection with the GIF innovative reactor systems.

46. The African Group attached particular importance to research reactor activities, especially radioisotope production, neutron beam applications, irradiation for nuclear energy systems and training and human resource development. It encouraged the Agency to enhance its activities in those areas.

47. Referring to recent developments in the applications of nuclear techniques, she noted that in the diagnosis and treatment of cancer, new imaging techniques were making it possible to identify affected organs with accuracy, thus reducing radiation doses. The Agency should enhance its assistance in that area to Member States, particularly developing countries. The African Group was also interested in the use of isotopic techniques in combating pandemics and complex diseases such as HIV/AIDS, cancer, malaria and malnutrition.

48. The African Group noted with appreciation the Agency's activities under the PACT programme and welcomed its efforts to develop a comprehensive cancer control strategy for Africa and the Middle East and to expand cancer care programmes, building on established technical cooperation projects where feasible. The Group thanked its development partners for complementing its own efforts through their assistance.

49. The Group appreciated the progress made in the use of isotopic techniques to increase crop varieties and improve animal production and productivity and commended the Agency for the encouraging results gained in the use of the SIT to combat the fruit fly and the tsetse fly. The Agency should continue its research on combating other insect pests such as malaria mosquitoes and explore the possibilities of using nuclear techniques, including stable isotope techniques, to achieve an integrated approach to combating locusts.

50. Where water resource management was concerned, the African Group appreciated the efforts undertaken worldwide to understand the relationship between the water cycle and climate and welcomed the strengthening of the Agency's database, which provided Member States with an efficient tool for the assessment and management of groundwater resources, the identification of sources of pollution and the authentication of the origin of fruits and vegetables.

51. The African Group appreciated the Agency's work on using micro-imaging techniques for the microanalysis of radioactive particles in marine sediments and radiotracers in support of seafood safety. Such techniques had a positive impact in improving the marine environment and the quality of marine products. The use of nuclear analytical techniques for monitoring air pollution could help reduce particles that endangered human health and also provided a tool for assessing the effectiveness

of pollution countermeasures. The Agency should pursue its activities and assistance to Member States in that area.

52. In conclusion, she reiterated the African Group's view that nuclear technology applications were beneficial in a sustainable manner only if perceived as a means of technology transfer. No obstacles, political or otherwise, or any other unwarranted restrictions should be placed on access to nuclear technology. Both the NPT and the Agency's Statute provided for such access, and all Member States should facilitate such transfers.

53. Ms. GERVAIS-VIDRICIARE (Canada) said the section of the draft Nuclear Technology Review 2007 on power applications and the increased interest being shown in nuclear power were indicative of a 'nuclear renaissance' in which the Agency could and should play an active role. Not only should it provide objective information to decision-makers, but it should also help interested Member States to address key issues facing nuclear energy, specifically those outlined in the Review. Canada had been a sponsor of the workshop organized by the Agency in December 2006 on issues for the introduction of nuclear power, and it welcomed document GOV/INF/2007/2 on considerations for the launching of a nuclear power programme. It encouraged the Agency also to play an active role in the CSD in view of the low greenhouse gas emissions produced by nuclear energy.

54. The Review indicated that nuclear electricity generation could double by the year 2030 based on a steady increase of 2.6% per year. Canada welcomed the increased reliance on nuclear energy and looked forward to working with the Agency towards a better understanding of future trends and their implications. Canada's regulatory body had received a three-year licence renewal for the Point Lepreau nuclear power plant and was reviewing two site preparation applications for new nuclear power reactors which could result in a large increase in nuclear generation capacity.

55. The price for uranium continued to rise and was nine times the historic low recorded in 2000, mainly owing to a shortage of fresh mine output and rising expectations for nuclear power. Careful planning would be needed to ensure that future uranium supply met demand.

56. After extensive public consultations, her country's nuclear waste management organization had recommended using a deep geological repository that allowed spent fuel to remain retrievable over time. The Government was carefully studying that recommendation. It was continuing to implement the framework adopted in 1996 to ensure that safe and environmentally sound long-term solutions for spent fuel and radioactive waste were developed and applied.

57. Member States were collaborating on future nuclear energy systems through both INPRO and GIF. Under the latter, Canada was playing a lead role in the development of a supercritical water reactor. The design was based on the CANDU concept, with more efficient power production and applications for hydrogen production and desalination as well as conventional electricity generation. Atomic Energy of Canada Limited was providing a cost-free expert to the INPRO programme, whose feasibility study of nuclear power in developing countries as part of the elaboration of a common user criteria manual was of particular interest. Canada was optimistic that the Agency could identify innovative institutional and infrastructure options and new methods of financing for developing countries.

58. The Review highlighted important developments in nanotechnology and the application of nuclear techniques to food, agriculture, water management, human health and the environment. Canada was a world leader in nuclear medicine and played a major role in the development of new techniques. In the area of radiotherapy, it was the largest supplier of high-quality equipment for preventing, diagnosing and treating disease. A new liver cancer treatment had been developed and recently launched in Europe and India, and innovative treatments were being developed for brain cancer and non-Hodgkin's lymphoma. Medical isotopes made in Canada were used worldwide to

diagnose many diseases, and its sterilization technology was used on an estimated 80% of disposable medical supplies throughout the world. Canada strongly supported PACT through in-kind contributions of cancer therapy machines. On 18 January 2007, its Minister of Health had announced a contribution of 150 000 Canadian dollars for the training of cancer specialists in Tanzania as part of PACT.

