

TECHNICAL COOPERATION REPORT FOR 2005

REPORT BY THE DIRECTOR GENERAL

GC(50)/INF/4

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PREFACE

The Board of Governors has requested the transmission to the General Conference of the attached Technical Cooperation Report for 2005, the draft of which was considered by the Board at its June 2006 session.

The Director General is also hereby reporting in fulfilment of the request contained in resolution GC(49)/RES/11 on “Strengthening of the Agency’s technical cooperation activities”.

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Summary

The *Technical Cooperation Report for 2005* provides highlights of activities and achievements of the technical cooperation (TC) programme for the past year. The document also describes developments regarding the management of the programme and financial matters.

Engaging and maintaining partners for development remained a priority for the Secretariat. During 2005, cooperation with the United Nations Development Programme/Global Environment Facility continued with a project in Africa regarding the management of the Nubian sandstone aquifer system. The TC programme is also playing a role in programmes funded through the World Bank (Guarani Aquifer Project), Asian Development Bank (Clean Air Initiative for Asian Cities) and African Development Bank (Southern Rift Valley Tsetse Eradication Project in Ethiopia and tsetse projects in other countries).

TC programme activities during 2005 continued to support Member States in developmental areas related to nuclear science and technology. The spectrum of activities included the development of a system for the disposal of sealed radioactive sources; providing expert advice and computer applications for energy planning; training nuclear medicine specialists and radiation oncologists; continuing the core conversion of research reactor fuel from highly enriched uranium to low enriched uranium; and evaluating and monitoring a marine ecosystem for pollution sources and developing remedial actions.

Along with implementing the programme for 2005, Secretariat staff were involved in the final phases of the change initiative. The new structure for the Department of Technical Cooperation took effect as of 9 December 2005. The review of programming processes evolved into the development of the Programme Cycle Management Framework. This approach to TC programming is facilitated by a web-based platform for stakeholders to develop and manage TC projects from concept through project design, approval, implementation and evaluation.

To identify how the changes in the structure of the Department and in the programming process will affect stakeholder satisfaction, the Department conducted surveys to establish a baseline for future assessments. The surveys targeted, inter alia, Member States, including National Liaison Officers, national coordinators, project counterparts and representatives at Missions in Vienna, and show that this grouping is satisfied overall with the programme.

Financial indicators, including the value of the programme to be delivered, new resources, disbursements and new obligations for 2005 were all above 2004 levels. Extrabudgetary resources rose to a new record level of \$14.9 million. Some \$10.2 million of these resources were used to upgrade footnote-a/ projects or project components, providing funding for just under 25% of the approved footnote-a/ budgets.

The Agency's Technical Cooperation Programme at a Glance (as of 31 December 2005)

The target for voluntary contributions to the Technical Cooperation Fund for 2005 was **\$77.5 million**.

New resources for the technical cooperation (TC) programme were **\$91.9 million**.

- Technical Cooperation Fund: **\$75.8 million**
- Extrabudgetary resources: **\$14.9 million**
- In-kind contributions: **\$1.2 million**

The adjusted budget for the TC programme for 2005 was **\$116.0 million**.

Disbursements for the TC programme reached **\$73.6 million**.

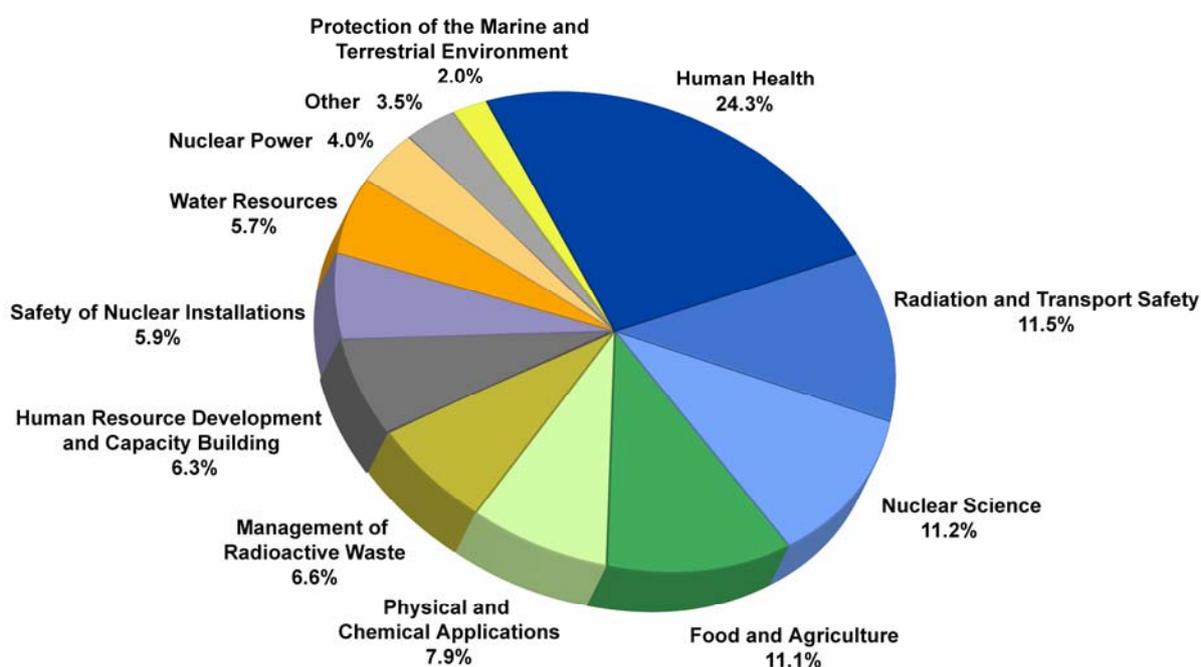
Net new obligations during the year were **\$79.6 million**.

The implementation rate for the programme was **68.6%**.

The number of countries/territories receiving support from the programme was **114**.

Project support involved **2784** expert and lecturer assignments, **3202** meeting and workshop participants, **1574** participants in training courses and **1436** fellows and visiting scientists.

Disbursements by Agency Programme for 2005



Technical Cooperation Report for 2005

Report by the Director General

A. Strengthening the Agency's Technical Cooperation Activities

1. This document responds to the General Conference's request to the Director General to report on the implementation of resolution GC(49)/RES/11. This section, organized by the objectives stated in the Technical Cooperation Strategy (see document GOV/INF/2002/8/Mod.1), provides highlights from 2005 covering programme improvements, partnerships, funding opportunities, and strengthening the capacity of nuclear institutions.

A.1. Gaining Recognition as a Partner in Resolving Development Problems through the Cost-Effective Transfer of Nuclear Technologies

2. The Agency is being increasingly recognized as a partner in development and a contributor to the Millennium Development Goals (MDGs). National institutes have played an important role in fostering partnerships. However, other partnerships are still sought: between nuclear authorities or institutes and the end-users; between institutes in different countries; and between the Agency and other organizations contributing to sustainable development.

A.1.1. Building Partnerships with International and Regional Development Organizations

3. Building on previous efforts to develop a strategic partnership with the United Nations Development Programme/Global Environment Facility (UNDP/GEF) for the benefit of the countries that share the Nubian sandstone aquifer system (Chad, Egypt, Libyan Arab Jamahiriya and Sudan), the Agency completed the formulation of the medium-sized project on 'Formulation of an Action Programme for the Integrated Management of the Shared Nubian Aquifer'. The focus of the medium-sized project will be to enhance the existing regional coordination and management mechanism for the joint management of the Nubian sandstone aquifer in parallel with the Agency's efforts to use isotope hydrology techniques to characterize the aquifer system. In view of the importance and potential role of isotope hydrology in achieving the objectives of the project, the Agency was selected by UNDP/GEF to be the executing agency for the implementation of the project. In June 2005, UNDP/GEF approved the project with approximately \$1 million to help implement it, under the auspices of the Agency. In December 2005, a meeting was held in Cairo, Egypt, with all counterparts from the Nubian sandstone aquifer system countries, to assess the progress achieved to date in identifying urgent needs for Agency input for 2006 in terms of isotope analytical services, training and expert services. The meeting also provided the opportunity to discuss the next steps in the

implementation process concerning the project. At the end of the meeting, national and regional work plans were prepared and agreed to by all parties, including implementation schedules with milestones, required national inputs, as well as expected input from the Agency in support of field activities for 2006.

4. Preliminary consultations were held in New York with UNDP regarding the formulation of two projects for consideration under UNDP/GEF funding on the use of isotope hydrology techniques in water resources management to support (i) the Ethiopian Groundwater Resources Assessment Programme (EGRAP); and (ii) a sub-regional project linked to the Nile Basin Initiative (NBI) involving Ethiopia, Kenya, Sudan, Uganda and the United Republic of Tanzania, aiming at establishing the water balances of the Lake Victoria, the upstream Nile Basin and the Blue Nile Basin.

5. Member States of the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (RCA) in the Asia and the Pacific region, through its regional office in the Republic of Korea, have taken action to establish partnerships with other organizations in the region. The UNDP and the Ministry of Science and Technology of the Republic of Korea have agreed to make a financial contribution of \$300 000 for a joint RCA–UNDP project entitled ‘Environmental Impact Assessment of Emergency Natural Disasters Using Nuclear Analytical Technologies’ to be implemented over a period of three years. Collaboration has also been established with the Clean Air Initiative for Asian Cities (CAI–Asia) funded by the Asian Development Bank (ADB). Representatives of RCA attended a meeting on air quality issues in Asia organized under this initiative and presented information on the activities carried out under RCA projects on air pollution monitoring and control. The group has also worked to establish collaboration with the International Maritime Organization/Partnerships in Environmental Management for the Seas of East Asia (IMO/PEMSEA). Representatives from RCA have been invited to participate in the East Asian Seas Congress to be held in China in December 2006 and present its activities on monitoring marine and coastal pollution using radioisotope techniques.

6. The Agency TC programme has active cancer therapy related projects throughout all four regions amounting to approximately \$12 million per year. To enhance and expand these efforts, the Agency formally established the Programme of Action for Cancer Therapy (PACT), the immediate goals of which are to build partnerships with interested parties working in the area of cancer control and to acquire funds from a range of traditional and non-traditional donors. During 2005, the Agency participated in this collective effort, which included the initiation of steps to formalize the establishment of a “Cancer Control Alliance” with WHO, the International Agency for Research on Cancer, International Union against Cancer, the US National Cancer Institute, the American Cancer Society, Oxford University, and the Open Society Institute, with a view to developing and implementing comprehensive cancer control programmes in Member States.

7. Originally established under the auspice of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Synchrotron-light for Experimental Science and Applications for the Middle East (SESAME) became an independent international organization in 2004, with seven members (Bahrain, Egypt, Israel, Jordan, Pakistan, Territories under the jurisdiction of the Palestinian Authority and Turkey) and three observers (Greece, United Kingdom and USA). SESAME aims at promoting regional cooperation through the use of this synchrotron facility as an international centre for research and advanced technology. While a synchrotron machine of a 2.5 GeV capacity is being built at the Al Balqaa University of Jordan for commissioning in 2009, SESAME needs assistance to train its operators and future users. Having been invited to attend the 7th meeting of the SESAME Council held in Jordan in December 2005, the Secretariat described the parameters of the scope and nature of the support that the Agency is in a position to provide to SESAME, through the TC mechanism, in the future. As an initial step, the Agency offered to provide training for SESAME fellows from Agency Member States through the TC programme in 2006.

8. Under a regional Latin America project on the Guarani aquifer system, a project coordination meeting was held in Vienna, Austria, with the participation of the main stakeholders, such as national counterparts, the Executive Secretary for the Guarani Aquifer Project, and representatives of the Organization of American States (OAS). The OAS is the executing agency of the Guarani Aquifer Project which is co-financed by the World Bank, GEF, participating countries and the Agency. Several new opportunities to establish similar partnerships for other trans-boundary aquifers in Latin America were discussed at the meeting. Opportunities for partnerships, currently under consideration by the World Bank, GEF and the Agency, were identified between the Dominican Republic and Haiti; Ecuador and Peru; and Argentina, Bolivia and Brazil. This was the first formal meeting between OAS and the Agency in order to work together and find synergies at a regional level in Latin America.

A.1.2. Supporting the World Nuclear University

9. The World Nuclear University (WNU) was founded in September 2003 with the support of four leading international nuclear institutions (IAEA, Organisation for Economic Co-operation and Development/Nuclear Energy Agency, World Nuclear Association and World Association of Nuclear Operators). One of the activities of the WNU relevant to the Agency's work is the WNU Summer Institute, which provides a period of intense education to a select group of graduate students and young professionals from throughout the world. The Summer Institute was designed to enable participants to:

- gain cutting-edge knowledge and develop a broad international perspective on the full range of policy, environmental and social issues surrounding the peaceful applications of nuclear technology;
- hear from leading thinkers and educators on topics relevant to nuclear applications;
- experience practical teamwork with peers from many nations; and
- advance the global contribution of nuclear science and technology.

