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The ARCAL Programme

Over Two Decades of Cooperation in Science and Technology

1. ARCAL, which began in 1984 as the Regional Cooperative Arrangements for the Promotion of Nuclear Science and Technology in Latin America, was elevated in 1998 to a Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean. The Agreement entered into force on 5 September 2005.

2. The attached report was prepared by the Secretariat and a summary in Spanish was presented during a meeting of the Board of ARCAL Representatives (BAR) held on 26 September 2005 during the 49th session of the General Conference.

3. The BAR requested the Secretariat to distribute the full report as an INFCIRC document to all Member States and other potential donors. The Latin American and Caribbean Group (GRULAC) reiterated this request in its statement to the November 2005 meeting of the Technical Assistance and Cooperation Committee (TACC).

4. In response to these requests, the text of the full report is reproduced in this document for the information of Member States.

* As a cost-saving measure, this INFCIRC is being circulated in English and Spanish only.

The ARCAL Programme
Over Two Decades of Cooperation in Science and Technology

A. Executive Summary

1. This report presents a factual analysis of the projects implemented during the first two decades of the ARCAL programme[1].

2. The report starts with a comparison of the planned vs. the actual duration of the ARCAL projects, followed by an analysis of the financial components involved as well as the countries' participation in each of the projects. The report also analyses the ARCAL projects in terms of the development of national capacities. It also shows the sectoral distribution of Agency funds within the ARCAL framework and the changes in the sectoral shares after the introduction of the Technical Cooperation Strategy on 24 October 1997 and the opening for signature of the Agreement in 1998. This report also examines the sectoral composition of the ARCAL programme approved for each biennium together with the evolution of the number of projects by sector and the sectoral participation of each ARCAL participating country through time. It concludes by presenting some concrete achievements of technical cooperation among developing countries (TCDC) resulting from the ARCAL programme.

B. Introduction

3. ARCAL was established in 1984 as the Regional Cooperative Arrangements for the Promotion of Nuclear Science and Technology in Latin America, following the efforts conducted under project RLA/0/006 "Nuclear Science and Technology Development". This project was initiated at the end of 1983 to pave the way towards the implementation of the ARCAL programme. ARCAL was elevated to an intergovernmental cooperation agreement in 1998 following a request by Member States contained in document GOV/1998/42 and approved by the Board of Governors.

4. The objective of the Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL) is to promote, foster, coordinate and implement cooperation activities for training, research, development and applications of nuclear science and technology in the Latin America and the Caribbean region.

5. The Agreement entered into force in September 2005 after Haiti became the tenth State to deposit an instrument of ratification. The entry into force of the Agreement signifies the start of a new phase in the development of the ARCAL programme and represents an opportunity for making the best use of this cooperation instrument for achieving tangible socio-economic benefits in the Latin America and the Caribbean region.

[1] The ARCAL programme celebrated twenty years of existence in 2004. However, the first ARCAL project (RLA/0/006) started at the end of 1983, and is included in this report, meaning that the period covered by this report is twenty-two years.

6. The ARCAL programme has 19 actively participating countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. In addition, Jamaica has participated in some projects.

7. ARCAL participating countries celebrated twenty years of existence of the ARCAL programme in 2004 since the programme took real form in 1985 with project RLA/0/009 "Nuclear Information". It should be noted however that this was the second ARCAL project as preparatory activities had already started in 1983 with project RLA/0/006 "Nuclear Science and Technology Development", which lasted until 1992.

8. ARCAL participating countries have defined five phases of the ARCAL programme during these two decades:

Phase I (1985–1989)

- Establishment of infrastructure in the region to support nuclear technology.
- Identification of countries with advanced capabilities that could assist less developed countries in certain specific areas.

Phase II (1990–1994)

- Use of infrastructure established during the first phase in each country for concrete applications.

Phase III (1995–1999)

- Reinforcement of project results achieved during the first two phases.
- Initiation of actions to create sustainability and independence of the programme.

Phase IV (2000–2004)

- Consolidation of processes to strengthen the programme.
- Ratification of the inter-governmental agreement.

Phase V (2005–2009)

- Progress to achieve mission, vision and strategic objectives.
- Demonstration and recognition of the value added by the programme.

Source: ARCAL Secretariat

9. To celebrate the anniversary of the ARCAL programme, the ARCAL Secretariat issued in 2004 a document in Spanish titled "Outputs and impact of 20 years of ARCAL projects", using inputs provided by participating countries and the information available in the projects.

10. The analysis presented in this report was prepared by the Agency with the aim of complementing the above-mentioned document with a factual analysis of the ARCAL projects implemented under the ARCAL framework since its inception, as registered in the Agency's records.

11. The report starts by presenting very specific information regarding the number, status and duration of the projects, followed by information related to the Agency's financial disbursements to the ARCAL programme, including the number and type of activities conducted. The document also provides information on the participation rate of each country in the ARCAL projects, on the number

of countries per ARCAL project and on the breakdown of ARCAL projects in terms of categories of national capacity development. The last part of the report includes a sectoral analysis using the Agency's fields of activity and some concrete TCDC results obtained through the implementation of ARCAL projects.

C. Number and status of ARCAL projects

12. From 1983 to 2004, the Agency provided technical assistance for the implementation of a total of 69 ARCAL projects. Table 1 presents the current status of these projects.

Table 1. Number and status of ARCAL projects implemented (1983–2004)

Total number of projects completed by 2004	49
Number of projects still ongoing in 2005	20
Total ARCAL projects implemented (1983–2004)	69

Sources: TC-Pride; ARCAL Secretariat.