59. Mr. POPOV (Russian Federation) said that the draft Review objectively reflected the situation in a number of fields of nuclear science and technology and provided insight into the global atomic energy situation and existing and projected trends in the relevant technology. Despite the decrease in global nuclear generating capacity in 2006, rising expectations for nuclear power had given new impetus to the Agency's activities in that field. Such activities would facilitate the selection and adoption of new technological solutions in line with the requirements of nuclear and ecological safety, the nuclear non-proliferation regime and cost-effectiveness. The emphasis placed on the projected growth of large-scale nuclear power and the clear delineation of the opportunities and the challenges that might be faced by its supporters would help to define the potential boundaries within which nuclear power could become an integral component of the global energy mix.

60. Against the background of the clear trend towards expansion of nuclear power worldwide, the Russian Federation was implementing the proposal made by its President, Vladimir Putin, on 25 January 2006 to create a system of international centres providing nuclear fuel cycle services under IAEA control on a non-discriminatory basis and with strict regard for the regime of non-proliferation of nuclear weapons. During the 50th regular session of the General Conference in September 2006, the Russian Federation had announced the establishment on its territory of an international uranium enrichment centre in the Irkutsk district, at Angarsk. Since then, a great deal of work had been done. In late January 2007, by a decision of the Government of the Russian Federation, the Angarsk facility had been included in the list of facilities to which Agency safeguards could be applied in accordance with the safeguards agreement of 21 February 1985 with the Soviet Union. Consultations were continuing with the IAEA Secretariat concerning the Agency's participation in the centre's activities. The Russian initiative was geared towards involving as many participants as possible. The goal was to provide a real alternative to countries that opted for a multilateral approach to the nuclear fuel cycle instead of establishing their own enrichment capabilities. Russia reaffirmed its readiness to cooperate closely with other initiatives and proposals with similar aims, including the United States' GNEP.

61. The results achieved so far by INPRO were important, and the Russian Federation was interested in further supporting the project, taking national interests into account. It welcomed the expansion of the number of participants, and had put forward a number of specific proposals for consideration. If other members of the project were interested, it might be possible to hold a meeting of experts, for example in Vienna, to analyse the technical and administrative aspects of the proposed projects. His delegation would like to see a more detailed description of the activities currently being carried out under INPRO, including collaborative efforts related to innovative nuclear energy systems and the development and deployment of small and medium-sized power reactors.

62. In accordance with General Conference resolution GC(50)/RES/13 B, his delegation expected the Secretariat, beginning in 2008, to provide a comprehensive report on the status and prospects of nuclear power containing sections devoted to the work done by the Agency on the power applications of nuclear energy and recommendations on effective measures that it could take to promote international cooperation in expanding the utilization of nuclear power technology.

63. The Agency should play a more active role in the CSD, for instance by reporting to the upcoming CSD session on the progress of international cooperation on solving the problem of radioactive waste — the most critical issue, along with nuclear safety, for ensuring sustainable development.

64. The Russian Federation was content with the way the ITER project was developing. The conclusion of agreements formalizing the establishment of the corresponding international organization would give tangible form to the project. The Agency, under whose auspices the project had been set up, must continue to play an essential role in it.

65. In conclusion, he stressed the importance of expanding non-power applications of nuclear energy for the purposes of development, including in medicine, food supply and agriculture.

66. Mr. ALBERT (France) said his country agreed with the Review's overall analysis of the context, challenges, ongoing developments and advantages of nuclear technology for electricity production. The Review also showed that research on nuclear applications was profitable for all Member States of the Agency, whether or not they had a nuclear power programme. In highlighting nuclear power projects that were being created or relaunched all over the world, the Review bore witness to the present and future prospects for nuclear energy at a time when the earth's energy future was threatened by the depletion of fossil fuels. The nuclear power option was becoming more and more viable as a means of meeting growing energy needs in a way that was safe and economically competitive and helped to combat climate change. His Government accordingly wished to reiterate its support for the Agency's role in promoting international cooperation for the development of peaceful uses of nuclear energy in Member States. It welcomed the innovative General Conference resolution GC(50)/RES/13 B which had reaffirmed that role and outlined new perspectives, including for financing, for the Agency's work on behalf of States wishing to make use of nuclear energy in a context of sustainable development. It also encouraged the Secretariat to contribute actively to the work of the CSD that was soon to meet in New York, inter alia by providing all relevant information for evaluating all the sources of energy that would be needed to meet global needs and identifying the major contribution that could be made by nuclear energy.

67. France welcomed the renewed interest in multilateral fuel cycle initiatives aimed at ensuring that nuclear power expansion worldwide remained in conformity with the requirements of non-proliferation. All existing proposals should be taken into consideration. In its thinking on the subject, his country would endeavour to promote pragmatic solutions that took account of industrial realities and fulfilled the highest requirements of safety, which were the key to public acceptance.

68. France, along with other advanced Member States, had helped finance a technical seminar organized by the Agency in December 2006 on the infrastructure required to support the safe and efficient introduction of nuclear energy in countries wishing to launch a civil nuclear programme. The seminar had helped to identify the concerns and needs, particularly financial, of Member States and to show them that the decision to launch a nuclear power programme implied responsibilities for the State, particularly in respect of security and safety, that could not be delegated.