10. The first WNU Summer Institute, held in Idaho, USA, over a six-week period during 2005 hosted 77 fellows from 34 countries (32 from 21 countries were funded by the Technical Cooperation Fund). Its activities consisted of many components, including daily lectures, team building activities, weekly review sessions, case studies, final projects, field trips, and a plan of action based on the WNU Summer Institute experience to be implemented after returning home. The result was the establishment of an international network of future leaders with a global perspective and a commitment to contributing to the peaceful use of nuclear technology. The 2005 WNU fellows themselves prepared and signed a declaration addressed to students and young professionals from around the world to join them in carrying the 'Atoms for Peace' vision into the 21st century. In addition, the fellows designed a WNU alumni website to enable them and future WNU programme participants to communicate with each other for purposes of professional collaboration and networking.

A.1.3. Contributing to the Millennium Development Goals

11. The eight MDGs, agreed upon by 189 countries at the Millennium Summit of the United Nations in September 2000, include halving global poverty and hunger, protecting the environment, improving health and sanitation, tackling discrimination against women and illiteracy and establishing an international trade and finance policy framework that favours development. They provide a useful tool for Member States and the Agency to develop international, regional and country programme frameworks in line with the priorities of the international development community. The MDGs are substantiated by 18 targets reflecting objectives and tangible improvements to be achieved by 2015, as well as performance indicators to monitor progress for each of the targets and provide a basis for indicative country-level needs assessment that helps develop political commitment, mobilize public support and fundraising, and monitor and evaluate progress.

12. The present portfolio of TC projects demonstrates that the Agency is already addressing at least five of the eight MDGs in the areas of environmental sustainability, combating disease, hunger and poverty, maternal health and child health.

A.1.4. Incorporating a Gender Perspective into Technical Cooperation for Development

13. Recognizing its commitment to UN mandates and the MDGs, which explicitly acknowledge that gender can have a major impact on development —helping to promote it in some cases while seriously retarding it in others — the Agency has embarked on an initiative that would bring gender to the core of its human resources management and substantive work. Women constitute 51% of the world's population, and as such, represent an important pool of contributors and beneficiaries for the Agency's mandate.

14. Starting with the Department of Technical Cooperation, the Agency will endeavour to translate the principles and guidance outlined in its policy documents to ensure that both men and women are actively engaged in every aspect of the TC programme — planning, design of projects, implementation, evaluation and monitoring. In March 2006, senior managers from the Department of Technical Cooperation met and deliberated on an interim policy on gender for the Department, which culminated in the adoption of a gender mainstreaming action plan for the medium term.

A.2. Increasing the Level of Funding for Technical Cooperation Activities

15. A continued increase in funding from all sources was seen in 2005. New resources made available to the Technical Cooperation Fund (TCF) increased slightly (from \$75.6 to \$75.8 million), due in large part to the payment of National Participation Costs, which were payable for the first time in 2005¹. A more detailed analysis of TCF trends is provided in Part C of this document and the Supplement.

16. Extrabudgetary resources rose to a new high of \$14.9 million. This is an increase of more than one-third over 2004 levels, which were \$10.9 million. Included in this total is an amount of \$1.8 million from the Nuclear Security Fund for implementation of the nuclear security Plan of Activities included in TC projects.

17. Some 75% of extrabudgetary resources were contributed to fund footnote-a/ activities. The largest source of extrabudgetary funding remains individual Member States' contributions to activities in other countries. A total of \$8.1 million, well over half of extrabudgetary resources, came from donor countries. Government cost-sharing from Member States to support assistance in their own country also showed a substantial increase this year, rising to \$5.4 million. A breakdown of the extrabudgetary resources for the past ten years is shown in Figure 1.

¹ Please see document GOV/INF/2006/8, *Review of the Initial Implementation of National Participation Costs*.

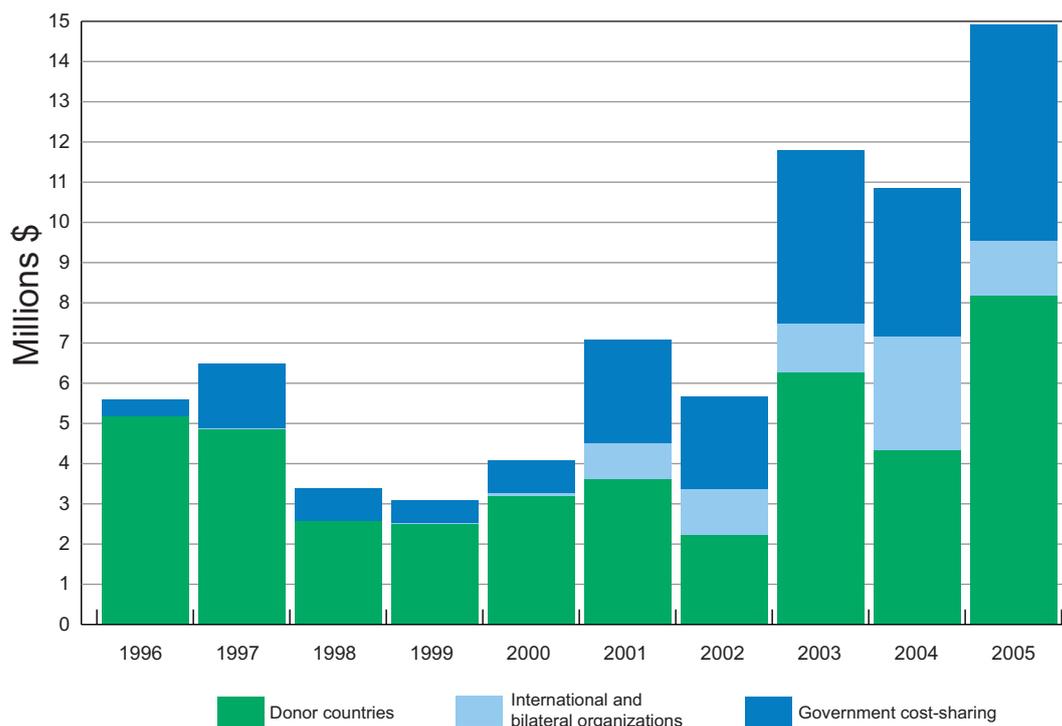


Figure 1. Extrabudgetary resources for 2005.

A.3. Strengthening the Capacity of Institutions Using Nuclear Technology to Become Self-Reliant

18. Promoting self-reliance and sustainability in Member States is one of the key objectives in the TC Strategy. The Asia and the Pacific region has over the last five years cooperated in trying to achieve this objective for national nuclear institutions (NNIs) through a regional project. Initially, efforts were focused on (i) changing the attitude of the scientific staff of NNIs from a focus only on research to a focus in which transferring research and development (R&D) outputs to end users and generating revenue from services and products was also important; and (ii) developing skills in business management so that the generation of new revenues was effective and efficient. In a regional meeting held in Kuala Lumpur, Malaysia, in 2005, participants reviewed progress and lessons learned over the past five years. First, business development units (BDUs), or their equivalent, have been established in almost all the NNIs participating in the project. For example, in Mongolia, a non-government, non-profit organization – MONGOLATOM – has been created and acts as the business development unit for Mongolian nuclear technology by coordinating and facilitating business initiatives between research organizations, government agencies and the private sector. In addition, successful projects, new funding and partnerships with the private sector have been established with assistance from the business planning training provided through the regional project in Member States such as Bangladesh, Indonesia, Mongolia, Philippines, Sri Lanka, Thailand and Vietnam.

19. Efforts to bring sustainability to NNIs were also seen in Africa. Dedicated national workshops were conducted and a regional course was held in Tunisia to train managers of NNIs on the methodology and requirements for developing and finalizing national strategic plans or business plans to support government efforts towards transforming NNIs into sustainable institutions.

20. In Central and Eastern Europe, national science budgets are increasingly constrained, and government R&D institutes are under pressure to reduce their dependence on central government

funds and to find alternative sources of revenue. Nuclear institutes are in the process of adapting and redefining their role so as to remain relevant to their country's development needs.

21. The first training course on business skills for senior scientists and managers of nuclear institutes was organized in Bled, Slovenia, in 2005, with the participation of senior managers from 12 Member States. This course provided training in some of the skills needed to develop and deliver more income-generating products and services, and to bring about change in the management culture in countries in transition from centrally controlled markets to market economies.

22. Also in 2005, a meeting was held between World Bank science and technology project leaders and a representative from the Europe region to coordinate the World Bank's initiative to provide structural and financial support to the science sector in several countries around the world. As a result, for the first time, a nuclear R&D institute will be included in the preparatory phase of a World Bank science and technology project.

A.3.1. Building Human Resources for Nuclear Technology

23. In 2005, the Agency continued fulfilling its commitment to the development of human resources through direct and sustained support to Member States' efforts, with particular emphasis on education in nuclear science and technology. The TC programme provides training and education in many ways, such as 'sandwich' training programmes (alternating overseas-home country); long-term training initiatives (particularly in the health sector); distance-assisted training (DAT) programmes to complement the conventional mechanism of education and training through fellowships, group training and scientific visits; and more recently, information and communication technology (ICT) learning methods, with formats and material that have been developed and gradually introduced to countries.

24. Under an African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) project, Member States organized in Dakar, Senegal, a forum on national strategies for human resource development, skills retention, succession plans, and knowledge management and preservation in nuclear science and technology. The meeting made a series of recommendations and resolutions aimed at enhancing decision-makers' awareness of specific issues pertaining to human resource development in Africa (lack of adequate human resources, insufficient availability of suitable institutions for training, lack of knowledge management schemes and succession plans).

25. Through another AFRA project, the concept and significance of quality management, including quality assurance and quality control (QA/QC), have been further introduced to African countries through specific training programmes provided regionally and nationally as well as advice to national testing laboratories to prepare them for certification and accreditation. Coordination with the United Nations Industrial Development Organization (UNIDO) in this field increased with its participation in the AFRA project coordination meeting and the first conference on quality management, which were hosted by Mauritius and attended by more than 100 managers and scientists from Africa, Asia, North America and Europe. The conclusions and recommendations from the meeting were used to assess progress in the field of establishing quality management systems at national levels and to design and formulate a large-scale project for assistance in quality management in collaboration with regional partners, such as the New Partnership for Africa's Development (NEPAD) and the International Laboratory Accreditation Cooperation (ILAC). Through direct assistance and guidance provided by dedicated consultants assigned to each participating country under this project, several testing laboratories are ready for accreditation.

26. Furthermore, assistance was provided to Kenya for organizing a national seminar on peaceful uses of nuclear sciences and technology for socio-economic development. This led to the finalization

of a draft statute and the establishment of the Society for the Promotion of Peaceful Applications of Nuclear Science and Technology (SPANS-K).

27. Through a Cooperation Agreement for Promotion of Nuclear Science and Technology in Latin America and the Caribbean² (ARCAL) regional project, QA/QC capabilities were improved, thus strengthening links between nuclear institutions and national accreditation bodies. Participating laboratories made progress implementing quality systems and improving the reliability of analytical output. Laboratories in Brazil, Chile and Peru organized national and regional proficiency tests, and eight laboratories (two in each of the following countries: Argentina, Chile, Cuba and Mexico) received national accreditation or re-accreditation according to ISO 17025 standards. The assistance received during this project contributed to increasing quality management in all countries and will eventually result in several additional accredited laboratories in Latin America.

A.3.2. Promoting Technical Cooperation among Developing Countries

28. The TC programme in Africa continued supporting a strong technical cooperation among developing countries (TCDC) component. In various areas, regional cooperation was further promoted through networking to increase impact and to further self-reliance and long-term sustainability on the continent. To support capacity building efforts, region-wide emphasis was placed on the use of AFRA designated regional centres (DRCs), especially to help Member States in promoting peaceful applications of nuclear techniques in the areas of non-destructive testing, mutation breeding and biotechnology, radiation oncology and medical physics, radioactive waste management, radiation processing and maintenance of scientific equipment.

29. Member States in the Europe region use TCDC to complement support provided by the Agency's TC programme. The Hungarian training centre for nuclear power plant personnel at Paks regularly provides support to other countries in the region by hosting training activities and providing cost-free experts to the Agency to implement TC projects. During 2005, the Hungarian training centre began cooperation with the training centre at Zaporozhe nuclear power plant in Ukraine through a TC project.

30. Another example in the Europe region is the long-term cooperation between the Nuclear Research Institute in Řež, Czech Republic, and the Armenian nuclear power plant. This cooperation is focused on the improvement of safety issues at the nuclear power plant in Armenia, including information and technology exchange, and related training of Armenian specialists. Cooperation between these two organizations is mainly financed through extrabudgetary contributions of the Czech Government to national TC projects. During 2005, the Czech Government provided \$90 000 in extrabudgetary funds to project ARM/9/016. A plan for follow-up activities between these organizations was agreed upon and included in the work plan of the project for 2006.

31. TCDC was one of the main characteristics in the recently completed regional project on sustainable management of groundwater resources in Latin America. Chile and Colombia provided technical support to the other participating countries in the implementation of field investigations. The project strengthened the role of the isotope hydrology laboratories in Latin America (Chile and El Salvador for stable isotopes, Brazil for tritium and Uruguay for carbon-14) as a reliable resource for the analytical needs involved in these studies. About 87% of more than 2000 samples taken in the project were analysed in these laboratories, thereby supporting efforts to ensure the sustainability of the capabilities in the laboratories.

² The ARCAL Agreement entered into force on 5 September 2005.