13. Annex 1 presents a detailed list of all 69 ARCAL projects grouped according to their status.

D. Duration of all ARCAL projects completed by the end of 2004

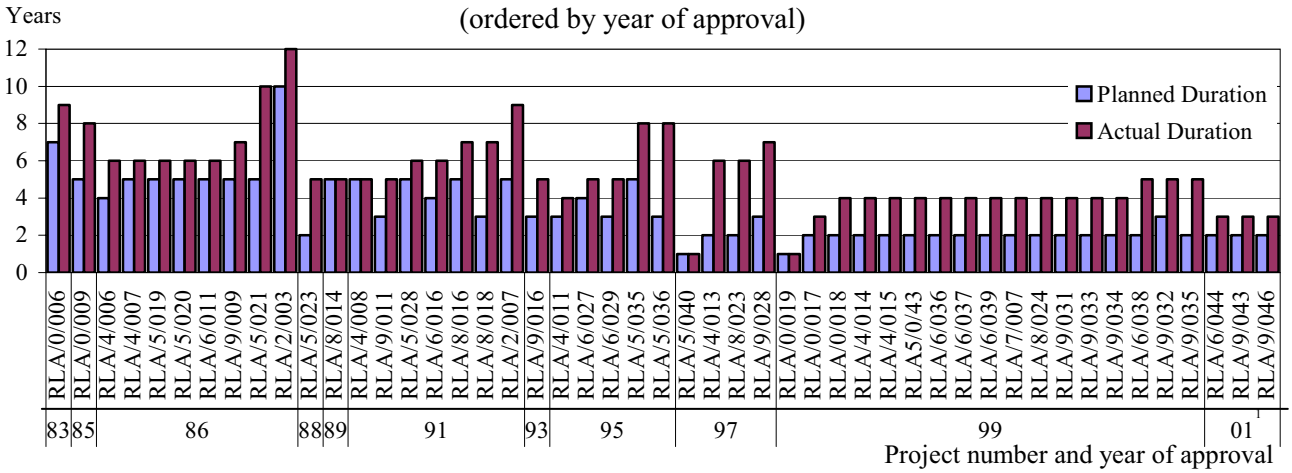
14. The ARCAL projects completed between 1983 and 2004 had an average planned duration of 3.3 years and an average actual duration of 5.3 years.

15. The planned duration of a project is defined as the period between the first year of the approved implementation cycle and the end year of the last approved cycle. Thus, the planned duration reflects the period approved by the Board of Governors, including all extensions and continuations, for conducting implementation activities under each project. On the other hand, the actual duration of the project is defined as the period between the start date and the official completion date, i.e. the date when all financial obligations of the project are officially closed.

16. Figure 1 shows the planned and actual durations of the 49 projects completed by the end of 2004. It also shows a clear relationship between the year of approval of the project and its planned and actual durations. Prior to 1999, projects had an average actual duration of 6.4 years compared with a planned duration of 4.2 years.

17. This implies that during that period projects were extended or continued by more than a two-year cycle. As of 1999, projects were planned to last for one two-year cycle, but their actual duration was on average almost two cycles.

Figure 1. Duration of the 49 ARCAL projects completed by 2004
(ordered by year of approval)



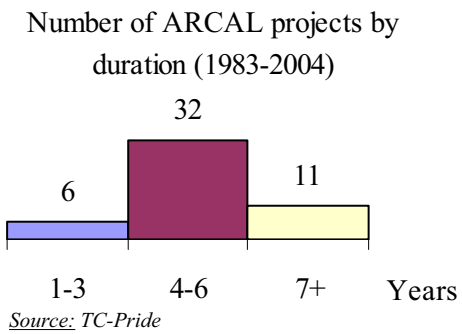
[1]*Figure 1 shows up to year 2001since none of the ARCAL projects approved as of 2002 had been completed by 2004.*
Source: TC-Pride

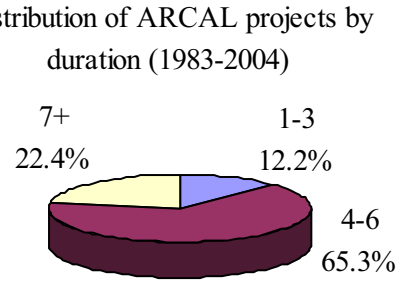
18. Figure 1 also shows that of the 49 completed projects only four projects (RLA/0/019, RLA/4/008, RLA/5/040 and RLA/8/014) were completed within the expected timeframe. The project with the longest actual duration (12 years) was project RLA/2/003, which focused on the determination of trace elements using nuclear analytical techniques. The project with the second longest actual duration (10 years) was project RLA/5/021, which was completed 5 years after the last year of approval. Likewise project RLA/5/036 remained operational 5 years longer than the original approved time. Both of these projects were from the food and agriculture sector.

19. An analysis of project duration by sector shows that projects pertaining to the nuclear chemistry and radiochemistry sector lasted an average of 10.5 years, while projects in the food and agriculture sector had an average duration of 6 years, followed by those in the hydrology and industry sector with 5.8 years. The rest of the sectors (industrial applications; nuclear safety and security; health; biology and environment; and nuclear engineering and technology) had projects with an average duration of approximately 4.5 years.

20. Figure 2 shows that of the 49 completed projects, only 6 (12.2%) where finished within 1 to 3 years, 32 (65.3%) were completed in a timeframe of 4 to 6 years, and 11 (22.4%) lasted more than 7 years.

Figure 2





Source: TC-Pride

21. This demonstrate that there is a need to introduce a new way of defining and quantifying the planned and actual lifetime of the project. The planned completion date of a project should go beyond the last year for which funds are approved to capture the time needed for the project to achieve its outcomes.

E. Total disbursements for all ARCAL projects implemented during 1983–2004[2]

22. From 1983 to 2004, the Agency, through the Technical Cooperation Fund and with extrabudgetary contributions of some donor countries, provided an average annual contribution of approximately $1.4 million to the ARCAL programme. The programme's 19 participating countries have made in-kind contributions corresponding to approximately the same amount for the implementation of the projects.