69. France would continue to be involved in future regional and national activities relating to the Agency's infrastructure programme.

70. France currently headed the GIF, which brought together countries aware of how important it would be for the future to have new nuclear technologies representing improvements in competitiveness, safety, conservation of uranium resources, limitation of long-lived radioactive waste and resistance to proliferation. Over the past year, GIF members had signed four "system arrangements", three of them in Paris, covering the contributions of each member and relating specifically to sodium-cooled fast reactors, gas-cooled fast reactors, very high temperature gas-cooled reactors and supercritical water-cooled reactors. The next step would be "project arrangements" allocating technological options to be developed on the basis of calls for bids. France welcomed the fact that China and the Russian Federation had joined the GIF. It would continue its efforts, together with its partners, to promote and organize operational international cooperation in an equitable manner

so as to produce the 'technological building blocks' that would make up the nuclear power industry of the future.

71. In that context, France planned to bring online around 2020 a fourth-generation fast reactor. The prototype, which was open for international cooperation, would be extremely useful for validating the GIF's initial results and the relevance of its approach. France was also participating in INPRO, which served as an open international institution for the study of nuclear power options and could make particularly interesting contributions in the area of evaluation methodologies. Moreover, the ITER was to be built in Cadarache, France; research in controlled nuclear fusion was making steady progress, and the signature by the ITER parties in November 2006 of new agreements was a further sign of the viability of the programme.

72. France was providing substantive support to one of the Agency's landmark projects involving the use of the SIT to combat malaria in Africa. The procedure, which was particularly environment-friendly, had quickly yielded results in terms of health conditions and, more generally, economic development. It was an excellent example of the use of nuclear technologies as an alternative to conventional methods. France wished to continue its cooperation with the Agency in that area. It had recently invited a high-level Agency delegation to engage in scientific discussions on the feasibility of using the SIT to combat chikungunya in the Indian Ocean as part of a comprehensive programme to control the mosquito that transmitted the disease, which had caused a catastrophic epidemic in 2006 in that region.

73. Referring to PACT, he said that France had established a coherent and ambitious national action plan against cancer and would work to promote partnerships with the Agency on that important issue, particularly in the area of radiotherapy, where it already supported numerous technical cooperation projects. It had contributed US \$100 000 to PACT in October 2006.

74. Mr. PARK Chung-Taek (Republic of Korea) said that although the draft Nuclear Technology Review 2007 reflected the activities in nuclear energy around the world during the preceding year, there was still room to improve it. He encouraged the Secretariat to address, in particular, the trends in nuclear activities and an overall vision which could help senior policy-makers or policy experts better to understand the contribution of nuclear energy applications. In that regard, he suggested that the Review should also consider nuclear R&D activities in Member States.

75. A notable increase in plans for the expansion of nuclear power had been observed in 2006 and he expected that trend to continue. He asked the Secretariat to continue assisting Member States in meeting their growing needs.

76. The Agency's INPRO programme was appropriate for meeting future nuclear energy demands and enhancing current safety levels and proliferation resistance criteria. With that in mind, the Republic of Korea had been contributing to INPRO and would spare no effort in continuing to do so.

77. Referring to General Conference resolution GC(50)/RES/13 B on the subject, he noted the new INPRO task on common user criteria and actions for development and deployment of nuclear power plants for developing countries. The first stage of establishing the common user criteria in 2007 would cover the general technical and economic characteristics of an innovative nuclear reactor, the associated infrastructures and institutional factors. The outcomes from the INPRO methodology studies could serve as a foundation for establishing the criteria.

78. During the INPRO Steering Committee meeting in December 2006, it had been suggested that a number of CRPs could be considered in Phase 2 of INPRO. He urged the Secretariat to expedite their effective implementation, in which case his country would be willing to contribute both financially and in kind.

79. Fast reactors were one of the most promising nuclear options for electricity generation, as they utilized uranium resources efficiently and reduced radioactive waste. The Republic of Korea had commenced SFR technology development efforts in 1992. Based on the outcomes of those R&D activities, the Korea Advanced Liquid Metal Reactor KALIMER-600 had been one of the candidate plants for an SFR in the Generation IV Technology Roadmap. With that in mind, he proposed adding the following paragraph to section B.1.4 of the Nuclear Technology Review 2007:

“In the Republic of Korea, basic fast reactor technologies and the advanced fast reactor concept called KALIMER-600 have been developed by the Korea Atomic Energy Research Institute. The conceptual design of KALIMER-600 was completed in 2006, and the sodium cooled fast reactor (SFR) technology development will enter a new phase in the Generation IV SFR collaboration project.”

80. Mr. MACGREGOR (United Kingdom) said that his country fully supported efforts to develop a multilateral framework to ensure that States that wished to could pursue a nuclear power reactor programme with confidence in future supplies of fuel without the need to develop expensive and proliferation-sensitive enrichment and reprocessing technology. Those efforts would not only facilitate the use of nuclear electricity production for energy security and climate change reasons, but also reduce proliferation risks by limiting the spread of technology that could be used to produce nuclear-weapons-usable material. They therefore served to reinforce the relevant provisions of the NPT, in particular Articles I, II and IV. For that reason, the United Kingdom had been one of the six States sponsoring the initiative on reliable access to nuclear fuel in June 2006.