32. In addition, the project trained more than 200 technical staff from the counterpart institutions in the field of isotope hydrology and related conventional techniques. The project has introduced a multidisciplinary approach in the Member States' work on hydrogeology and incorporates nuclear techniques for groundwater studies as a routine activity. In Colombia, a national programme for groundwater exploration with the participation of the Colombian Institute of Geology and Mining (INGEOMINAS), the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) and corporations will enable the systematic collection of information on all important aquifers in the country by 2010.

33. In the Asia and the Pacific region, breeding better varieties of selected crops, which is a tedious and time-consuming process, is a priority for most of the RCA Member States. Availability of genetic material of superior crop varieties developed elsewhere would significantly reduce the time and effort needed for the plant breeding programmes. RCA Member States participating in a regional project on enhancement of genetic diversity in food, pulses and oil crops have exchanged genetic materials of superior varieties of wheat, sorghum, soybean, groundnut and mung bean, many of which have been proven to be better than the existing local varieties in the recipient countries.

B. Programme Accomplishments and Impact during 2005

34. This section highlights some of the activities and accomplishments of the TC programme during 2005, by region and thematic area.

B.1. Africa

35. In 2005, the TC programme provided support to 33 Member States through 237 national projects and 48 regional projects. Disbursements in the region for 2005 by area of activity are provided in Figure 2.

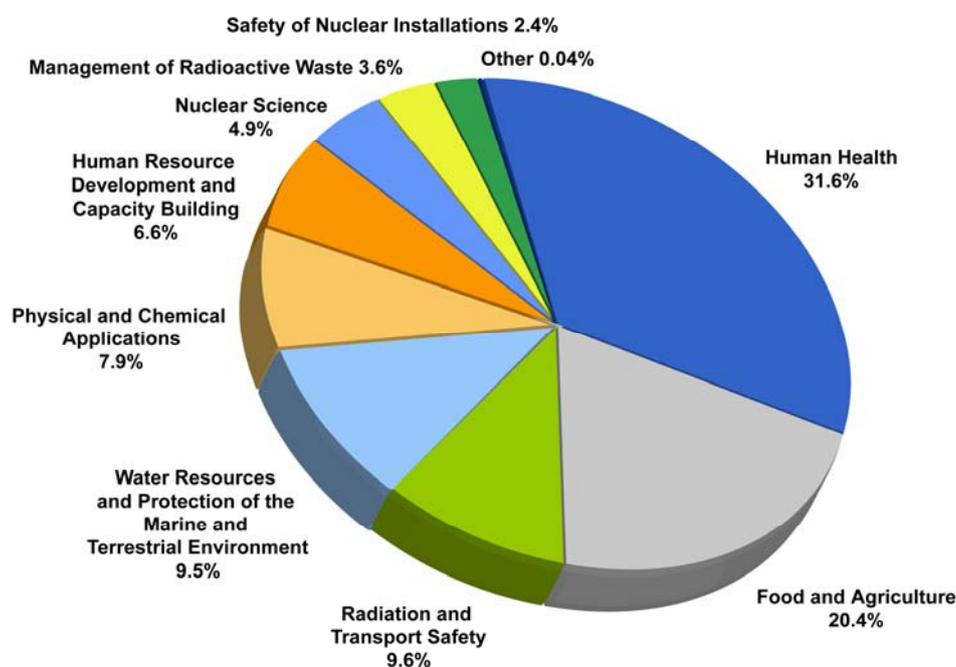


Figure 2. Disbursements by area of activity in the Africa region for 2005.

B.1.1. Supporting the Creation of Tsetse-Free Zones

36. One of the main areas of the TC programme in Africa continued to be the transfer of the sterile insect technique (SIT) in the context of area-wide integrated pest management (IPM) in support of creating tsetse-free zones in selected areas. In Ethiopia, Agency assistance focused on the Southern Rift Valley Tsetse Eradication Project (STEP) which is being supported under a national project. The project has received new impetus with the \$14 million loan that the Government has secured from the African Development Bank (ADB). With this new development, a work plan and budget covering the next five years have been developed. The ADB strategic partnership and financial support will facilitate STEP to move into large-scale field operations. A cost-free expert is being provided to the project with respect to management issues. The first two modules of the Kaliti Tsetse Rearing and Irradiation Centre, the mass-rearing facility being constructed by the Government of Ethiopia, are largely completed and are expected to be commissioned in April 2006. This will provide the necessary

flexibility to initiate the mass rearing of two species of tsetse. The establishment of large colonies at Kaliti is a prerequisite for initiating field operations involving SIT.

37. Due to the geographical configuration of the tsetse-infested region in KwaZulu-Natal, the creation of tsetse-free zones carries a high potential for success over an area more than 3 times that of Zanzibar. The successful implementation of this long-term undertaking necessitates the eventual participation in the project of the neighbouring country Mozambique, which is not a Member State. All preparatory activities under the South African project have now been completed, including a multi-disciplinary feasibility study (technical, financial and economic, social and environmental).

B.1.2. Improving Crop Productivity

38. Under an AFRA project dealing with mutation breeding and biotechnology, a total of 17 countries are working on crops that have not been subject to previous scientific research work to improve them as well as the development of drought-tolerant varieties. Since the project started in 2001, a total of six new varieties have been released officially in Egypt (sesame), Ghana (cassava), Kenya (wheat), Sudan (banana), and Zambia (finger millet and cotton). In addition, several countries, such as Egypt (safflower, lupin and wheat) and Tunisia (barley and lucerne), have promising mutant materials at advanced stages of development. Other achievements of the project, which were presented at the final coordination meeting that took place in October 2005, is the presence of fully established tissue culture laboratories in almost all of the participating countries as well as molecular laboratories in three participating countries. In addition, new initiatives have been started in selected countries such as United Republic of Tanzania, where the counterpart institute is working closely with a beer company for the development of a new variety of barley.

39. The regional project RAF/5/048, 'Combating Desertification in the Sahel', which involves Burkina Faso, Kenya, Mali, Niger, Senegal and the United Republic of Tanzania, shows that integrated soil-water-nutrient management practices can be employed to significantly improve soil organic matter content of cropping systems, the nutrient use efficiency of crops and the retention of a larger proportion of precipitation or irrigation water in the plant rooting zone. Through this regional project, isotopic techniques demonstrated the benefits of integrated soil-water-nutrient management on soil organic matter, plant nutrition and soil moisture retention.

B.1.3. Providing Support to Human Health Issues

40. Through project RAF/6/029, 'Initiatives in HIV-1 Molecular Epidemiology and Immunology in Support of the UNAIDS-WHO African AIDS Vaccine Programme', five countries (Cameroon, Ethiopia, Kenya, South Africa and Uganda), which have initiated vaccine studies, are collaborating in a study to incorporate nuclear techniques to identify the genetic diversity of the virus for the purposes of vaccine development, to assess immune responses in infected individuals and to monitor the emergence of drug resistance. During 2005, three of the countries obtained ethical clearance³ from their national authorities to commence work. Under a memorandum of understanding concluded with the WHO Regional Office for Africa (AFRO), the project is providing support to the African AIDS Vaccine Programme (AAVP), a network of scientists funded by the WHO. A jointly-funded regional training event was also held during 2005 under this project.

41. Cameroon, Democratic Republic of the Congo, Madagascar, Mali, Mauritius and Niger are among the countries that benefited from continuing Agency support in 2005 to strengthen national capacities in nuclear medicine. Under AFRA, regional expertise was used to conduct a regional

³ Any work that involves human subjects needs to gain ethical clearance from the institute's review board. In this instance, it is for blood analysis.

auditing programme of nuclear medicine services. Awareness amongst key players in this field increased in applications aimed at diagnosing coronary artery diseases, congenital paediatric conditions of the urinary tract, infections, non-functioning endocrine systems and, to some extent, cancer management.

42. Under a regional project to assess nutrition intervention programmes related to HIV/AIDS in Africa, 10 countries have been supported to finalize study designs to assess their national programmes during 2005. Six of these countries have received ethical clearance from their national authorities, and preparations are being made for field work. In most cases, community-based caregivers are being recruited and trained to assist with the feeding and sampling activities.

43. Several Member States continue to receive support to establish and expand radiotherapy facilities for cancer treatment. Eritrea and Niger have been assisted in developing a comprehensive plan to establish the first radiotherapy facilities. For Ghana, support was provided to plan for the expansion of radiotherapy and nuclear medicine facilities at two existing centres and the establishment of a third service in the northern part of the country. The governments concerned are using the radiotherapy facility planning documents in their efforts to secure the necessary funding from potential donors and development partners.

44. In Ethiopia, Ghana, Nigeria, Uganda and the United Republic of Tanzania, a long-term strategy in training key medical personnel was initiated in an effort to address the shortage of human resources commonly experienced throughout the region. Thanks to assistance provided to the United Republic of Tanzania, radiotherapy and nuclear medicine services have improved at the Ocean Road Cancer Institute, the only medical centre of its kind in the country. The Government pursues a plan to expand the availability of these services to Northern Tanzania. In Nigeria and United Republic of Tanzania, progress was reported in establishing a national pilot programme for education and training of radiotherapy technicians, therapy radiographers and registrars.

45. The two complementary projects RAF/6/024, 'Management of the Most Common Cancers in Africa (AFRA II-4)', and RAF/6/027, 'Strengthening Regional Capability in Medical Physics (AFRA II-5)', continued efforts to tackle weaknesses in the field of training and education in both radiotherapy and medical physics. To achieve this goal, the projects developed harmonized curricula with the aim to facilitate training on the continent, enhance the recognition of the profession of medical physics and to enable the two AFRA-designated centres to lead this effort in the field of radiation oncology. The developed curricula have been well received by the six participating countries that have education programmes in the field. A third candidate institution is being audited and it is expected that its recognition will be secured in September 2006.

46. In 2005, much emphasis was placed on strengthening Member States response to increasing cancer incidence, particularly the HIV-related cancers, through the provision of training for key personnel involved in cancer management, the provision of specific equipment for both clinical and safety aspects, and financial and administrative support for the organization of the Third African Radiation Oncology Group (AFROG) Congress, which was held in South Africa in November 2005. The Congress attracted more than 100 radiation oncologists, radiographers and medical physicists from Africa, Asia, Europe, and North America, and allowed the African radiation oncologists and medical physicists to debate issues of vital importance to their profession and to the region's strategy and plans to combat cancers holistically.

B.1.4. Increasing Non-Destructive Testing Capabilities

47. The increased application of non-destructive testing (NDT) techniques throughout Africa in industrial quality control calls for standardization of training, qualification and certification of NDT personnel. Under a regional AFRA project, Agency support was provided to strengthen national

capabilities for teaching and training in NDT methods and techniques and to establish competent authorities for certification and accreditation. African Member States have opted for a regional approach to maximize scarce resources and avoid the proliferation of facilities with low national demand. Currently, the majority of countries rely on training and certification of NDT personnel at two DRCs recognized by all Member States of AFRA.

48. Until recently, none of the African Member States had acquired the necessary capability for certifying NDT personnel at Level III, which represents the expertise that is needed to establish a sustainable NDT capacity for training and promoting NDT techniques at the national level. Since 2003, several regional training courses leading to certification at Level III were supported. NDT practitioners from 14 Member States have benefited from this initiative. In all, 79 new Level III certifications have been achieved over the last three years.

49. As in other African countries, NDT activities are growing in the United Republic of Tanzania with an increasing number of practitioners and an increased demand of NDT services in transporting petroleum products, assessing power plants, etc. The Agency continued its assistance to the Tanzania Industrial Research and Development Organization (TIRDO) to establish a quality certification scheme in the country. Efforts focused on achieving TIRDO's accreditation. As a result, TIRDO now has the capability to compete with foreign companies on NDT services, thus increasing the country's self-reliance in the inspection of engineering components.

B.1.5. Supporting Sustainable Energy Development

50. Under regional project RAF/0/016, 'Sustainable Energy Development in Sub-Saharan Africa', national counterparts in the Democratic Republic of Congo, Ethiopia, Mauritius, Niger, Nigeria, Sudan and United Republic of Tanzania produced reports on energy demand (using the Model for Analysis of Energy Demand [MAED]) and energy supply option (using the Wien Automatic System Planning Package [WASP]) – the first step in preparing an energy policy document. In November 2005, 18 participants from these Member States were trained in Arusha, United Republic of Tanzania, on the Agency's Model of Energy Supply Systems and General Environmental Impacts (MESSAGE). Participants were trained on how to use the application to develop future energy development scenarios in a consistent manner, i.e., how the future energy sector should develop to meet increasing energy/electricity demand, fostering economic growth and electrification/industrialization of the country while protecting the environment, and optimally utilize available resources and technological options aiming at long-term sustainability.

B.1.6. Assisting the Development of a Legislative Framework

51. In December 2005, the Agency organized the African Regional Meeting for Senior Government Officials on the International Legal Framework Governing Nuclear Safety, Security and Safeguards in Vienna, Austria, which was attended by 49 participants from 30 African Member States. The meeting provided the participants with an overview of nuclear law and legislation; in-depth information on existing international instruments concerning nuclear safety, security and safeguards; and a briefing on recent developments in these areas, such as amendments to the Convention on Physical Protection of Nuclear Material, the Code of Conduct on the Safety and Security of Radioactive Sources, the Code of Conduct on the Safety of Research Reactors, and UN Security Council resolution 1540 on the non-proliferation of weapons of mass destruction. The meeting increased the awareness at the policy-making level of the importance of the relationship between nuclear safety, security and safeguards and of establishing a comprehensive and effective nuclear legislative system in African countries.