23. Table 2 shows that from 1983 to 2004 the total amount disbursed for the provision of equipment, expert and training services was approximately $30 million, of which 12.7% came from extrabudgetary contributions (Canada, Chile, Colombia, Ecuador, European Union (EU), France, Germany, Sweden and USA). For reference, Annex 2 presents the related project-specific data. This table also shows that Germany, USA and France have been the largest extrabudgetary contributors to the ARCAL programme, providing 35%, 26% and 19% respectively of the total extrabudgetary funds disbursed. Contributions to the programme have been provided from some Member States on a continuous annual basis, while in the case of others, the contributions have been sporadic.

Table 2. Technical Cooperation Funds and Extrabudgetary Contributions disbursed (1983–2004)

Source of Funds	$	%
Total extrabudgetary, *provided by*[1]:	3 814 413	12.7%
Canada	*18 621*	*0.5%*
Chile	*160 605*	*4.2%*
Colombia	*18 805*	*0.5%*
Ecuador	*2 451*	*0.1%*
EU	*348 781*	*9.1%*
France	*740 624*	*19.4%*
Germany	*1 322 033*	*34.7%*
Sweden	*228 600*	*6.0%*
USA	*973 893*	*25.5%*
Total TCF	26 156 714	87.3%
Grand Total[2]	29 971 128	100.0%

[1] *Nicaragua and Haiti provided a contribution of $1000 each in 2003 and 2004. However, these funds were not disbursed during the above-mentioned period.*
[2] *The numbers in this table have been rounded.*
Source: Official Agency data provided by TCPCS.

24. Table 3 shows the distribution of ARCAL funds by type of activity conducted between 1983 and 2004.

25. Of the total $30.0 million disbursed between 1983 and 2004, $10.6 million (35.5%) were spent on the procurement of equipment, almost $9.8 million (32.6%) on training courses, fellowships and scientific visits, while the disbursements for the provision of expert services, meetings and workshops totalled approximately $9.5 million (31.6%).

[2] Based on official Agency data provided by the Department of Technical Cooperation's Programme Coordination Section (TCPCS) (Annex 2). The figures provided are based on the disbursements made for all 69 ARCAL projects implemented during this period, of which 49 were completed projects and 20 were ongoing projects.

Table 3. Distribution of ARCAL funds by type of activity (1983–2004)

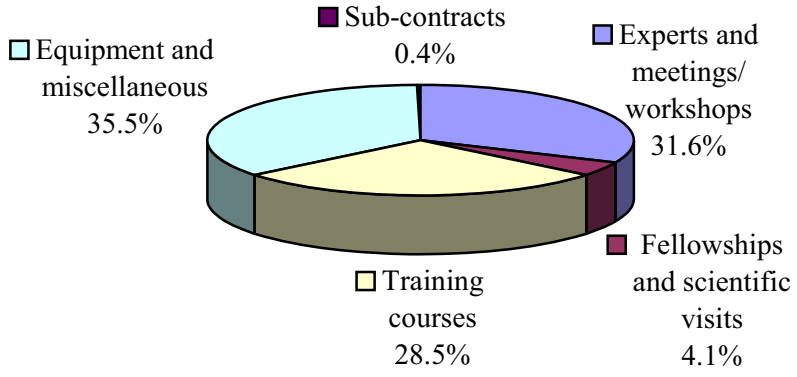
Type of Activity	Disbursements ($)[1]	Percentage
Equipment and miscellaneous	10 625 692	35.5%
Expert services and meetings/workshops	9 462 788	31.6%
Training courses	8 530 735	28.5%
Fellowships and scientific visits	1 236 708	4.1%
Sub-contracts	115 205	0.4%
Total	29 971 128	100.0%

[1] *The numbers in this table have been rounded*
Source: Official Agency data provided by TCPCS.

26. The disbursements for the provision of expert services were accompanied by savings for the Agency's technical cooperation programme of approximately $1.6 million over the past 20 years, since under the ARCAL framework the experts of the region do not receive honorary fees[3].

27. Figure 3 presents the disbursement percentages by type of activity.

Figure 3. Breakdown of ARCAL disbursements for all 69 projects implemented during 1983-2004 (By type of activity)



F. Number of activities conducted under all ARCAL projects implemented during 1983–2004[4]

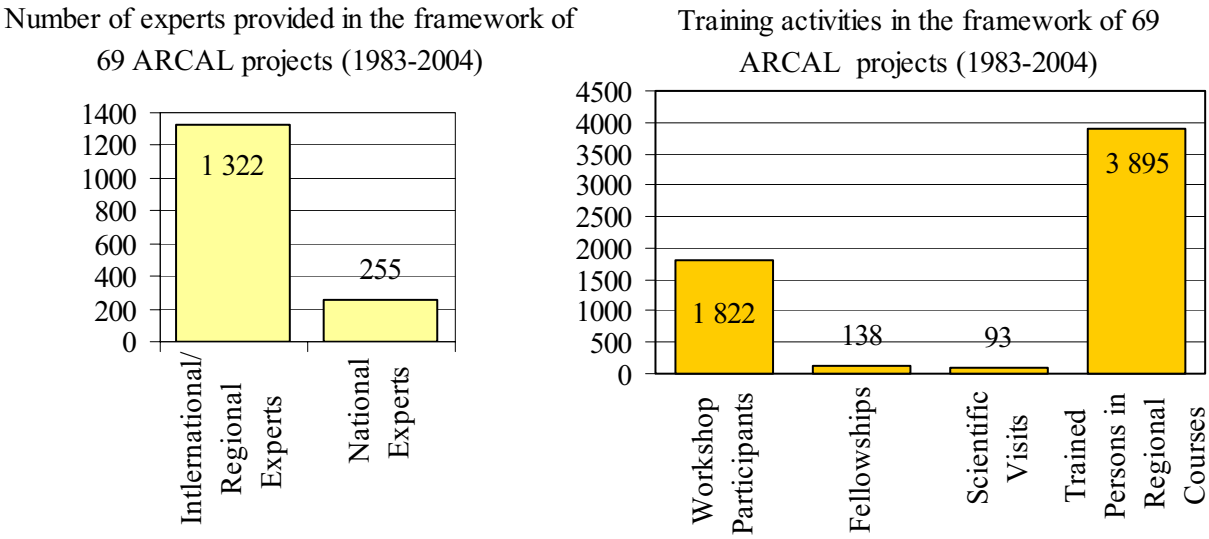
28. Figure 4 shows in one chart the total number of experts (international/regional and national) provided and in the other chart, the number of workshop participants, fellowships, scientific visits, and training course participants in the 69 implemented projects (1983–2004).