81. At the special event on assurances of supply and non-proliferation held during the General Conference the preceding September, the United Kingdom had presented the enrichment bond proposal — an idea developed with its colleagues from Germany and the Netherlands — which was now being considered by the Secretariat along with other proposals presented during that event. He looked forward to receiving the Secretariat’s first proposal on the subject for detailed consideration by the Board in the near future with a view to developing the ideas into a system ensuring the strongest possible guarantees of supply and the highest non-proliferation credentials for participants while not distorting the normal commercial market, which had worked successfully to date.

82. The Nuclear Technology Review 2007 made reference to the construction of new enrichment plants at the National Enrichment Facility in the United States and at the Georges Besse II plant in France, both with Urenco involvement. The plants were being built to replace existing facilities and supplement capacity for well-established consumer demands.

83. Recent developments in radioisotope applications were vitally important to improving health care throughout the world. Techniques involving isotopes with shorter half-lives required correspondingly fast distribution of products, yet barriers and limitations to such distribution were increasing. The Agency should, once again, stress the need to remove barriers to transport. Its action plan on denial of shipment was key to ensuring the widest availability of those new, ground-breaking health products.

84. The United Kingdom’s Committee on Radioactive Waste Management, tasked by the Government to devise a strategy to deal with his country’s legacy waste, had presented its report, concluding that deep geological disposal in a repository was the best available approach for long-term waste management but that an interim storage programme was also required. In its response to the report, the Government had accepted that geological disposal, coupled with safe and secure interim storage, was the right way forward for the long-term management of the United Kingdom’s higher-activity waste. An implementation framework was being developed which would put forward proposals for advancing geological disposal and which would be published for public consultation in

the summer of 2007. In addition, the Committee was being reconstituted to provide ongoing independent advice to the Government on the implementation of geological disposal.

85. Referring to the United Kingdom's energy review process following the recent court judgement that the Government's consultation exercise on nuclear energy preceding the Energy Review Report had not been adequate, he said that the Government had accepted the court's judgement and would not appeal. It was now more likely that the publication of the Government's White Paper on Energy Policy, as well as new nuclear consultation, would take place in early May, if not sooner. People in the United Kingdom should be able to take an informed view on whether nuclear power should continue to be part of the country's energy mix. That would enable the Government to make a decision on nuclear power alongside other aspects of the energy review later in the year. Subject to that consultation, his Government continued to believe that there was a case for new nuclear power stations to be one of the options considered by energy-generating companies, not least because of their potentially very significant contribution to security of supply and to reducing carbon dioxide and other greenhouse gas emissions.

86. Mr. ARÉVALO YÉPES (Colombia) said that technological development over the past 50 years had demonstrated the benefits of nuclear energy and its immense possibilities for application in areas fundamental to development such as food and agriculture, livestock productivity and health, industry, human health, water and the environment.

87. He particularly emphasized radioisotope applications in health, nuclear diagnostic medicine and radionuclide therapies as well as the use of radiation for polymer grafting in medicine and biotechnology. He further highlighted the progress made in nuclear cardiology and radiotherapy and the importance of disseminating information on advances in those areas and engaging in cooperation for their broad application.

88. It was a great challenge to make new technologies and treatments available to developing countries and to support them in implementing the national health infrastructures they needed. Agency cooperation in that area was of fundamental importance and he hoped that it would increase at the rate required. It was also important that those priorities be reflected in the Agency's budget.

89. Research into using the SIT to fight the malaria-carrying *Anopheles* mosquito and other insects which transmitted viral diseases such as dengue was of great value and the utility of the technique had been amply demonstrated. The Agency should continue to work with countries such as France which were directly interested in promoting the applications for disease control and should expand its scope of action to include both tropical and subtropical areas in Colombia which were struck by insect-borne diseases.

90. Isotopic techniques used to track soil pollutants and the use of nuclear technologies to ensure food safety were also of great importance, as was the application of nuclear techniques in the areas of nutrition, water resources and environmental protection. The Agency's work should focus on promoting the applications and furthering research.

91. Research reactors were important in the production of radioisotopes, and he thanked the Agency for its assistance in opening and operating Colombia's research reactor and in broadening its applications.

92. Referring to the section of the draft Review on proliferation resistance (paragraph 47), he said that the seven steps proposed by the Director General at the 2005 NPT Review Conference, while not all directly related to nuclear energy, represented a very important strategic element in promoting the safe development of the nuclear fuel cycle.

93. The application of nuclear technology for the detection of anti-personnel mines was of particular interest to Colombia for humanitarian reasons, and the Agency's support for its national project in that area was appreciated. He hoped the Agency would continue to provide assistance for developing the project and for future activities in that area whose success would prevent many deaths and serious injuries. He requested that the state of the art in that technology be described in the Nuclear Technology Review 2008.

94. Technological advances had considerably broadened the scope of peaceful nuclear applications which were fundamental to development. As the benefits increased, the importance of the Agency's role and responsibility in transferring peaceful nuclear knowledge and technology also grew. He called upon the international community to focus its efforts and resources on those peaceful uses and upon the Agency to continue broadening its cooperation to increase the number of those benefiting from them. Peaceful nuclear applications and universal access to them through cooperation also constituted the best strategy against proliferation.