B.1.7. Improving the Safety of Nuclear Installations

52. The most significant activity under the TC programme in Africa in the area of safety of nuclear installations relates to the safety of research reactors. Issues that are addressed under the TC programme are, among others, the need to upgrade and strengthen regulatory control, maintenance of equipment and loss of expertise.

53. In Libyan Arab Jamahiriya, assistance was provided to enhance safety at the Tajoura nuclear research reactor. Further support, mainly through expert services and training, is being provided to assist in upgrading safety-related systems, the completion of the safety analysis report (SAR) and in setting up a quality assurance programme for the Tajoura nuclear research reactor. Assistance has also been provided to assess the quality of the LEU fuel used in the conversion of the research reactor and critical facility, and to implement in-pool inspection capabilities.

54. In Morocco, assistance provided for the commissioning of the TRIGA Mark II research reactor included a pre-Integrated Safety Assessment of Research Reactor (INSARR) mission to review technical information necessary to expedite a preparation of the safety analysis report at this phase.

55. Following the INSARR mission undertaken in 2004 in Democratic Republic of the Congo, the Agency continued its assistance to the research reactor, CREN-K. Focus has been on strengthening regulatory control and the quality assurance programme. Initial steps have been taken to assist in a preliminary design of a decommissioning plan.

B.1.8. Providing Radiation and Transport Safety Assistance

56. The promotion and development of nuclear techniques for socio-economic development requires an adequate radiation safety infrastructure to protect those who work with ionizing radiation, the public at large and the environment from the hazards associated with the uncontrolled use of radiation. Significant efforts have been deployed under the TC programme to improve the radiation protection infrastructure in all African Member States. Special emphasis has been placed on the establishment of legislative and regulatory frameworks for enforcement of radiation safety standards and targeted assistance for the safe conditioning and disposal of radioactive sources.

57. Through five regional projects, significant assistance was provided to Member States in building capacity for sustainable radiation and waste safety infrastructures. Eight regional and national training events addressed the countries' needs in such priority areas as regulatory control, radiological protection of patients and radiation protection in industrial radiography. The fourth postgraduate educational course (in French) on radiation protection and safety of radiation sources was held in Rabat, Morocco, during 2005. A regional inter-comparison exercise involving 14 countries continued to promote quality management and dose assessment in the provision of individual monitoring services.

58. When sealed radioactive sources come to the end of their useful life, they are still radioactive enough to be hazardous to people and the environment and therefore should be carefully managed. To help with this issue, the Agency assisted the AFRA Member States to develop in collaboration with the South African Nuclear Energy Corporation (Necsa) the Borehole Disposal of Disused Sealed Sources (BOSS) system. This system is designed to provide safe, secure, permanent and economically feasible disposal of disused sealed radioactive sources. The system has been subjected to rigorous investigation and review. International experts have pronounced it safe and consistent with best practices.



Scientists at the Cocoa Research Institute of Ghana are using mutation breeding techniques to develop plant strains that are resistant to the Cocoa Swollen Shoot Virus, which has destroyed millions of Ghana's cocoa trees in recent decades. To learn more, go to www.iaea.org and view the photo essay Cocoa Trees Fight Back.

B.2. Asia and the Pacific

59. In 2005, the TC programme provided support to 24 Member States through 188 national projects and 65 regional projects. Disbursements in the region for 2005 by area of activity are provided in Figure 3.

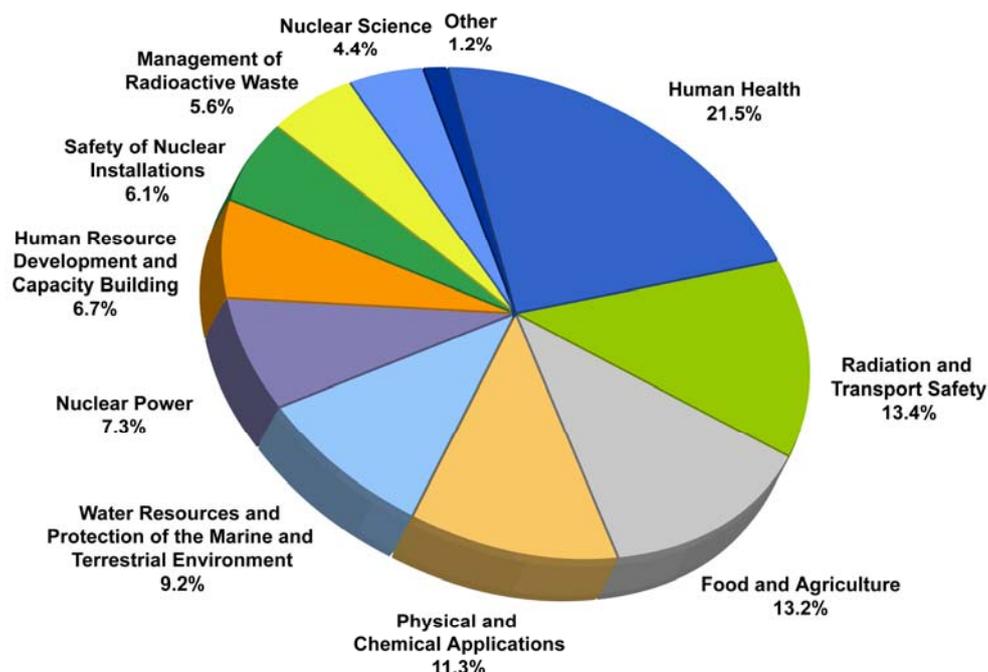


Figure 3. Disbursements by area of activity in the Asia and the Pacific region for 2005.

B.2.1. Supporting Energy Planning and Nuclear Power Development

60. To meet the long-term energy demands in the Asia and the Pacific region, the Agency has transferred necessary Agency computer software packages and helped to develop expertise in Member States to assist in the evaluation of energy options including nuclear power for achieving sustainable energy development. Under an RCA project, Pakistan completed its evaluation, and the Government has adopted a long-term nuclear power development plan that envisages an increase in nuclear electricity generation from the present 425 MW(e) to 8800 MW(e) by the year 2030. In Mongolia, the study on energy demand through 2025 was completed, and recommendations on the long-term energy mix through 2025 will be submitted to the Government soon.

61. Regional project RAS/4/021, 'Management of Changes for Competitive Nuclear Power Performance', aims at transferring to Member States of the region the international best practices in managing nuclear power plant operations and construction. Regional workshops and training courses were organized in 2005 to transfer newly developed techniques, such as probabilistic safety assessments (PSAs) for risk informed maintenance and in-service inspection, advance instrumentation and control systems, and outage management.

62. The United Arab Emirates is facing an increasing demand for energy and desalinated water for consumption. A first mission by a team of experts undertaken through a TC project aimed at establishing a core team of the national authorities required for collecting the information needed to assess feasibility of using dual purpose reactor technology for energy and water supply. Through the

use of the Desalination Economic Evaluation Program (DEEP) and further training of the core team, it is expected that, in 2006, the national authorities will be in a position to assess the technical and economic feasibility of a nuclear power and water desalination plant.

63. During 2005, the Agency's TC programme, with significant government cost-sharing, continued to contribute to the design safety review, quality assurance, safety culture, personnel training and qualification system, emergency preparedness, physical protection and plant security of the first nuclear power plant in the Islamic Republic of Iran at Bushehr site (BNPP-1). Moreover, Agency assistance was also directed to other national stakeholders such as the regulatory authority, in order to assist the authority in the implementation of its functions during the design, construction and preparation for commissioning stages of the BNPP-1 project.

B.2.2. Enhancing the Safety of Nuclear Installations

64. Regional project RAS/9/025, 'Strengthening Management of Operational Safety at NPPs', has provided a forum for the Member States of the region with nuclear power plants in operation or under construction to exchange information and experiences to further strengthen and improve the existing safety management system. Regional workshops on new Agency safety regulations on safety management, performance based safety management and knowledge management were held in 2005 to address some new challenges that Member States of the region are facing.

65. Enhancing nuclear safety through sharing safety knowledge has been the focus of regional project RAS/9/028. In 2005, the project continued its contribution to the Asian Nuclear Safety Network (ANSN) by assisting Member States to establish their own national centres that would effectively share and communicate nuclear safety related knowledge.

66. The Agency's design safety review missions were carried out together with Pakistan Nuclear Regulatory Authority (PNRA), Pakistan Atomic Energy Commission, and the main contractor and plant designer from China to review all chapters of the preliminary safety analysis report (PSAR) for the new nuclear power plant, Chasma-2. Those design safety review missions have assisted PNRA in its licensing process. As a result, the construction permit was issued in December 2005 and the construction has begun.

67. In addition in 2005, the Agency assisted China in finalizing the utility requirements and guidelines on fire safety for nuclear power plants.

B.2.3. Advancing the Quality and Effectiveness of Radiation Protection

68. Assistance in radiation protection was continued in 2005 largely through new thematic oriented regional projects and one for education and training. Most countries in the region participating in the radiation protection programme have advanced towards establishing and sustaining the necessary regulatory framework and are enhancing the effectiveness of the system of notification, authorization, inspection and enforcement. Two countries that recently joined the regional projects received assistance towards establishing a regulatory framework. Lebanon has issued a governmental decree to advance its regulatory framework, and Mongolia has now taken steps to elevate the status of its independent regulatory authority. In Thailand, the Cabinet approved a decree effectively separating the regulatory functions of the Office of Atoms for Peace from its promotional activities by establishing the Thailand Institute of Nuclear Technology (TINT).

69. Efforts by the Agency focused on establishing QA/QC programmes in the participating Member States, in particular on occupational exposure control and on medical exposure control. The introduction of the quality management system for occupational exposure control was planned and carried out through a regional training event. The QA/QC programmes in medical practices, especially

in diagnostic radiology to reduce patient exposure, have established national pilot projects in each participating country. Group meetings were conducted to bring further awareness for the need of patient dose measurements and audit, and to sensitize cardiologists and radiologists on the issue of patient protection.

70. Human resource development is an important part of the effort to strengthen Member States radiation and waste safety infrastructure. In 2005, this was partly achieved through two one-year university-based postgraduate educational courses on radiation protection and safety of radiation sources, one held in Malaysia in English (for the fourth time) and one held in the Syrian Arab Republic in Arabic (for the fifth time); eight specialized regional training events and several national training events were held; and more than 100 individual fellowships and scientific visits were placed.

B.2.4. Improving the Quality of Health Services

71. Promoting regional activities is a way to transfer the know-how and increase awareness for many issues, including cancer-related issues. Project RAS/6/044, 'A Comprehensive Approach for Detection and Management of Cancer using RIA Technology', has successfully led to the establishment of an integrated approach for the detection and management of prostate and breast cancers in some of the participating Member States, as well as in addressing the needs and problems of the region concerning the production and clinical use of existing and new tumour markers.

72. In Yemen, Agency support since 1997 led to the opening of the first National Oncology Centre in March 2005 as part of Al Ghombouri Hospital in Sana'a. The Centre is now treating an average of 90 to 100 patients a day with a cobalt-60 teletherapy unit. In Jordan, Al Bashir Hospital in Amman, one of the main public hospitals in the country, acquired Single Photon Emission Computed Tomography (SPECT) capabilities for an increased accuracy and diversification of the clinical investigations of patients. In Myanmar, a radiotherapy simulator provided by the Agency was successfully commissioned in September 2005 at the Mandalay General Hospital. This has enhanced the capacity of the hospital to improve cancer services and treatment of its patients.

73. The lack of teaching resources in the applied sciences of radiation oncology is affecting the quality of radiotherapy services in many RCA Member States. A distance-learning project on the use of applied sciences for radiation oncology was conceived by RCA Member States to address this issue. A contract was awarded to South West Sydney Area Health Service, Australia, to prepare the distance learning material. These materials have been pilot tested in three RCA Member States, two AFRA Member States and two ARCAL Member States. The distance learning material received high ratings on the ease of use, the relevance of the course content, and the depth of knowledge from the students who participated in the pilot programme. The distance learning material will be revised based on the feedback received during the pilot testing and finalized in 2006.

74. In nuclear medicine, formal training for technologists is also not widely available in the Asia and the Pacific region, which was identified as one of the main hindrances in improving the quality of nuclear medicine services. Development of distance learning material was seen as a solution to this problem and an RCA project, partially financed by Australia, was initiated. Australia also provided technical support for this project. The distance learning material developed under this project was pilot-tested in 12 countries with the participation of about 300 students. The course material is based on a comprehensive syllabus with 25 subjects delivered in 12 modules at basic and advanced levels. This programme will train practising nuclear medicine technologists, under the supervision of senior nuclear medicine specialists, at designated nuclear medicine centres with the necessary equipment. The material and guidelines for their use were finalized in 2005, and are being distributed to Member States who have established the infrastructure necessary for a sustainable training programme. The final version of the DAT has been released to the RCA countries.

75. Availability of radioisotopes is critical for nuclear medicine practices. Bangladesh has 14 nuclear medicine centres and was assisted to upgrade the technetium-99m production facilities at the National Nuclear Centre. Since October 2005, the plant has been producing radioisotopes sufficient to fulfil the demand of the country and is expected to help Bangladesh to save at least \$150 000 per year by reducing imports of technetium-99m. Similarly, Malaysia was assisted with project planning, facility design, operation of cyclotron and positron emission tomography (PET) facilities, production of radioisotopes, and clinical applications of PET. Using government funds, the first PET/computed tomography equipment has become operational at Penang Hospital.