29. A total of 1322 international and regional experts provided advice and assistance to ARCAL participating countries. Some 255 national experts participated in expert missions outside their country to provide advice, attend workshops or gain experience from other project stakeholders. In terms of training, 1822 people participated in workshops and 231 people were trained through fellowships and

[3] Figure estimated using official Agency records.
[4] Based on official Agency data provided by TCPCS. The figures provided are based on the disbursements made for all 69 ARCAL projects implemented during this period, of which 49 were completed projects and 20 were ongoing projects.

scientific visits. A total of 294 regional training courses were organized, resulting in the training of 3895 professionals.

Figure 4

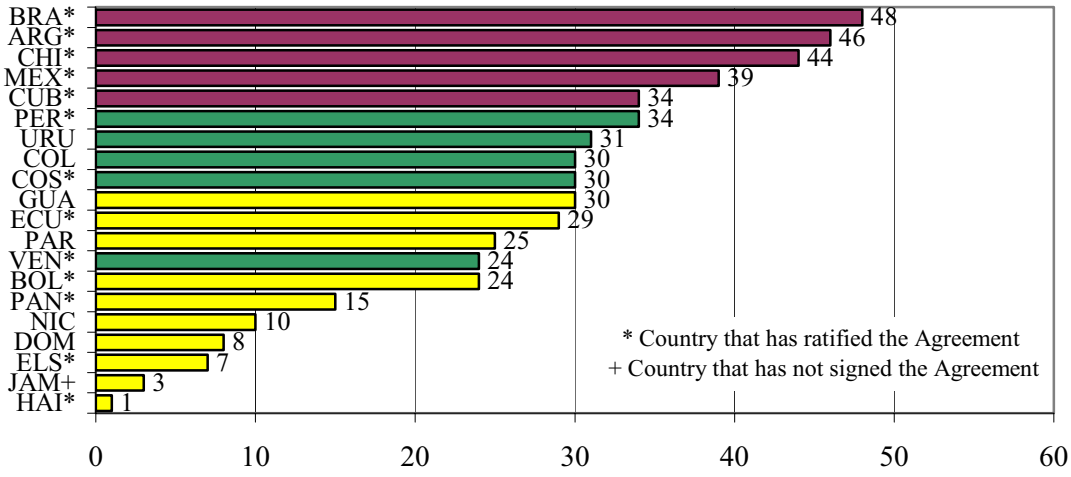


Source: Official Agency data provided by TCPCS.

G. Participation rate of each country in ARCAL projects during 1983–2004

30. Figure 5 presents the total number of completed ARCAL projects in which each country participated.

Figure 5. Number of completed ARCAL projects in which each country participated during 1983-2004 (only completed projects)



Colour Legend: Nuclear technological development of countries

	High nuclear development:	ARG, BRA, CHI, CUB, MEX
	Intermediate nuclear development:	COL, COS, PER, URU[1], VEN
	Low nuclear development:	BOL, DOM, ECU, ELS, GUA, HAI, JAM, NIC, PAN, PAR

Sources: Constructed using data from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL participating countries. For the classification of countries the source was the OIOS Evaluation on Regional Agreements, 2004.

[1]In the OIOS report Uruguay was registered as a country with low nuclear development, however in this analysis, Uruguay is classified under intermediate nuclear development as indicated by the responsible Country Officer.

31. This figure is ordered from the country with the highest participation (Brazil) to the country with the lowest participation (Haiti). It should be mentioned that Haiti joined ARCAL only in July 2002. The figure also shows participation according to the nuclear technological development of countries.

32. The countries with the highest nuclear development had a higher participation rate in the ARCAL projects, while those with the lowest nuclear development had a lower rate. Annex 3 includes a detailed table that shows the specific projects in which each country participated.

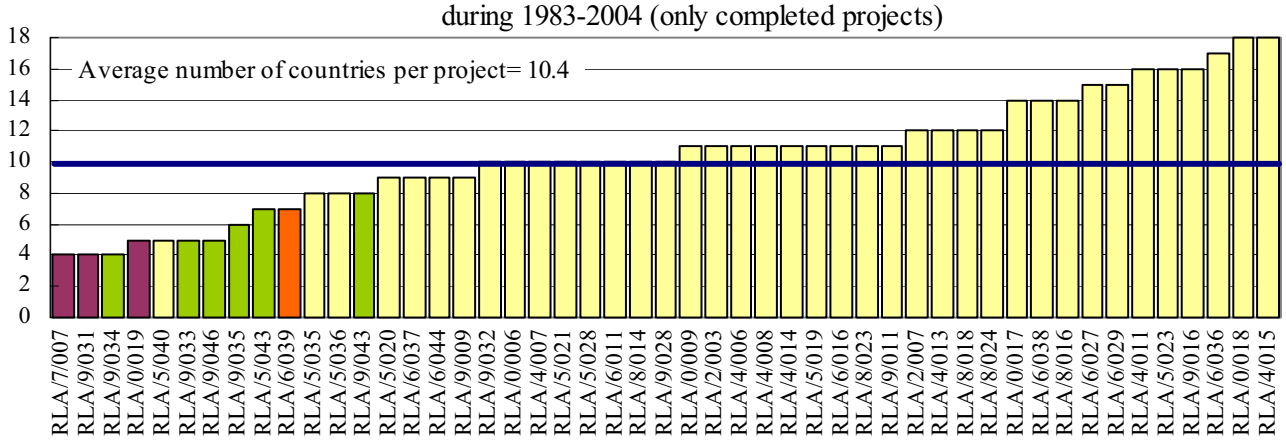
33. This information and that presented in Figure 6 demonstrate that countries with low nuclear development have not managed to implement ARCAL projects without the participation of countries with high nuclear development. During the first 20 years of ARCAL, countries with high nuclear development participated, on average, in 42 of the 49 projects, while those with intermediate nuclear development participated, on average, in 30 projects. On the other hand, countries with low nuclear development participated, on average, in only 15 of the 49 projects.