95. Mr. SHARMA (India) said that document GOV/2007/3 and the additional documents available on GovAtom provided a good global perspective on nuclear technologies for both power and non-power applications and an indication of future trends.

96. He noted that the average annual growth rate for nuclear power capacity over the preceding two decades had been 1.5%, while the figure for nuclear electricity generation over the same period had been almost double that at 2.9%, reflecting the improved performance of nuclear power plants, increased capacity factors, and better fuel performance and reliability. The Review projected that future growth would be centred in Asia, mostly in India and China.

97. India was rapidly increasing its nuclear power capacity to meet growing electricity demand. With the Kaiga-3 unit going critical in February 2007, India now had 17 operating nuclear power reactors with a total installed capacity of 4120 MW(e). Six more, including a prototype fast breeder reactor, were under construction, with a total capacity of 3160 MW(e). In 2006, TAPS-3, a 540 MW(e) PHWR, the largest electrical power generating unit in the country, with a totally indigenous design, had been synchronized to the grid. The experience gained from TAPS-3 and 4 was being utilized for up-rating the unit size to 700 MW(e). Four such 700 MW(e) units were proposed for construction, two in Rajasthan and two in Gujarat. The development of the Advanced Heavy Water Reactor, with several passive safety systems and optimized to use thorium fuel, was progressing rapidly.

98. The CSD-15 meeting in New York in May 2007 would provide an opportunity for the Agency to take a proactive role in promoting nuclear power as a viable and essential option for sustainable energy development, which would complement what CSD members were doing in their national capacity and would conform to the resolution on nuclear power applications adopted by the General Conference in 2006.²

99. India welcomed the increase in INPRO membership to 28, looked forward to the successful implementation of its Phase 2 activities and encouraged all complementary efforts such as GIF. It had co-sponsored the Agency-organized workshop in December 2006 on issues for the introduction of nuclear power.

100. With regard to SMRs, he was pleased to note that about a dozen innovative designs promised to be ready for deployment within the next decade, which would provide interested countries with several potential choices. India was currently developing a Compact High Temperature Reactor to

² GC(50)/RES/13 B.

generate about 100 kW(th) with several advanced passive safety features that would allow its operation as a technology demonstrator for a larger compact power pack to be used in remote areas not connected to the electrical grid. It would also facilitate the demonstration of a technology for high-temperature process heat applications such as hydrogen production by splitting water. The reactor was ²³³UTh fuelled, lead-bismuth cooled and beryllium oxide moderated and was designed to operate at 1000°C.

101. India took note of and welcomed all developments under the ITER project and supported all Agency initiatives towards ensuring the realization of its objectives.

102. With regard to the non-power applications of nuclear techniques in food, agriculture, human health, nuclear medicine, industry, water resources management and the marine environment, his delegation found the Review's coverage to be comprehensive and informative. Those activities constituted the basis for the unique Atoms for Peace organization which the Agency had become, as they had a direct, visible and measurable impact which benefited society. India supported all activities envisaged in those areas and was committed to providing expert services and organizing training courses, fellowships and other in-kind support to the Agency.

103. Mr. TANG Guoqiang (China) said that the Review provided comprehensive information on progress in the use of nuclear technology in the world and on the current status and development trends of global nuclear technologies. It would be a highly valuable reference for Member States, and China would continue to support the Secretariat in collecting and compiling information for it.

104. The field of nuclear power had experienced a continued surge of activity in 2006, with China and some other countries adopting large-scale plans for its development. Some developing countries were considering building small and medium power reactors to achieve a guaranteed and stable power supply. Nuclear power as a clean energy source which could serve to promote sustained socio-economic development was receiving ever-increasing attention and was widely viewed as having good future prospects.

105. In March 2006, the State Council of China had adopted medium- and long-term plans for nuclear power development, and in December the international bidding programme for China's nuclear power projects had achieved new progress. China would continue to conduct R&D on advanced water reactors and would actively participate in international cooperation projects such as INPRO and ITER. China had also signed the GIF Charter in November 2006.

106. The Chinese Government actively supported the Agency in its continued nuclear power activities and believed that they would positively impact the promotion of sustainable development. It hoped that the Agency, as nuclear power expanded worldwide, would focus on the real needs of Member States and give full play to its own strengths by optimizing the deployment of its resources, increasing its technical support and providing better services to Member States, in particular to developing countries.

107. China commended the Agency for its contribution to R&D on advanced reactors and was prepared to conduct joint research on advanced nuclear power and fuel cycle technologies within a multilateral framework.

108. In 2006, the Agency had continued its activities to promote the application of nuclear technology in non-power fields, achieving remarkable socio-economic benefits. The progress attained in food and agriculture, human health, radiation technology and nuclear medical diagnosis and treatment had been particularly impressive. PACT had gained extensive support from the majority of Member States, especially developing countries. China would continue to support the Agency in its activities related to research reactors, accelerators and seawater desalination as well as nuclear

applications in food and agriculture, human health, water resource management and environmental protection.

109. Food and agriculture and human health were the areas of greatest need for developing countries' socio-economic growth, and China hoped that the Agency would continue to give priority to balanced development in those fields, while expanding its activities in other areas.

110. Mr. VALLIM GUERREIRO (Brazil) said that document GOV/2007/3 and the additional documentation provided a global perspective and a good and positive analysis of the status of nuclear technology and its uses.