76. Congenital hypothyroidism and other preventable metabolic conditions have prompted many countries to institute a formalized screening programme directed at newborns. The timely treatment of congenital hypothyroidism can save lifelong human suffering caused by severe mental retardation. With the involvement of the Agency, such screening programmes have been introduced successfully in a large number of countries in the Asia and the Pacific region with significant impact on child health. In 2005, a new *Guidance Book for Developing Programmes Screening of Newborns for Congenital Hypothyroidism* was prepared, drawing on more than a decade of Agency experience in this area.

B.2.5. Reducing Malnutrition

77. Micronutrient deficiencies (e.g. iron and vitamin A) are major health problems in the Asia and the Pacific region. Many countries, such as China, Indonesia, Pakistan, Thailand and Vietnam, have initiated food fortification intervention programmes as a solution. Isotopic techniques are applied to evaluate and monitor the effectiveness of the programmes, especially to assess and verify bioavailability of the key micronutrients. The TC project in this area has achieved some preliminary results with confirmation that fortified soy sauce and fish sauce used in China, Thailand and Vietnam are efficacious at improving iron status in the target populations. The studies in Indonesia on vitamin A fortified cooking oil have demonstrated good absorption and possible increases in vitamin A stores in the liver with prolonged intake of the oil. Other efforts are focused on the bioavailability of fortified food through the breeding of low phytic acid rice varieties, which could provide for better absorption of micronutrients. The project is expected to provide input for policy development for effective food fortification intervention. The project also helped to enhance collaboration among the participating countries for effective networking and exchange of information and knowledge.

B.2.6. Managing Groundwater and Environmental Pollution

78. Groundwater resources for many countries in the region are affected by both manmade and natural sources of pollution. RCA Member States have acquired the know-how of applying isotope techniques to quantify the levels of pollution and to identify the source of pollution in order to take remedial measures. Arsenic poisoning has affected the groundwater resources of many countries in the region and both national and regional TC projects have helped these countries to address this issue. Studies carried out in Bangladesh have contributed to the establishment of an early warning system for sustainable groundwater protection. China has carried out a detailed hydrogeological survey in the Datong Basin where groundwater with high arsenic content has been found. India has interpreted stable isotope data to identify the processes affecting the arsenic contaminated groundwater.

79. Landfills and other sources of pollution are also affecting the groundwater resources, especially in the urban areas. Indonesia has applied single and double borehole techniques in Bantar Gebang landfill to determine groundwater flow direction and flow characteristics. Studies carried out in Malaysia to assess the impact of Pulau Burung Sanitary Landfill on groundwater resources have indicated that groundwater pollution is not caused by the leachate seepage from the treatment ponds.

Water samples from Rawalpindi/Islamabad and Multan areas in Pakistan have been analysed for isotopes, chemicals, faecal matter and coliform.

80. In Yogyakarta, Indonesia, water pollution on the Code River caused by industrial development has been a concern. The local government developed a monitoring system for compilation of data and information necessary for proper planning and intervention. The National Nuclear Energy Agency (BATAN) has been requested to participate in applying nuclear technology for data analysis. Technical assistance is provided under a national project to advise on how to conduct the analysis activities. The studies are in progress with close collaboration among the responsible authorities. The project is expected to result in development of a water monitoring system, which will be used and sustained by the Government.

81. In 2005, with Agency assistance, installation of a of high power accelerator (1MeV 400kW) and wastewater treatment system in the Daegu Dyeing Industrial Complex (DDIC) was completed and operation started. This plant treats up to 10 000 cubic metres of textile dyeing wastewater and shows good results for the removal of non-degradable organic impurities. The DDIC is planning to install several more plants to treat their total wastewater with electron beam.

B.2.7. Increasing Agricultural Productivity

82. For several years, programmes to control the Mediterranean fruit fly using the sterile insect technique (SIT) have been supported in Israel, Jordan and in the Territories under the jurisdiction of the Palestinian Authority through TC projects with the financial support of the United States Agency for International Development-Middle East Regional Cooperation (USAID-MERC) Program. Until 2005, the programmes in Israel and Jordan were entirely relying on import of sterile male medfly pupae from Guatemala, therefore limiting the expansion of the commercial fruit producing areas under control. In March 2005, a medfly production facility was opened in Israel. By the end of 2005, it reached a weekly capacity of 18 million sterile males, capable of covering the needs of the Israeli and the Jordanian programmes. As from January 2006, the facility will provide sterile flies to the Territories under the jurisdiction of the Palestinian Authority, therefore allowing for the first time the use of the SIT in this area. The three medfly control programmes, closely linked in operational aspects, have become self-reliant for their needs in sterile insects, allowing for a long-term and sustainable use of the SIT.



A medical physicist uses a cobalt radiation treatment machine in the Kandy General Hospital, Sri Lanka.

B.3. Europe

83. In 2005, the TC programme provided support to 31 Member States through 176 national projects and 37 regional projects. Disbursements in the region for 2005 by area of activity are provided in Figure 4.

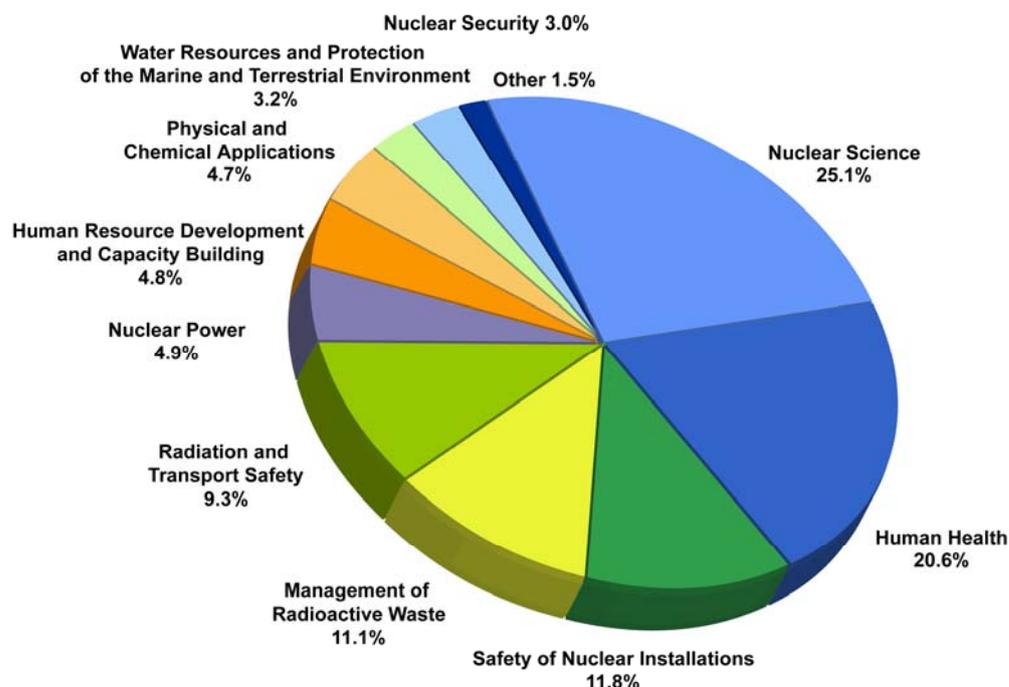


Figure 4. Disbursements by area of activity in the Europe region for 2005.

B.3.1. Sharing Reliable Marine and Terrestrial Environment Information

84. In 2005, a portion of the TC programme in the Europe region was related to nuclear applications in environmental monitoring and marine, terrestrial and air environmental protection. Agency assistance was provided through national projects focused on specific national issues and also through regional projects primarily aimed at sub-regional networking.

85. In the area of marine environment, based on the request of Mediterranean countries, the Agency launched a new regional project, RER/7/003, 'Marine Environmental Assessment of the Mediterranean Sea'. Albania, Bosnia and Herzegovina, Croatia, Cyprus, Greece, Malta, Serbia and Montenegro, Slovenia and Turkey joined efforts for regional cooperation through coordinating assessments of marine radioactivity and tracer applications to study the pollution of the East Mediterranean area. It is expected that joint activities in the region orchestrated with other international entities (e.g. United Nations Environment Programme/Programme for the Assessment and Control of Pollution in the Mediterranean Region, Barcelona Declaration) will benefit the environment, fisheries and tourism in the participating Member States.

86. As for the terrestrial environment, the Agency has initiated several national projects in support of strengthening national capabilities in measurement and assessment of radionuclides and non-radioactive pollutants. A good example is a pilot study of the aquatic environment of Azerbaijan. The summary report, *Radiological Survey of the Araks and Kura Rivers*, issued by the Agency, includes information about radionuclides, heavy metals and pesticide pollution.

87. In order to contribute to air quality improvement, a regional project was started to establish a sub-regional air monitoring network and to design remedial strategies. The radionuclide and heavy metal concentration in air is a critical factor in assessing the environmental quality and the impact of possible pollutants. Currently, most of the countries in the region lack reliable data on air monitoring and there is no established mechanism for data comparison and sharing. The first year of the project included a coordination meeting that produced the baseline data and a training course to discuss and agree on standard protocols for heavy metal monitoring.

88. The Agency also continued to provide assistance to countries most affected by the Chernobyl accident. The Agency's contributions have been recognized by the governments of the affected countries and also by the United Nations. The UN General Assembly at its 60th session, through resolution A/RES/60/14, *Strengthening of international cooperation and coordination of efforts to study, mitigate and minimize the consequences of the Chernobyl disaster*, noted “with satisfaction assistance rendered by the International Atomic Energy Agency to Belarus, the Russian Federation and Ukraine on remediation of agricultural and urban environments, cost-effective agricultural countermeasures and the monitoring of human exposure in areas affected by the Chernobyl disaster”.

B.3.2. Providing Comprehensive and Integrated Actions to Fight Cancer

89. Upgrading the skills of medical practitioners in the fields of nuclear medicine and radiotherapy has always been a priority for European Member States through the TC programme, and 2005 was no exception. Through two TC regional projects, more than 160 nuclear medical physicians, radiation oncologists, medical physicists, and radiotherapy technicians received training in their respective fields.

90. With the focus on providing training in nuclear medicine, an agreement has been taken with the European Association of Nuclear Medicine to take advantage of its educational facilities and training events in Vienna, Austria, to support participation of trainees (physicians and technologists) from Eastern Europe, under project RER/6/011, ‘Thematic Programme on Nuclear Medicine’.

91. The year 2005 also provided an opportunity to improve Agency activities in the field of cancer control. In order to review the activities of the past TC cycles and plan future collaboration in this field between European counterparts and the Agency, a cancer management meeting was organized for the first time in Vienna, Austria, in which ministers (or deputy ministers) of health and leading medical professionals from 27 European Member States participated. Representatives from WHO and the European Society for Therapeutic Radiology and Oncology (ESTRO) were also present. Participants recognized the role of the Agency in the framework of cancer control programmes, in particular the contribution of nuclear technologies to diagnose, treat and palliate, and recommended future activities to further strengthen knowledge in cancer control in order to improve the lives of persons diagnosed with cancer.

92. During the meeting, the Agency’s new Quality Assurance Team for Radiation Oncology (QUATRO) audit methodology was introduced to Member States. The Agency has received numerous requests from developing Member States to perform comprehensive audits of radiotherapy programmes of institutions to assess the entire process, including institute organization, infrastructure needs, and clinical and medical physics components. In response to these requests, The Agency’s Division for Human Health convened an expert group to develop the current guidelines for Agency audit teams.

93. Based on a request from a Member State, a QUATRO audit team evaluates the overall practice of radiation oncology in a comprehensive assessment of the radiotherapy programme of an institution and provides recommendations to improve the quality of radiotherapy practices. Any areas for

improvement would be identified with a view to designating the institution as a centre of competence complying with Agency criteria, such as the following:

- a centre capable of delivering a sustainable radiotherapy service to international standards
- a centre that can serve as a model for other radiotherapy centres in the country
- a centre that provides for professional training in radiotherapy

94. QUATRO missions, which focus on individual institutions, establishing gaps and recommending technologies, are complementary to the Agency's impact missions, which focus on cancer control programmes at the national level. In 2005, the first QUATRO missions in Europe region took place in the Czech Republic, Hungary, Latvia, and The Former Yugoslav Republic of Macedonia.

95. Also during the meeting in Vienna, the Agency's new comprehensive clinical training courses for radiation oncologists were introduced to Member States. The main aim was to shape content and performance of regional training courses to the demands and needs of Member States, taking into account existing subregional differences in educational programmes, patterns of practice and existing equipment.

B.3.3. Continuing the High Enriched Uranium Fuel Return and Core Conversion of Research Reactors

96. Based on Member States' requests and within the context of approved projects, the Agency continues to support activities related to the management of fresh and spent highly enriched uranium (HEU) fuel.

97. In May 2005, the Agency supported Latvian authorities in removing fresh HEU material from a shutdown research reactor in Salaspils, close to Riga. About three kilograms of fresh fuel was safely airlifted back to the Russian Federation. Similarly, in October 2005, fresh HEU was safely returned to the Russian Federation from the Czech Republic. Over the past two years, the Agency has supported similar operations in other countries including Bulgaria, Romania, Serbia and Montenegro and Uzbekistan.