34. During this period, Haiti participated only in project RLA/0/018, which focused on project formulation. The three countries with the next lowest participation (Jamaica, Dominican Republic and El Salvador) also participated in this project, as well as in projects within the sectors of nuclear engineering and technology (all three countries), health (Dominican Republic and El Salvador), water (Dominican Republic) and safety and security (Dominican Republic and El Salvador).

H. Number of countries that participated in each ARCAL project during 1983–2004

35. Figure 6 presents the number of countries that participated in each ARCAL project completed between 1983 and 2004 (details in Annex 3).

Figure 6. Number of countries that participated in each ARCAL project during 1983-2004 (only completed projects)



Colour Legend: Composition of projects
Only countries with high nuclear development
Countries with high and intermediate nuclear development
All three types of countries: with high, intermediate and low nuclear development
All three types of countries, but with only one country with high nuclear development

Source: Constructed using data from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL participating countries.

36. This figure shows that an average of over 10 countries participated in each ARCAL project completed during this period. The projects with the highest number of participant countries were focused on project formulation (RLA/0/018) and the repair of nuclear instrumentation (RLA/4/015), followed by a project in the field of nuclear medicine imaging (RLA/6/036).

37. Two of the projects with the least number of participating countries (RLA/7/007 "Determining Content of Atmospheric Contamination" and RLA/9/031 "Medical Treatment in Radiological Accidents") had participants of only countries with high nuclear development. The same situation was observed in project RLA/0/019 on "Nuclear Information".

38. Five projects from the safety and security sector (RLA/9/033, RLA/9/034, RLA/9/035, RLA/9/043, RLA/9/046) and one project from the food sector (RLA/5/043) included only countries with high and intermediate nuclear development.

39. Project RLA/6/039 on "Screening and Diagnosis of Hepatitis C" had participants mostly of countries with low nuclear development (Bolivia, El Salvador, Guatemala and Nicaragua). This project also included two countries with intermediate nuclear development (Costa Rica and Peru) and only one country with high nuclear development (Brazil).

I. Analysis of ARCAL projects in terms of the development of national capacities

40. Capacity development[5], defined by the United Nations Development Programme (UNDP) as the ability of individuals, groups, organizations, institutions and countries to perform specified functions or specified objectives effectively, efficiently and sustainably, is now considered the real target of technical cooperation and an essential purpose of development assistance[6]. In this sense, technical cooperation activities are targeted at improving productivity and efficiency by facilitating the acquisition of skills, know-how and productive aptitudes and at increasing self-reliance in the management of national resources by developing the national capacity for managing development.

41. This section presents the composition of ARCAL projects in terms of categories of national capacity development. For this purpose all project activities were revised and classified using four main categories and a number of subcategories as described in Table 4. These are based on the three dimensions of national capacity development used by the UNDP[7] and on additional sources such as Berg et al 1993[8], the Urban Capacity Building Network[9], and the World Bank.

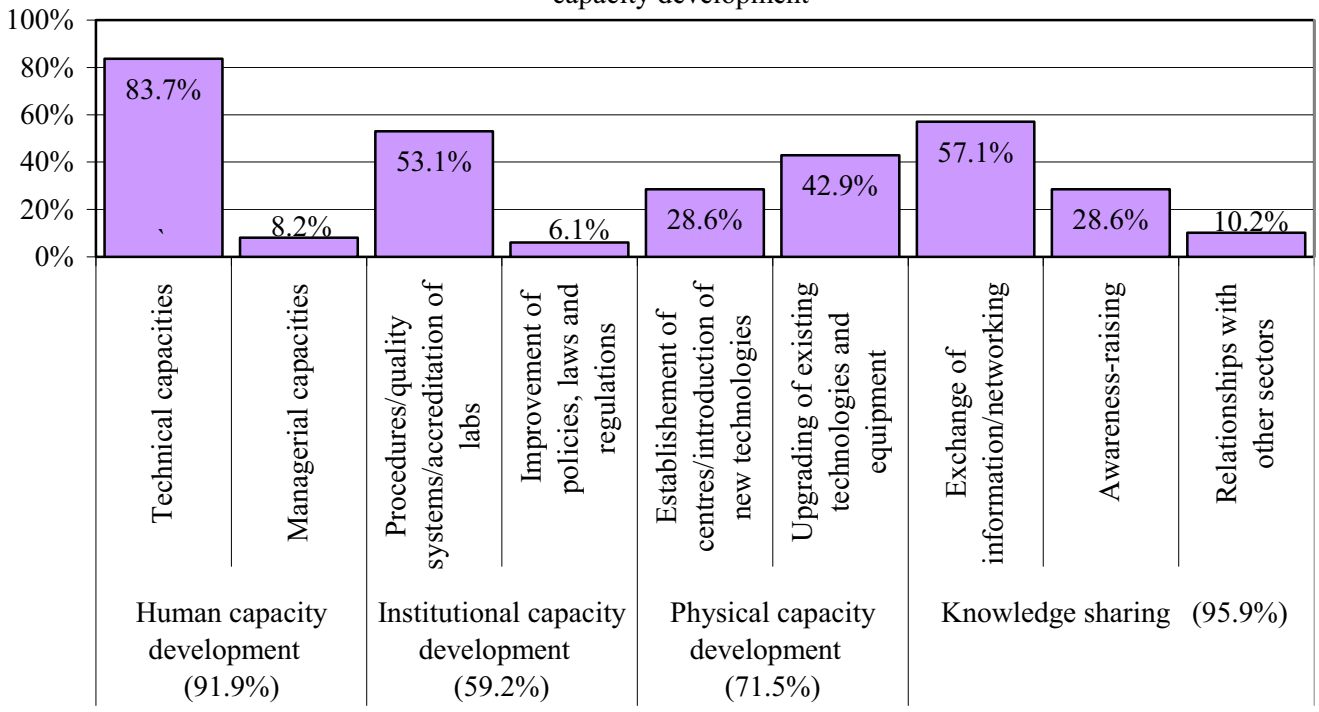
[5] This term is used instead of the term "capacity building", as the latter is a broader concept that includes building capacities and ensuring national ownership and sustainability.
[6] Browne, S. and UNDP (2002), Developing Capacity Through Technical Cooperation: Country Experiences. New York: UNDP
[7] Ibid., pp.2–3: Three dimensions of national capacity development.
[8] Berg, E. and UNDP (1993), Rethinking Technical Cooperation: Reforms for Capacity Building in Africa. New York: UNDP
[9] Urban Capacity Building Network: Defining Capacity Building: http://www.gdrc.org/uem/capacity-define.html