111. Nuclear power would assume increasing importance in meeting the medium- and long-term demand for electricity on an economically competitive and environmentally sound basis, and international cooperation initiatives such as INPRO and GIF played an important role in that regard. Brazil supported and actively participated in both programmes and welcomed the adherence of new countries to them. Considering that INPRO and GIF had the same objectives and used the same criteria to assess innovative nuclear energy systems, Brazil reiterated its request that enhanced cooperation and exchange of information between the two initiatives be sought.

112. With regard to the section of the Review on fusion, the Agency's initiative to keep abreast of ITER developments was positive and encouraging. It would provide an important channel for members of the Agency that were not ITER partners to share in the most recent developments taking place regarding nuclear fusion.

113. While it supported the general terms of the Reduced Enrichment for Research and Test Reactors (RERTR) Programme referred to in paragraph 84 of the Review, Brazil emphasized the need for the international community and the Agency to concentrate their efforts on developing the technology to produce and qualify high-density LEU fuel and transferring the technology to developing countries. Brazil's National Nuclear Energy Commission had been working through its research institutes on the development of high-density fuel using uranium-silicon and uranium-molybdenum alloys and considered international cooperation to be important in achieving its objective.

114. He was pleased to note from paragraph 40 that the decommissioning of a number of nuclear sites had been successfully completed, showing that many of the fears raised about the future of nuclear installations once their life span had run out were not always justified.

115. Brazil attached great importance to the production and use of radioisotopes, particularly for medical purposes. The National Nuclear Energy Commission, through its research institutes, produced radioisotopes and radiopharmaceuticals allowing more than 2.3 million medical procedures to be performed each year. With the objective of improving the standard of living and expanding the use of modern nuclear medical techniques in line with the international trend mentioned in sections E.1 and G.1 of the Review, several PET centres were being established in Brazil. In view of the short half-life of the radioisotopes involved and in order to spread the benefits to different areas of the country, the National Nuclear Energy Commission was decentralizing the production centres by establishing two new cyclotrons, one in Belo Horizonte and one in Recife. In addition, the production capability of the cyclotrons located in São Paulo and Rio de Janeiro was being enhanced. Brazil hoped that the Agency would support the programme through its Departments of Technical Cooperation and of Nuclear Sciences and Applications.

116. The use of nuclear techniques in industry, particularly process monitoring, was another area of key importance to Brazil. The National Nuclear Energy Commission was developing computer tomography technology to measure spatial distributions inside processing vessels and pipelines and hoped for Agency support in that area too.

117. Brazil had been developing programmes using nuclear techniques to enhance the quality and production of agricultural goods for both domestic and foreign markets. The Ministry of Agriculture was establishing an integrated system to control fruit flies using the SIT, and a facility for the production of sterile flies had been inaugurated in September 2006, with the support of the Agency, the UNDP and several national development institutions. The facility was intended to produce 100 million sterile males per week initially, contributing to the expansion of commercial fruit production in irrigated areas of the São Francisco River basin, in the arid north-eastern region of the country.

118. Mr. SCHULTE (United States of America) said that his country strongly supported the expansion of civil nuclear power to meet rising global demand for energy without emitting greenhouse gases, thus promoting economic prosperity and development while protecting the environment. However, the expansion of nuclear power must be safe and secure and must not contribute to the proliferation of nuclear weapons or dangerous technologies. In that regard, his delegation looked forward to detailed recommendations from the Secretariat on multilateral assurances for reliable access to nuclear fuel for consideration by the Board.

119. The rapidly growing use of nuclear power to generate electricity and the fact that nuclear power plants worldwide were operating for longer periods with fewer unplanned shutdowns than ever before were attributable to the industry's strong commitment to safety.

120. The United States expected its use of nuclear power to grow. Its Nuclear Regulatory Commission had been advised of orders for 30 new nuclear power plants, and in 2006 had issued a licence for a commercial nuclear facility for the first time in 30 years. The new facility — a uranium enrichment plant in New Mexico — was a multinational nuclear fuel cycle facility that would help to foster nuclear power growth in the United States.

121. His country welcomed the potential expansion of nuclear power to developing countries and was pleased to note that the Nuclear Technology Review 2007 addressed for the first time the role of nuclear power in sustainable development. Nuclear power would enable both present and future generations to meet their sustainable development needs. His delegation encouraged the Secretariat and interested Member States to engage actively in explaining the positive role of nuclear power at the upcoming CSD meeting.

122. The Agency's workshop on issues for the introduction of nuclear power in December 2006 had been an important step in helping countries to implement nuclear power programmes while meeting the highest standards of safety, security and export control and ensuring non-proliferation. In addition to co-sponsoring the workshop, his country had pledged \$100 000 at the December 2006 meeting of the INPRO Steering Committee for establishing common user criteria for small and medium-sized reactors, which could be particularly suitable for developing countries.

123. The United States Department of Energy's GNEP had been established in 2006 to encourage the worldwide expansion of nuclear power while discouraging the spread of sensitive technologies. Under GNEP, the United States, in partnership with France, Japan, Russia and other countries, planned to develop advanced technologies for recycling spent nuclear fuel without separating plutonium and advanced reactors that consumed transuranic elements from recycled spent fuel. Deployment of such advanced fuel cycle technologies would substantially reduce nuclear waste and simplify its disposal. In addition, GNEP sought to establish reliable cradle-to-grave nuclear fuel services, including assured supply of fresh fuel and take-back of spent fuel. International research cooperation under GNEP was progressing well.