98. The progress achieved in 2005 by the Vinca Nuclear Decommissioning (VIND) programme in Belgrade, Serbia, which includes ultimate disposal of spent HEU fuel from the reactor site in the Russian Federation, started with the facility's radiological characterization in the reactor building. The TC project is co-funded with a \$5 million grant from the US-based organization Nuclear Threat Initiative (NTI) and more than \$1 million has been provided by the TCF. Additional funding from interested donors is in the process of being identified.

99. Finally, in December 2005, the US Department of energy (DOE) provided additional financial support for the transport and storage packaging system (cask) to be used from 2007 onwards for all repatriation associated with the Russian Reactor Fuel Return (RRRFR) programme. A supply contract was signed between the Agency, Škoda and the Nuclear Research Institute Řež for 10 spent fuel transportation casks to be fabricated in the Czech Republic in 2006.

B.3.4. Supporting Sub-Regional Needs

100. In 2005, four Central Asian Member States, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, became part of the Division for Europe. This move marked a positive development for the four Member States providing them with more opportunities for expert involvement, workshops and training. This met the expectations of the countries and also raised the efficiency of delivering the Agency's technical support.

101. The remediation of tailing sites from previous uranium mining and milling activities is an important task in these Central Asian Member States. The accumulated radioactive slurry from these activities poses risks to the environment and public. A new regional project, RER/9/086, 'Safe Management of Residues from Former Mining and Milling Activities in Central Asia', was started in 2005, to provide support to the four countries in addressing the issue. One of the expected outcomes of the project is to build up monitoring and surveillance capabilities in order to collect and analyse data and prepare proposals for proper remediation measures.

B.3.5. Nuclear Safety, Energy Planning and Plant Life Management of Nuclear Power Plants

102. In 2005, the nuclear safety related TC projects in the Europe region continued to focus on 11 countries operating or decommissioning nuclear power plants (Armenia, Bulgaria, Czech Republic, Hungary, Kazakhstan, Lithuania, Romania, Russian Federation, Slovakia, Slovenia and Ukraine). The Agency's assistance was primarily aimed at strengthening national regulatory capabilities, enhancing safety assessment capabilities and risk-informed decision making of utilities and regulatory bodies, enhancing nuclear power plant operational safety, and improving design basis documentation and configuration management at nuclear power plants. In October 2005, the TC programme also supported the first Operational Safety Review Team (OSART) mission in the Russian Federation, which was successfully carried out at the Volgodonsk nuclear power plant.

103. Through a regional project, the Agency provided technical support for conducting a comprehensive study to analyse energy security concerns in the Baltic region (Estonia, Latvia and Lithuania), and to assess the role nuclear power could play in addressing these concerns. An earlier study on Lithuania's electricity options after closure of Ignalina nuclear power plant in 2009, showed that current commercially available unit sizes of nuclear power would be an economically viable option within the borders of the country. However, a regional approach involving neighbouring countries may change the prospect for nuclear power. The Agency's energy planning models were used to conduct the quantitative analysis. These models will also help the Member States answer questions related to how new nuclear generating capacity can compete in deregulated/liberalized electricity markets and how nuclear power might fit into long-term development plans. The growing trends for energy/electricity trade among neighbouring countries require evaluation of supply possibilities in other countries and pooling of resources at the regional and sub-regional level.

104. The area of TC activity related to plant life management was the licence renewal and subsequent life extension of nuclear power plants. With the increased awareness of security of energy supply and rising fossil fuel costs, Member States with nuclear power plants are seeking the possibility of increasing power output and lifetime extensions since many units are approaching the end of their planned life cycle. The Agency support assisted Member States to develop the regulatory basis for licence renewal and prepare management programmes for ageing nuclear power plants. In this respect, national programmes in the Russian Federation and in Hungary adopted a series of regulatory standards and guidelines, which have been applied during the licence renewal processes.



In Romania, fresh LEU fuel was loaded at the Pitesti research reactor in January 2005, after removal of the HEU fuel from the reactor core and preparation of this fuel for repatriation.

B.4. Latin America

105. In 2005, the TC programme provided support to 21 Member States through 133 national projects and 43 regional projects. Disbursements in the region for 2005 by area of activity are provided in Figure 5.

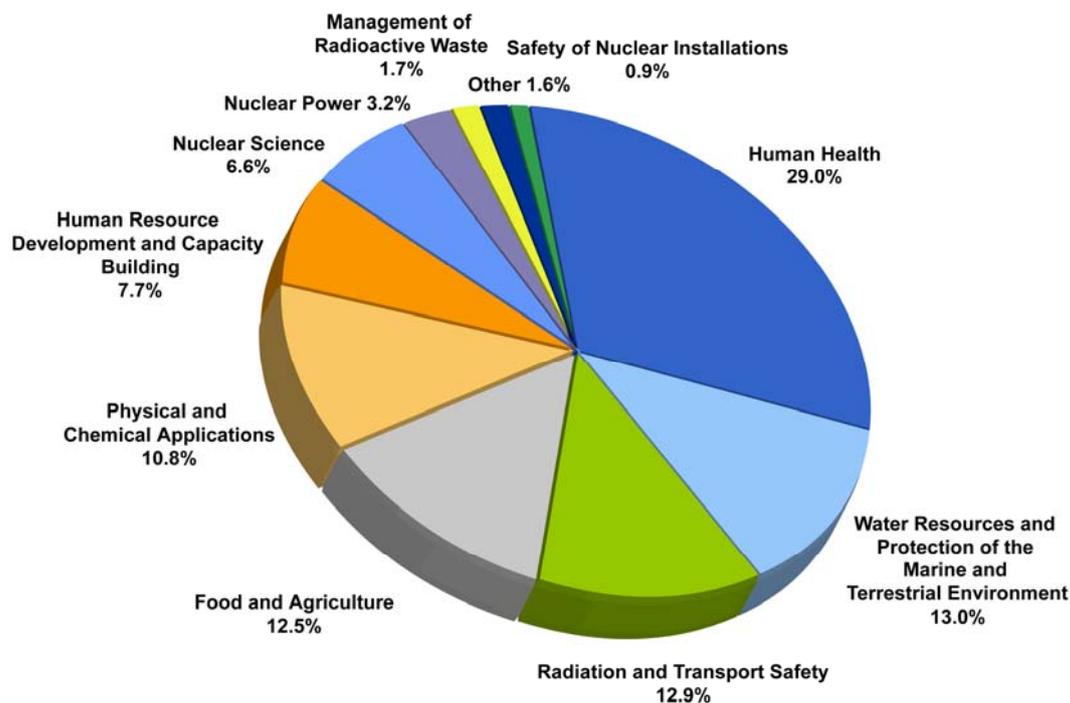


Figure 5. Disbursements by area of activity in the Latin America region for 2005.

106. In order to enhance and strengthen the skills of national counterparts for the preparation of the 2007–2008 TC cycle, the Division for Latin America held two regional workshops during the last quarter of 2005. The workshops were focused on results-based management and project formulation, and approximately 100 national counterparts of potential projects were trained in the Logical Framework Methodology. This knowledge is now being applied to the formulation of the projects.

B.4.1. Strengthening Emergency Response Capabilities

107. National capabilities to respond to radiological or nuclear emergency threats were strengthened through a regional ARCAL project. The project also supported the participating Member States in developing mechanisms for coordinating preparedness and harmonizing response arrangements in the Latin America region. The following achievements have been made:

- Advancement on the implementation of the integrated national response plans for nuclear or radiological emergencies in those countries where an integrated national emergency response system existed (Argentina, Brazil, Cuba, Mexico and Uruguay).
- Adoption of mechanisms to create such systems in those countries where it did not exist (Chile, Peru and Venezuela).
- The number of countries that assessed their threats according to the Agency guidance increased from a baseline of 22% to 77%.
- All participating countries are working in coordination with national emergency response organizations.

- 88% of the countries have established a 24-hour contact point for receiving notification and activation of national response capabilities.
- More than half of the countries have implemented arrangements for providing information and issuing instructions/warnings to the public according to Agency guidance.
- The percentage of countries that have arrangements in place for managing the medical response has increased from 33% to 44%.
- 55% of the countries are prepared to conduct an initial assessment of the emergency situation and conduct recovery operations.

B.4.2. Evaluating a Marine Ecosystem

108. The problem of contamination produced in the interior and marine waters in Cuba has been aggravated by the deficient sewer network in the country. The country is facing a situation where the sewage plants have deteriorated, the stabilization pools are not working properly due to lack of maintenance, there is a lack of treatment of industrial wastewater and the control and monitoring programmes of the water quality are diminishing due to scarce materials and financial resources. Through the project, the Agency has transferred nuclear techniques as tools for the study of the environmental processes.

109. The Agency has joined the efforts of the GEF in cooperating with the National Environment and Development Programme, particularly for the protection of the Sabana-Camagüey Archipelago. As a result of the monitoring programme of the Cuban marine ecosystem, the National Group for Coastal Zones has evaluated the environmental situation of the country's ecosystems, and identified the problems and remedial actions that need to be taken, and thus contributed to the conservation of the Cuban environment.

B.4.3. Improving Animal Reproduction

110. An estimated 150 000 Peruvian families, located in regions of extreme poverty, depend directly upon alpaca and llama herds for their survival. They hold approximately 80% of the national alpaca population, and virtually all of the llamas, which are reared in small, scattered herds, located in inaccessible, inhospitable, high-elevation areas. Despite these conditions, an estimated 3 750 000 alpacas produce annual meat and fibre production totalling 8198 and 3272 tons, respectively (Ministry of Agriculture report), making a significant contribution to the national economy.

111. Through a TC project, the Agency has been supporting the Government of Peru in improving the productivity of herds for fibre quality and to conserve varieties of alpacas and llamas. This project is aimed at the recovery, conservation of biodiversity and improvement of varieties of highly productive alpacas by using molecular genetic tools and radioisotopes, and to make available the technology and information to the breeders.

112. UNIDO is also supporting Peru to become more competitive in the production and export of alpaca textiles. The Agency has combined efforts with UNIDO and Peru and added value to the improvement of alpaca reproduction. The improved alpaca and llama reproduction rate can generate a significant economic impact among small farmers.

B.4.4. Partnering to Control Malaria

113. Malaria is a public health problem in many countries in Latin America. In the Andean region of Latin America, which includes Bolivia, Colombia, Ecuador, Peru and Venezuela, almost half a million cases have been detected in recent years. Gradual changes have occurred in the approach and

orientation of initiatives concerning the global strategy to combat malaria, including the Roll Back Malaria (RBM) programme.

114. The Global Fund to Fight AIDS, Tuberculosis and Malaria has approved \$26 million for the Andean region to develop a comprehensive programme to prevent and control malaria in the region during the period 2004–2008. This programme is coordinated by the Andean Health Organization (ORAS) which works closely with the Agency in order to combine efforts and complement each others' activities to provide the maximum benefits for the Andean region.

B.4.5. Controlling Fruit Flies for Export Benefits

115. As a result of a regional project, a number of areas in each of the participating countries has officially been recognized as either free of fruit flies or had low prevalence. This achievement allows the export of horticultural products from these areas. For example, papaya grown in Guatemala no longer requires quarantine treatment, and Nicaragua is now exporting bell peppers to the USA.

116. In December 2005, the Animal Plant and Health Inspection Service of the United States of America officially recognized, through publication in its Federal Register, all of Patagonia in Argentina as a fruit fly free region. This major success culminates ten years of Agency and FAO technical backstopping to Argentina in terms of implementing the sterile insect technique as part of an area-wide integrated pest management approach. This achievement will allow Patagonia to export fresh fruits and vegetables to the USA without any quarantine treatments, which according the Servicio Nacional de Sanidad y Calidad Agroalimentaria of Argentina, represents annual savings of \$2 million. The elimination of these costly quarantine treatments applies to most of the 3 million boxes of quality pears and apples that this region also exports to many other regions in the world.

B.4.6. Applying Nuclear Technology for the Sustainable Use of Natural Resources

117. Know-how gained through Agency support in detecting leaks in dams is being applied throughout El Salvador. The Lempa River is a major surface water resource in El Salvador, used for many purposes, including hydropower generation, which represents nearly 30% of the country's generation capability. The project assisted El Salvador in improving its national capabilities for the detection of leaks in hydroelectric power station dams using environmental isotope techniques, as well as the leaks' origins and pathways.

118. Through project RLA/8/028, 'Transfer of Tracer Technology and Nucleonic Control System to Industrial Sectors of Economic Interest (ARCAL LXI)', which was supported by the French Government, six regional resource centres were established for training in the application of tracer technology and nucleonic control systems in different industries, namely Argentina for the oil industry, Brazil for water treatment plants, Chile for mineral ore processing and metallurgy, Cuba for the sugar industry, Peru for the cement industry and Venezuela for gamma gauge systems.

119. The project contributed to strengthening the regional use of radiotracer and nucleonic gauge technologies in raw material processing industries to improve the quality of products and services. The application of these techniques in the different industries will lead to a reduction of production costs, which in turn will conserve raw materials, reduce energy consumption, and protect the environment.