Table 4. Categories for analysing the development of national capacities

I. Human Capacity Development: *Equipping individuals with the understanding, skills, know-how, productive aptitudes and training that enables them to perform effectively* • Development of technical capacities. • Development of managerial capacities.
II. Institutional Capacity Development: *Improvement of processes/procedures, systems and customs, policies, laws and regulations in the public sector, as well as the private sector and civil society* • Establishment of harmonized programmes and quality systems; recognition, certification, and accreditation of laboratories, centres and facilities; improvement of processes, procedures and standards. • Improvement of policies, laws and regulations.
III. Physical Capacity Development: *Supplies and equipment necessary to develop and reinforce the capacity of national institutions and laboratories to perform their work* • Establishment of centres and facilities; introduction of new technologies. • Upgrade of existing technologies and equipment; repair and maintenance of equipment.
IV. Knowledge Sharing: *Adoption, adaptation and application of knowledge in a way that helps staff work more effectively. It is necessary and complementary to human, institutional and physical capacity development.* • Exchange of information and experiences, and networking. • Awareness-raising of development opportunities and efforts. • Establishment of relationships between different organizations and sectors (public, private, community).

42. Figure 7 presents the percentage of projects that included the specified capacity development component.

Figure 7. Analysis of the 49 ARCAL projects completed by 2004 in terms of capacity development



Source: The data used for making this analysis were extracted from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL participating countries.

43. Almost all of the projects (91.9%) had a human capacity development component, of which 83.7% supported the development of technical capacities, while only 8.2% targeted the development of managerial capacities. On the other hand, only 59.2% of the projects had activities related to the development of institutional capacities, of which 53.1% corresponded to the establishment of quality systems, improvement of procedures or accreditation of laboratories and 6.1% to the improvement of policies, laws and regulations. With regard to the 71.5% of projects with a physical capacity development component, almost 43% received supplies and equipment exclusively for upgrading or repairing existing technologies or equipment, whereas 28.6% had an equipment component directed to the establishment of centres or for the introduction of new technologies, reagents, radiopharmaceuticals, etc. The majority of projects had a knowledge sharing element (95.9%). In 57.1% of the projects some sort of information exchange and networking took place, and 28.6% had an awareness-raising element, either through technical studies and publications or through promotional materials and campaigns, whereas only 10.2% had a component that established a clear relationship between public and private sectors.

J. Sectoral analysis using the Agency's fields of activity

44. The sectoral analysis presented in this section uses the general classification assigned by the Department of Technical Cooperation to each project with the purpose of describing the areas towards which nuclear technology is being transferred, i.e. the Agency's fields of activity. For reference, Annex 4 presents a list of all the 69 projects used in this analysis sorted according to their specific and general fields of activity and separated by status; also Appendix 1 includes all the fields of activity used for TC projects.

45. This analysis captures the changes in the sectoral trends that occurred probably as a result of the introduction of certain variables such as the Technical Cooperation Strategy in 1997, the opening for signature of the Agreement in 1998 and the Agency's decision in 2003 of placing radiation protection projects outside the ARCAL framework.

46. This section starts by presenting in Table 5 the number of new projects initiated over time, including upgraded footnote-a/ projects. From 1983 to 1988, projects were approved on a yearly basis. As of 1989 two-year approvals started.

Table 5. Number of new projects initiated including upgraded footnote-a/ projects

Projects approved on an annual basis	1983	1
	1984	0
	1985	1
	1986	8
	1987	0
	1988	1
Projects approved by biennium	1989–1990	1
	1991–1992	7
	1993–1994	1
	1995–1996	5
	1997–1998	5
	1999–2000	18
	2001–2002	15
	2003–2004	6
Total projects	1983–2004	69

Source: TC-Pride

47. For the purpose of this analysis, in the following tables and figures the projects and core funds are grouped by biennium, with the exception of the first six years which are grouped into 3-year periods.

48. Table 6 and Figure 8 present the distribution of the Agency's approved core funds through time and by sector.

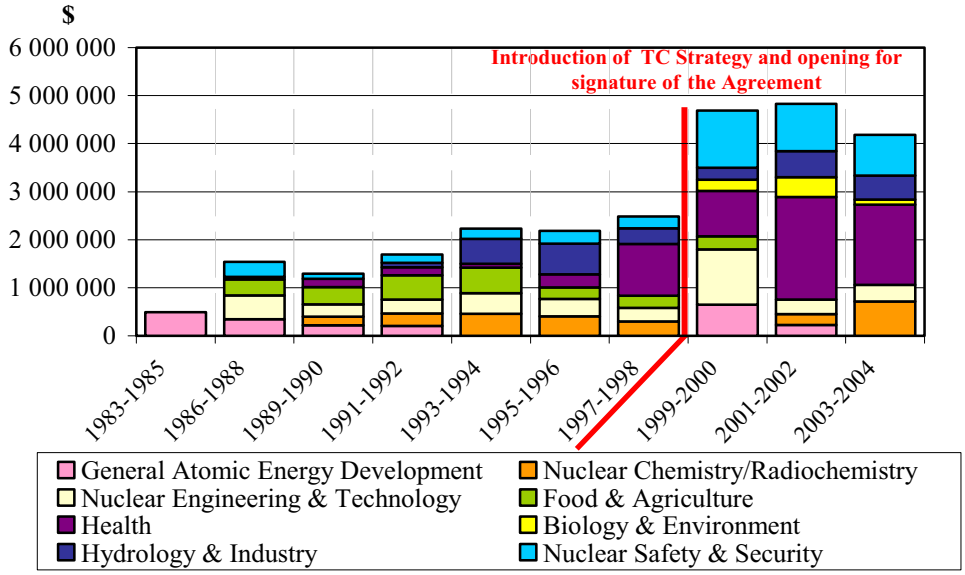
Table 6. Core funds[1] approved by sector