124. The United States continued to support projects on nuclear technology applications in the areas of health care and nutrition, water resource management, food security and sustainable development in

general through technical cooperation programmes in more than 100 Member States. Welcoming the progress achieved in the use of the SIT, he said that the United States had provided significant extrabudgetary support for both tsetse fly eradication in Ethiopia and fruit fly eradication in Central America. In addition, in 2006 the United States Department of State and the National Cancer Institute had provided \$500 000 and \$200 000, respectively, to support PACT. In April 2006, the Argonne National Laboratory had hosted an IAEA course on advanced isotope methods for groundwater age dating. The United States had also provided cost-free experts for SIT programmes and PACT and funded numerous fellowships for scientists from developing countries.

125. Since the Agency would be launching a separate report on nuclear power in 2008, future Nuclear Technology Reviews could focus exclusively on non-power applications of nuclear technology, thus facilitating in-depth treatment of both areas. Meanwhile, his delegation would provide the Secretariat with specific comments on the draft Nuclear Technology Review 2007 at a later date.

126. Mr. GAISENAK (Belarus) welcomed the Agency's efforts to support nuclear power programmes and to ensure the safety and reliability of nuclear power worldwide. The Government of Belarus was considering the possibility of a nuclear power programme as one of several options for the further development of the national energy sector with a view to ensuring sustainable economic growth; it therefore attached great importance to dialogue with the Agency on all matters relating to the launch of such a programme. Since Belarus was one of the countries worst affected by the Chernobyl disaster, it was anxious to ensure that all issues associated with nuclear power were discussed comprehensively with the methodological, technical and other support of Agency experts.

127. Drawing attention to paragraphs 2 and 26 of the draft Review, he pointed out that the references to a working plan for the construction of his country's first nuclear power plant to follow the expiration of a 10-year moratorium on nuclear construction should be amended, since the Government had not yet drawn up a working plan as such. The Government's final decision as to whether or not to launch a nuclear power programme would be based on further consideration and assessment of the viability of the nuclear power option in Belarus. His delegation would submit proposals for the specific wording of those parts of the text referring to Belarus.

128. The Agency was the only forum for maximally beneficial international cooperation in the use of nuclear technology and therefore played a special role in ensuring equitable access by all interested countries to advances in nuclear science and the benefits of nuclear energy in general, building on the success of mechanisms already existing for that purpose, such as INPRO. In that context, his delegation attached great importance to new approaches to the nuclear fuel cycle which aimed to establish an assured supply of nuclear fuel and looked forward to considering the Secretariat's suggestions for such approaches on the understanding that they should facilitate the establishment of a multilateral framework for the assurance of nuclear fuel supplies that was equitable and accessible to all users of nuclear energy for peaceful purposes.

129. Mr. ALI (Pakistan), expressing his country's appreciation to the Secretariat for producing the draft Review and the accompanying documents on GovAtom, said that the developments and trends covered were of great importance to developing countries and that the information provided had, over the years, been of great use in helping Member States to formulate their national programmes relating to the application of nuclear science and technology for socio-economic development.

130. Pakistan planned to increase the share of nuclear power in its national energy mix from 3.3% in 2005 to 8% in 2030. It was already manufacturing fuel for the Karachi nuclear power plant and planned to develop capacity for manufacturing fuel for other reactor types also. In parallel with

nuclear fuel cycle development, it had established an extensive programme for the application of nuclear technology and radioisotopes in agriculture, hydrology and the medical and industrial sectors.

131. Pakistan valued highly the Agency's efforts to coordinate and disseminate information on the latest developments in nuclear power technology. It had benefited greatly from the Agency's technical cooperation programme, particularly in terms of socio-economic development, and had been sharing its own knowledge and experience with interested Member States under that programme. It was also participating actively in INPRO and INDAG.

132. Mr. KASSEM (Egypt) said that while the continuing growth in nuclear power applications worldwide demonstrated the positive contribution of nuclear technology to development, particularly in view of the ever-increasing cost of fossil fuels, it was troubling that such activities remained confined to a very limited number of countries, and that in some geographical zones nuclear applications and technologies were neither available nor planned for the future. The Agency should therefore step up its efforts to help with technology transfer and best practices in the area of nuclear power. In view of the rising demand for nuclear power and technology for peaceful applications, it was also important, however, to explore all possible means of responding to the constant increase in the price of uranium so as to ensure that developing countries were able to meet their future uranium needs. In that regard, his delegation reiterated its request to the Secretariat to prepare a detailed study on world markets for uranium ore.

133. In addition, joint efforts should be undertaken to raise public awareness regarding the limited risks associated with the use of nuclear reactors and the safety mechanisms that were in place to minimize such risks.

134. Egypt attached particular importance to the management of nuclear knowledge, which played a vital role in ensuring the ability of future generations to pursue R&D activities relating to nuclear science and applications, and his delegation therefore greatly appreciated the Agency's efforts aimed at training human resources in the area of nuclear science and technology, particularly in developing countries.