120. The soils of Jamaica have been shown to contain remarkably high concentrations of uranium, thorium, arsenic, and heavy metals (cadmium, chromium, copper, mercury, nickel, lead and zinc). The Government of Jamaica through the International Centre for Environmental and Nuclear Sciences (ICENS) has developed a programme with the assistance of the Agency, which seeks to establish the elemental concentrations in Jamaican foods to properly guide dietary advice, and eventually to recommend food standards. Concerns about the perceived harmful effects of heavy metals on food

quality and safety have led to regulations on the elemental contents of foods. The Agency has been supplementing the capabilities of ICENS in the utilization of its SLOWPOKE research reactor, especially with the development for neutron activation analysis and total reflection X-ray fluorescence that support the programme for detection of cadmium in food, particularly in yam, an important item in the local diet and an export crop earning more than \$12 million per year. The objective is to allow selection of optimal growing areas and agronomic practices, and to control the intake of potentially hazardous substances.

B.4.7. Following the Impact One Project Can Make: QA/QC in Mammography Studies

121. A regional project in QA/QC studies for mammography was started in 2001. The Agency's assistance focused on reviewing QC issues and elaborating a QC protocol in mammography as part of the QA/QC programme adopted in the pilot centres of the following participating countries: Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Nicaragua, Panama, Paraguay, Peru and Venezuela. This protocol has already been implemented totally or partially in all of the participating countries, and the protocol has been submitted for publication as an IAEA TECDOC. The project also enabled the optimization of patient protection, improved the human resource capabilities for the establishment of research programmes on QC protocols for mammography, and set up a collaborative network of specialists in the field to share information. Moreover, the cost of mammography services has been reduced by lowering the rate of film rejection, lowering the dose given to patients and reducing the operational costs of the centres. These improvements are helping to increase the rate of early detection of breast cancer, and are thus contributing to a reduction of the breast cancer mortality rate in the participating countries of the region.



*In Guatemala, this dosimetry laboratory provides calibration services needed to keep cobalt therapy machines performing properly. For more information, go to <http://tc.iaea.org> to watch the video *Handle With Care*.*

C. Management, Financial Resources and Programme Delivery Indicators

C.1. Enhancing the Effectiveness and Efficiency of the Programme and Technical Cooperation Management

C.1.1. Implementing the New Organizational Structure of the Department of Technical Cooperation

122. Restructuring of the Department of Technical Cooperation continued in 2005, with the Director General approving the proposal for the new structure of the Department to take effect in December 2005. The overall objective of the new structure is to improve working arrangements in order to enhance the quality, effectiveness and efficient operation of the TC programme.

123. The Department of Technical Cooperation’s organizational structure has a greater focus on the regions and on understanding and responding to regional priorities and those of individual Member States.

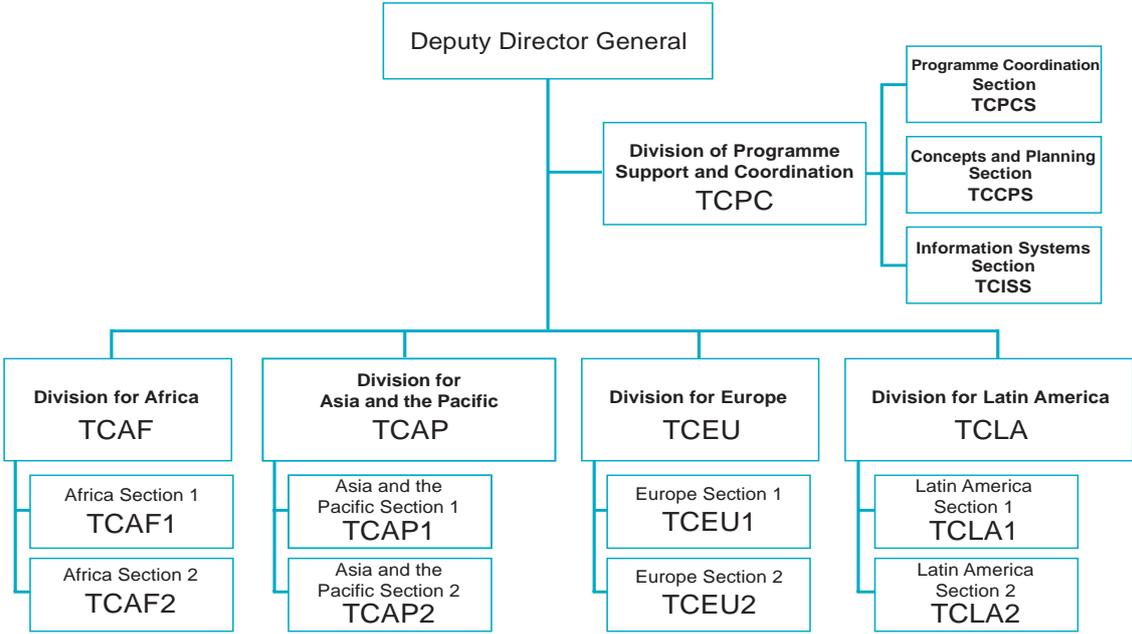


Figure 6. New organizational structure for the Department of Technical Cooperation.

124. Under the new structure, each regional Division has two Sections. The assignment of Member States to Sections provides for the appropriate balance between funding and workload distribution. In addition, each Member State has a team assigned to it that carries out all aspects of programme design and delivery. This way, teams are able to take factors such as sub-regional priorities, existing cooperative arrangements, thematic and Country Programme Framework (CPF) focus areas, and technical cooperation among developing countries (TCDC) opportunities into account.

125. The Division of Programme Support and Coordination leads the development and implementation of the TC Strategy and supports overall programme management. It also provides advice services to the regional Divisions and the Deputy Director General, Head of the Department of Technical Cooperation.

C.1.2. Recognising the Value of Country Programme Frameworks

126. The Country Programme Framework (CPF) is an agreed document between a Member State and the Agency describing national priority needs, interests and socio-economic objectives and identifying the areas where Agency technical support and cooperation on nuclear science and technology, as well as nuclear safety and security, can best contribute to achieving those national development objectives in a cost-effective manner. The CPF process confirms the roles and responsibilities of both partners and identifies the essential requirements for successful technical cooperation.

127. A total of 99 Member States have concluded or drafted CPFs. Most recently, these Member States include Argentina, Chile, Eritrea, Gabon, Haiti, Nigeria, Tajikistan, United Republic of Tanzania and Zimbabwe. It is expected that all Member States will eventually participate in the CPF process as a principal means for expressing their needs, interests and priorities as full partners in the Agency programmes. In addition, during 2005, a draft of comprehensive guidelines for CPFs was developed. This action was taken in response to recommendations from external auditors and the Standing Advisory Group for Technical Assistance and Cooperation (SAGTAC).

C.1.3. The Programme Cycle Management Framework

128. During the year, the TC Programme Cycle Management Framework (PCMF) was developed and began operation. It is based on a flexible methodology, which promotes a participative and interactive approach and emphasizes Member States' prioritization and ownership of the projects. It relies on current best practices, user-friendly web-based information technology (IT) systems and the principle of teamwork. The framework increases the Member State's ability to take ownership and responsibility for the formulation and execution of its programme, while allowing stakeholders in the Secretariat to support the process and to collaborate in a transparent manner. It is linked to the CPFs through the identification of project concepts, which are developed into projects, based upon assessed needs of Member States and joint appraisals in the field. More specifically, this improved approach:

- focuses more on Member State needs assessment and problem analysis supported by the Secretariat.
- streamlines and makes more efficient and transparent the selection, appraisal and approval processes, while enhancing the project quality.
- increases the participation and teamwork of all stakeholders from the outset.

129. The IT system is being developed in a phased manner, i.e. the portal with full functionality will not be available from day one. However, as the various components are deployed, they will contribute to the overall functioning of the application.

C.1.4. Surveying Satisfaction with the TC Programme

130. The Department of Technical Cooperation embarked on a change initiative aimed at enhancing the quality of the TC programme and improving the working arrangements with Member States and within the Secretariat. In order to establish a baseline for further assessment of the effectiveness of the changes, the Department conducted surveys on stakeholder satisfaction with the TC programme.

131. From Member States, National Liaison Officers, national coordinators, project counterparts and representatives at Missions in Vienna were asked to participate in the survey. Almost 30% of those contacted participated in the survey, and they were distributed roughly equally among the regions. The survey participants rated their satisfaction with the formulation and the implementation of the 2005–2006 TC programme, with the results of TC projects and with communication with the Department of Technical Cooperation, as shown in Figure 7. They also provided suggestions for improving the administration of the TC programme, a number of which are already being addressed through the change initiative. With the baseline established through the surveys, further assessment of the effectiveness of the changed working arrangements with the Member States and in the Secretariat will be conducted.

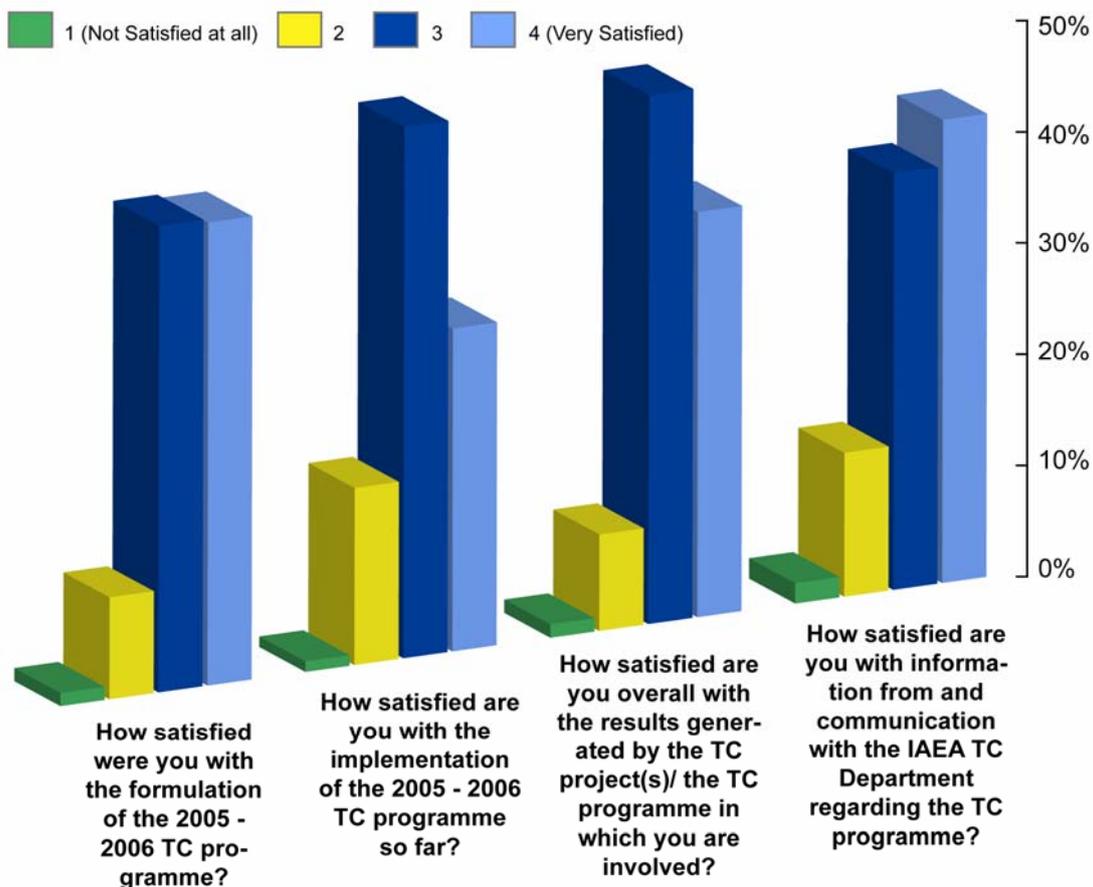


Figure 7. Member State responses to satisfaction survey.

C.2. Summary of Financial Indicators for 2005

132. Financial indicators, including the value of the programme to be delivered, new resources, disbursements and new obligations for 2005 were all above 2004 levels.

133. Resource levels were the highest ever, both in total and in each of the resource types. New resources made available for the TCF rose to \$75.8 million, and extrabudgetary sources provided a total of \$14.9 million, including \$1.8 million from the Nuclear Security Fund for implementation of the nuclear security Plan of Activities included in TC projects. Assistance valued at \$1.2 million was provided in-kind by 57 Member States and 8 international organizations. Together, these resulted in total new resources for 2005 of \$91.9 million, as compared with \$87.1 million in 2004.

134. These resources, and funds carried forward from 2004, supported a programme valued at \$116.0 million, the largest programme ever approved for implementation. At 31 December 2005, the programme funded by the TCF stood at \$97.5 million, an increase of 9% above the 2004 level. The programme funded by extrabudgetary funds stood at \$18.6 million at year-end, an increase of 25% over the 2004 value of \$14.9 million, clearly reflecting the increasing level of this resource.

135. Delivery, as measured in financial terms, was also above 2004 levels with disbursements reaching \$73.6 million, as compared with \$73.3 million in 2004. Net new obligations, a financial measure of the programme set in motion during the year, reached an all-time high of \$79.6 million, up from \$71.0 million in 2004. Because the total programme had also increased by nearly \$12 million, this record level, measured against the programme to be delivered, resulted in an implementation rate of only 68.6%, which was up from 68.1% in 2004.