Sector[3] / Biennium[1]	Gral. Atomic Energy Dev.	Nuclear Radio-chemistry	Nuclear Engineering & Techn.	Food & Agriculture	Health	Biology & Environment	Hydrology & Industry	Safety & Security	**Total by Biennum**
1983-1985[2]	492 800	0	0	0	0	0	0	0	**492 800**
1986-1988[2]	347 200	0	489 100	338 800	51 600	0	0	313 800	**1 540 500**
1989-1990	218 500	181 400	256 000	358 700	169 500	0	0	109 500	**1 293 600**
1991-1992	204 450	259 900	290 750	505 500	161 300	0	97 200	174 450	**1 693 550**
1993-1994	0	460 200	426 200	528 800	85 700	0	514 550	213 100	**2 228 550**
1995-1996	0	404 600	358 000	241 800	275 100	0	636 000	271 500	**2 187 000**
1997-1998	0	302 100	276 500	252 300	1 078 250	0	329 190	245 000	**2 483 340**
1999-2000	646 250	0	1 149 100	274 900	945 100	233 700	244 700	1 195 750	**4 689 500**
2001-2002	224 700	230 300	300 600	0	2 135 210	415 040	535 000	985 980	**4 826 830**
2003-2004	0	712 400	348 620	0	1 667 800	105 050	500 740	845 250	**4 179 860**
Total by Sector[4]	**2 133 900**	**2 550 900**	**3 894 870**	**2 500 800**	**6 569 560**	**753 790**	**2 857 380**	**4 354 330**	**25 615 530**

1. *Core funds do not include extrabudgetary contributions. The approvals presented in this table are based on the revised annual approvals. Initially funds are approved based on an estimated budget for a two-year cycle. However, at the end of the first year the estimates are revised and the funds approved for the second year are adjusted accordingly. This table includes the adjusted approvals for each year grouped by biennium.*
2. *During these years projects were approved on an annual basis. For the purpose of this analysis they have been grouped in three-year cycles.*
3. *The names of the fields of activity are represented by key words. The full names can be found in Annex 3 or in Appendix 1.*
4. *The numbers in this table have been rounded.*

Sources: Based on official Agency data provided by TCPCS and TC-Pride.

Figure 8. Core funds approved by sector
(including funds approved for project extensions)



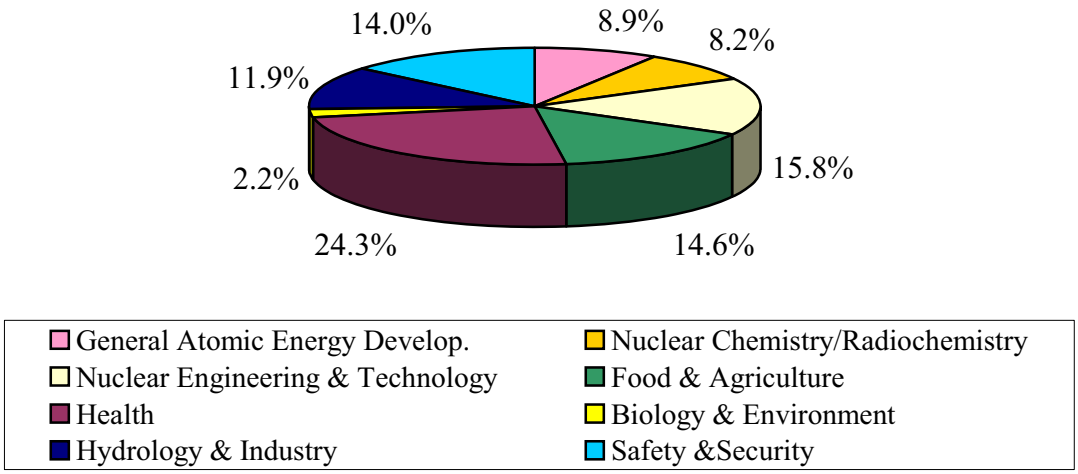
Sources: Based on official Agency data provided by TCPCS and TC-Pride.

49. The data show an increasing trend in the size of approved core funds. The sharpest increase is observed in the two cycles following the introduction of the Technical Cooperation Strategy and the opening for signature of the Agreement, from $2.5 million in 1997–1998 to $4.7 million in 1999–2000 and $4.8 million in 2001–2002. The approved funds were slightly less for 2003–2004 with $4.2 million.

50. With regard to the distribution of the approved funds by sector, the health sector had the highest amount of approved funds, peaking in 2001–2002 with $2.1 million. The next highest sectors were the safety and security sector with $1.2 million in 1999–2000, and the nuclear engineering and technology sector with $1.1 million in the same cycle.

51. Figure 9 presents the actual disbursements of all funds since 1983 by sector. For reference, Annex 5 presents the related project-specific data.