135. It was important that any initiatives for assurances of nuclear fuel supply should take into account the right of all States to develop their nuclear capabilities independently on condition that they complied with the non-proliferation regime and provided the international community with all necessary assurances as to the peaceful nature of their nuclear programmes. Egypt shared concerns that some current initiatives set out preconditions which were not in keeping with legal commitments under the NPT and the Statute or other legal instruments. Such preconditions paved the way for discrimination among Member States, enabling those countries that monopolized nuclear technology to subject others to certain conditions by controlling the market for nuclear fuel. The legal and political aspects of such initiatives should be discussed before any decision was taken to implement them. His delegation endorsed the view of the Group of 77 and China that political matters relating to non-proliferation and safeguards should not be covered by the Nuclear Technology Review, which, as a technical document, should focus on developments in nuclear technology.

136. While welcoming the information provided by the Secretariat in document GOV/INF/2007/2, he noted, with regard to paragraph 47, that the additional protocol was a voluntary instrument linked with a comprehensive safeguards agreement.

137. Egypt welcomed the Agency's work in the area of cancer therapy and encouraged greater efforts to reinforce PACT, for which continued funding was essential.

138. Egypt was cooperating closely with the Agency in the area of water resource management and in that regard welcomed the Agency's ongoing efforts to cooperate with the GEF and the UNDP to

ensure that the project on the formulation of an action programme for the integrated management of the shared Nubian aquifer was pursued in collaboration with Chad, Libya and the Sudan.

139. Ms. MELIN (Sweden) said that current proliferation concerns highlighted the need for an international arrangement that would provide assurances of nuclear fuel supplies for peaceful uses of nuclear energy, possibly drawing on the useful suggestions regarding new approaches to the fuel cycle put forward at the special event on assurances of nuclear supply and non-proliferation at the 50th regular session of the General Conference. The establishment of a multilateral framework accessible to all users of nuclear energy was a complex endeavour that would probably require a phased approach, but the Agency should initiate that process without further delay. Sweden looked forward to studying the proposals for follow-up to the special event to be presented to the Board by the Director General in 2007.

140. Sweden was particularly interested in the back end of the fuel cycle. The Government was considering an application submitted by the Swedish Nuclear Fuel and Waste Management Company (SKB) in November 2006 to construct an encapsulation plant for spent nuclear fuel, which represented an important step towards construction of a deep geological repository for final disposal of spent nuclear fuel. Site investigations for the repository were being carried out in two municipalities with nuclear power plants in operation, and an application to construct a final repository in one of those municipalities was expected to be submitted by SKB in late 2009.

141. Sweden attached great importance to the use of nuclear technology in the areas of human health, food and agriculture, water resource management and protection of the environment. Many of those applications were of benefit to developing countries in particular and contributed to sustainable development.

142. Mr. SANDTNER (Germany) said that the global development of nuclear power and other nuclear applications posed new challenges in terms of safety, security and non-proliferation, and therefore required long-term planning along the lines of the United States' GNEP. Any expansion of nuclear power generation would require the establishment of adequate scientific infrastructure in the countries concerned, together with increased international cooperation. Furthermore, the general public must be fully informed of issues arising from nuclear energy use, especially if new technologies such as fast or high-temperature reactors were introduced. The respective roles of the Agency and of regional systems such as Euratom and their cooperation with Member States would be of increasing importance in that context.

143. Regarding the final disposal of radioactive waste, he said that Germany was not progressing as quickly as previously expected towards developing and constructing a repository for radioactive waste from civil nuclear power generation.

144. Referring to current scientific efforts in the areas of nuclear fission and fusion, he expressed his appreciation to the Agency for facilitating international scientific cooperation and acting as depositary for agreements relating to the ITER project, which presented a unique scientific challenge.

145. Concerning the proliferation aspects of the nuclear fuel cycle, his delegation hoped for fresh inputs and impulses from the discussions that were expected to take place regarding multilateral approaches.

146. In conclusion, he said that consideration should be given to possible ways of raising public awareness of the Agency's activities relating to nuclear applications.

147. Mr. AMANO (Japan) said that his country was promoting R&D and knowledge management in the nuclear power area on the basis of its 2005 mid-term framework for nuclear energy policy, in which it had reaffirmed its commitment to the use of nuclear energy as a major source of electricity.

148. The role of the Agency was vital in ensuring that full consideration was given to non-proliferation, security and safety issues as well as to sustainable development and the reduction of greenhouse gases when promoting the use of nuclear power. In addition, cutting-edge technology must be developed to ensure non-proliferation, the efficient use of nuclear fuel and minimization of nuclear waste. To that end, Japan was actively pursuing R&D activities relating to the next generation of nuclear reactors and the fuel cycle, and was also promoting international cooperation in those areas.

149. Japan, as a GIF member, was a leader in the development of liquid metal cooled reactors. Cooperation in the development of the proliferation-resistant fuel cycle was of great interest to Japan, given its experience in and knowledge of safeguards and the nuclear fuel cycle. Japan was also supporting INPRO with both financial and human resources.

150. Japan strongly supported the Agency's efforts in promoting nuclear science and technology as tools in addressing sustainable development and other global issues such as energy, greenhouse gases, climate change, poverty, clean water and the environment.

151. The Government of Japan had provided a portion of its cash surplus from the 2005 Regular Budget, totalling \$345 000, as a contribution to PACT, and had provided a cost-free expert to the PACT office. It hoped its contributions would have a positive impact on the peaceful use of nuclear energy in the area of human health.

The meeting rose at 1 p.m.