136. Figure 8 provides a comparison of new TC resources with new obligations during the period 2001 through 2005. As can be seen, resource levels exceeded obligation levels in both 2004 and 2005, resulting in a carryover of resources into the next year. The goal of the recently completed restructuring of the Department of Technical Cooperation, the ongoing review of processes and procedures and the implementation of a quality management programme is to enhance the delivery of the TC programme, thus resulting in a better use of available resources.

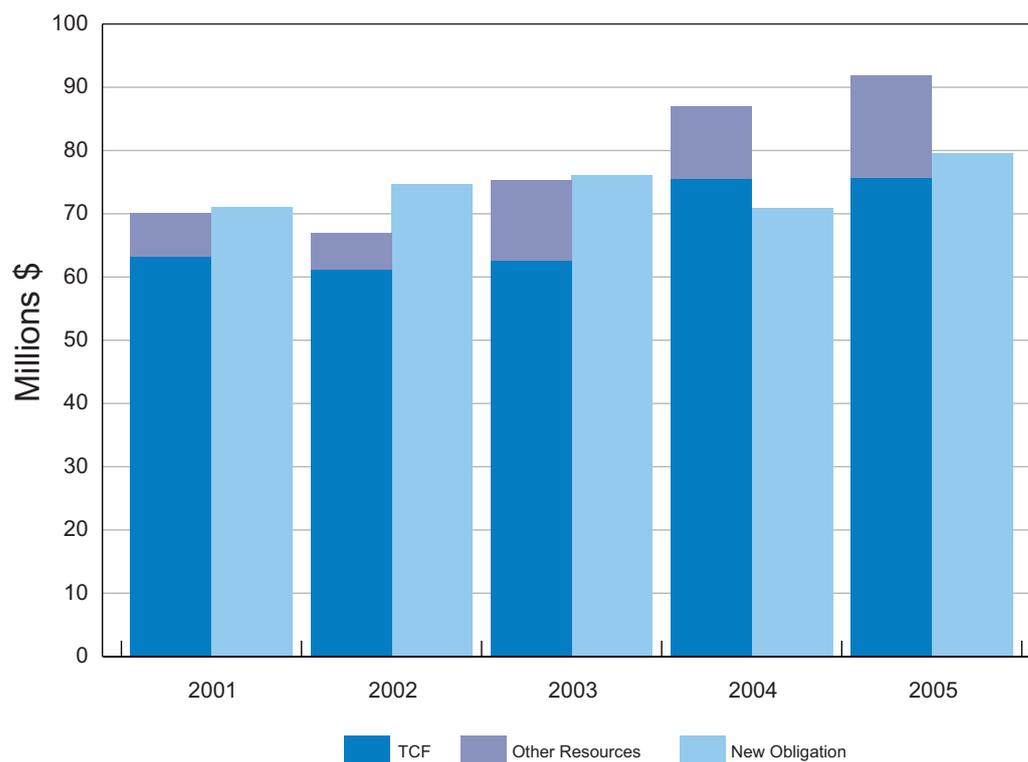


Figure 8. Comparison of new TC resources with new obligations for 2001–2005.

C.3. Technical Cooperation Fund

137. New resources for the TCF totalled \$75.8 million, a slight increase over the \$75.6 million received in 2004. However, it should be recalled that some \$8.1 million in resources received in 2004 were payments toward TCF targets for years prior to 2004. Pledges and payments against the 2004 target received in 2004 totalled \$65.2 million by 31 December 2004, representing 87.2% of the target of \$74.75 million. In 2005, pledges and payments against the 2005 target amounted to \$69.4 million by the end of the year, representing 89.5% of the target of \$77.5 million. The rate of attainment, which reflects only payments against TCF targets, stood at 88.9% at the end of 2005. This rate compares favourably with the rate of 86.6% attained at the same time the year before.

138. Some \$3.4 million flowed into the TCF in 2005 through the payment of NPCs, which were due for the first time this year. A separate report on the experience to date with the introduction of NPCs can be found in document GOV/INF/2006/8.

139. Payments of arrears on assessed programme costs in the amount of \$0.8 million were made in 2005, bringing the outstanding balance for these arrears down to \$4.5 million as of 31 December 2005. Some \$1.2 million of this amount is attributable to countries that have set up a formal payment plan to complete payment of these arrears. Other Member States are strongly encouraged to take the steps necessary to pay these required amounts as soon as possible.

140. Delivery of the programme in financial terms is measured both by disbursements (actual cash outlays made during the year) and by net new obligations, which measure the net value of actions implemented during the year. Disbursements from TCF resources totalled \$64.7 million, up slightly from 2004 levels. It should be noted, however, that disbursements are often dependent on suppliers submitting an invoice, and may not be directly related to activities actually undertaken during the year. A more reliable indicator of implementation set in motion is represented by the net new obligations.

For 2005, net new obligations funded from the TCF totalled \$68.7 million, up by \$5.6 million from \$63.1 million in 2004.

141. Table 1 provides a review of the unobligated balance at 31 December for the years 2001 through 2005. While the disbursement and net new obligation figures indicate increased implementation, the increased level of resources and the larger programme to be implemented indicate that efforts to restructure and streamline implementation processes are both necessary and timely.

Table 1. TCF 2001—2005: Structure of the Unobligated Balance (\$)

Description	2001	2002	2003	2004	2005
Total unobligated balance	17 131 000	9 968 000	6 408 000	18 865 000	25 954 000
Pledges not yet paid	(2 704 000)	(2 882 000)	(3 298 949)	(2 484 331)	(1 638 570)
Non-convertible currencies which cannot be utilized	(1 878 000)	(1 162 000)	(1 171 466)	(12 612)	(12 004)
Currencies which are difficult to convert and can only be utilized slowly	(3 468 000)	(4 382 000)	(4 280 648)	(6 179 396)	(7 442 196)
Resources which can be used for TC programme obligations	9 081 000	1 542 000	(2 343 062)	10 188 661	16 861 230

C.4. Extrabudgetary Contributions

142. Extrabudgetary resources continue to represent an ever increasing share of the overall TC programme resources as compared with five years ago. A total of \$14.9 million in new resources was received from various sources during 2005. As mentioned earlier, funds provided by donor countries for assistance in other Member States accounted for \$8.1 million, more than 50% of new extrabudgetary resources. Funds in the amount of \$5.4 million were provided through government cost-sharing arrangements, a mechanism which is strongly encouraged. Contributions from international organizations accounted for \$1.4 million. Included in the total of \$14.9 million in extrabudgetary resources are some \$1.8 million in resources from the Nuclear Security Fund (NSF) for implementation of the nuclear security Plan of Activities.

143. In-kind contributions, although representing a relatively small portion of total resources, nevertheless can play an important role in specific projects or activities. In 2005, contributions totalling \$1.2 million were made by 57 Member States and 8 international organizations. In-kind contributions are credited to Member States that have made available the following types of support:

- providing expert and training course lecturer services fully or partially cost-free in countries other than their own, and sponsoring training course participants from countries other than their own;
- providing all or partially cost-free fellowship training (type II fellowships); and
- donating equipment that is received by another Member State.

144. In-kind support for training, in the form of fellowships, scientific visitors and training courses accounted for \$0.8 million, with an additional \$0.4 million for experts, lecturers and meeting participants.

C.5. Programme Delivery Indicators

145. Delivery of the TC programme can also be measured using a number of non-financial indicators. Each of those reflect careful planning, technical input and evaluation, the identification and successful contracting of suppliers, and monitoring, follow-up and review of the inputs and outcomes. All of these actions must be taken in cooperation with the recipient institutes and Member States who have an important role to play in seeing that the programme can be effectively implemented in the counterpart institutions.

146. The Supplement to this document provides extensive information on the various indicators, both financial and statistical. A brief summary and comparison with 2004 levels is provided in Table 2 below.

Table 2. Delivery of Outputs: 2004 and 2005.

Indicator	2004	2005	2005 compared with 2004
Adjusted Programme	\$104 244 649	\$116 018 236	\$11 773 587
Net New Obligations	\$70 955 517	\$79 590 436	\$8 634 919
Implementation Rate	68.1%	68.6%	
Disbursements (including In-kind)	\$73 333 502	\$73 556 997	\$223 495
International Expert and Lecturer Assignments	2 618	2 784	166
Meeting/Workshop Participants	2 296	3 202	1 006
Fellowships and Scientific Visitors in the Field	1 444	1 436	(8)
Training Course Participants	2 041	1 574	(467)
Training Courses	151	104	(47)
Purchase Orders Placed	2 572	2 991	419
Subcontracts Issued	6	8	2

147. A summary by Agency Programme of the disbursements made during 2005 has been included at the beginning of this report in the section titled 'The Agency's Technical Cooperation Programme at a Glance'.

Glossary

adjusted programme - the total value of all technical cooperation activities approved and funded for a given calendar year plus all approved assistance brought forward from previous years but not yet implemented. It is against this figure – which is not identical with resources actually available – that the implementation rate is measured.

assessed programme costs (APCs) - the cost charged to Member States receiving technical assistance, amounting to 8% of the assistance actually provided from both the Technical Cooperation Fund and extrabudgetary contributions (but excluding UNDP-financed assistance). This mechanism was suspended in 2004, and replaced by National Participation Costs (see document GOV/2004/46).

central criterion - A project meets the central criterion if it can be shown that it is in an area of national priority that enjoys strong government support. This means that:

- It is in an area where there is a national programme enjoying strong government commitment with evidence of significant financial support; or
- It is clearly related to a core competency of the Agency (i.e. it is safety related or deals with nuclear power operations or radioactive waste management) and it has a good chance of achieving its expected result.

Country Programme Framework (CPF) - a descriptive planning process that provides a concise frame of reference for future technical cooperation with Member States agreed in a document between the concerned State and the Agency.

disbursements - actual cash outlays for goods provided and services rendered.

due account - the mechanism by which the Agency accords preference in terms of Technical Cooperation Fund allocations and procurement to those Member States with a good record of financial support to the technical cooperation programme. The objective is to increase the level of contributions to the Technical Cooperation Fund. Previously, it was also intended to improve the record of payment of assessed programme costs.

earmarkings - amounts allotted for funding approved assistance awaiting implementation.

extrabudgetary funds - funds provided by Member States or organizations for financing specific projects or activities. They also include funds received from Member States to finance assistance for themselves. These funds are separate from voluntary contributions to the Technical Cooperation Fund.

footnote-a/ projects - projects approved by the Board for which no immediate funding is available.

government cost-sharing - funds provided by Member States to augment projects in their own country.

implementation (in financial terms) - the volume of funds obligated (new obligations) in a given period.

implementation rate - a ratio obtained by dividing implementation by the adjusted programme (expressed as a percentage), reflecting the financial rate of implementation.

in-kind - the value assigned to non-cash contributions.

National Expert – technical cooperation expert who works for a project in his/her own country.

National Participation Costs (NPCs) –Member States receiving technical assistance are assessed a charge of 5% of their national programme, including national projects and fellows and scientific visitors funded under regional or interregional activities. At least half of the assessed amount for the programme must be paid before contractual arrangements for the projects may be made. This mechanism replaces assessed programme costs, which were suspended in 2004 (see document GOV/2004/46).

new obligations - the sum of disbursements during the year plus year-end unliquidated obligations minus unliquidated obligations carried over from the previous year.

new resources - the total value of not previously reported funds received in a calendar year.

overprogramming - the establishment of programming levels that exceed available resources.

Programme commitments - total disbursements plus unliquidated obligations for the current year plus earmarkings.

Programme Cycle Management Framework (PCMF) – an approach to the technical cooperation programme, facilitated by an IT platform for registered users to develop and manage technical cooperation projects from project concept submission through project design, approval, implementation and evaluation. It provides all stakeholders (in Member States and the Secretariat) with access to their projects and facilitates real-time interaction between members of the project team.

programme year - the year in which a technical cooperation project is planned to start.

Programme Reserve - an amount set aside by the Board each year for financing assistance of an urgent nature requested after the Board has approved the technical cooperation programme for the year in question.

rate of attainment - a percentage arrived at by taking the total voluntary contributions paid to the Technical Cooperation Fund by Member States for a particular year and dividing them by the Technical Cooperation Fund target for the same year. As payments can be made after the year in question, the rate of attainment can increase over time.

rephasing - a reallocation of project funds approved for inputs which were planned for a given programme year and which cannot be implemented as scheduled. Rephasing does not change total inputs approved for a project; rather, it serves to keep project planning realistic.

Technical Cooperation Fund (TCF) - the main fund for the financing of the Agency's technical cooperation activities; it is supported by voluntary contributions from Member States, assessed programme cost arrears and National Participation Costs paid by Member States and miscellaneous income.

Thematic Plan - a prescriptive planning process that focuses on the technology-problem link where TC projects have successfully demonstrated a significant contribution to national socio-economic development, or where solid evidence exists to predict such a contribution.

type II fellowships - fellowships provided by Member States at little or no cost to the Agency.

usable unobligated balance - the unobligated balance of the Technical Cooperation Fund less the sum of pledges not yet paid and the dollar equivalent of currencies that can only be used with great difficulty. The purpose is to measure the amount of money that is readily available for technical cooperation programme obligations.

unliquidated obligations - obligations incurred for which no cash outlays have yet been made.