Figure 9. Disbursements of all funds by sector[1] (1983-2004)

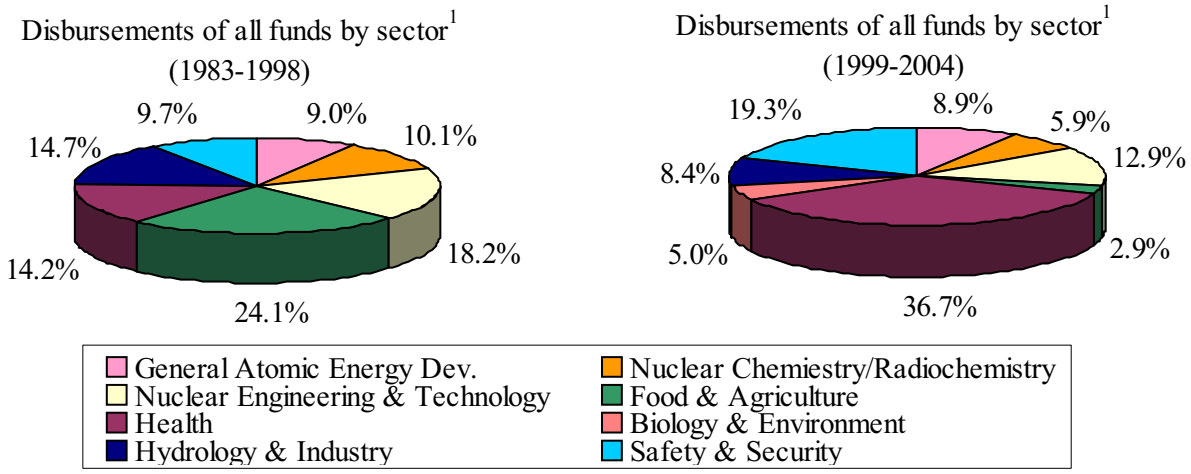


[1] *The data on disbursements include extrabudgetary contributions and upgraded footnote-a/ projects.*
Sources: Based on official Agency data provided by TCPCS and TC-Pride.

52. Since the inception of ARCAL, the highest disbursement of funds has gone to the health sector with a share of 24.3%, followed by nuclear engineering and technology with 15.8%, and food and agriculture with 14.6%. The nuclear safety and security sector accounted for 14.0%, followed by the hydrology and industry sector with 11.9%, and the sectors of general atomic energy development and nuclear radiochemistry with 8.9% and 8.2% respectively. Finally, the sector with the lowest disbursement was biology and environment with 2.2% of the funds.

53. In Figure 10, the data on the disbursements of funds are also separated into two periods of time, 1983–1998 and 1999–2004, to show whether there were any visible sectoral changes after the introduction of the Technical Cooperation Strategy and the opening for signature of the Agreement at the political level. As the aim of the Technical Cooperation Strategy was to increasingly promote tangible socio-economic impact, it would be expected that the funds were re-directed to the sectors of health, environment, hydrology and industry. For reference, Annex 5 presents the related project-specific data.

Figure. 10



[1] *The data on disbursements include extrabudgetary contributions and upgraded footnote-a/ projects.*
Sources: Based on official Agency data provided by TCPCS Section and TC-Pride.

54. The five main changes that can be observed are: 1) the steep decrease in the disbursement of funds in the food and agriculture sector from 24.1% in the period 1983–1998 to 2.9% for the period 1999–2004; 2) the steep increase of funds disbursed in the health sector, from 14.2% for 1983–1998 to 36.7% for 1999–2004; 3) the emergence of the environmental sector from having no participation in the first period to having a financial share of 5.0% in the second; 4) the increase of funds disbursed in the safety and security sector from 9.7% to 19.3%; and 5) the 43% drop in the amount disbursed for projects in the hydrology and industry sector, from 14.7% to 8.4%.

55. The specific years when the above-mentioned changes happened can be seen in Figure 11, which shows the evolution of projects for each individual sector.

56. For instance, in the food and agriculture sector the most drastic change happened during the period 1986–1990. There were four projects in this sector in the period 1986–1998, but none in the following cycle, and an average of less than one project in subsequent biennia. In the general atomic energy development sector, three projects were approved for 1999–2000 following thirteen years without any projects in that sector; the trend in the health sector projects also changed from an average of less than one project per biennium before 1999 to an average of four projects in the following cycles; the biology and environment sector was addressed for the first time in the 1999–2000 cycle.

57. The number of approved projects in the nuclear safety and security sector increased from one project during 1997–1998 to five projects during 1999–2000 (the biennium following the introduction of the Technical Cooperation Strategy and opening for signature of the Agreement); however in the 2003–2004 cycle, only two projects were approved in this sector. This reflects the Agency's decision to implement all radiation protection projects in Latin America under the framework of the regular regional projects.

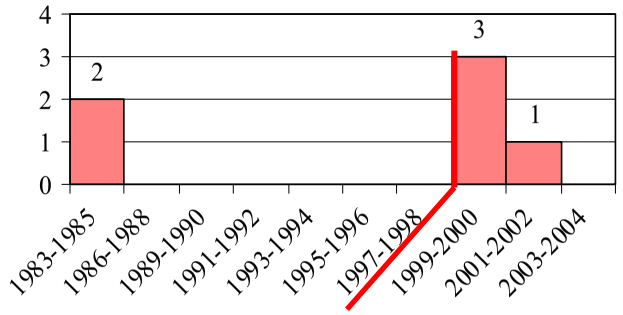
58. Figure 11 also depicts how, during 1983–1985, the programme started with only two projects in one sector (general atomic energy development) moving to ten projects in six different sectors in the next three years. Only one new project was initiated in each of the 1989–1990 (hydrology and industry sector) and 1993–1994 (safety and security sector) biennia. The biennium with the largest number of new projects was 1999–2000, with 18 projects from all sectors except for nuclear chemistry and radiochemistry, followed by the 2001–2002 biennium with 15 new projects from all sectors except food and agriculture. In comparison to the previous two cycles, the number of projects approved for the last biennium, 2003–2004, was relatively low with six new projects. For reference, Annex 5 presents the related project-specific data.

Figure 11. Sectoral analysis of new ARCAL projects through time including upgraded footnote-a projects (based on year of approval)

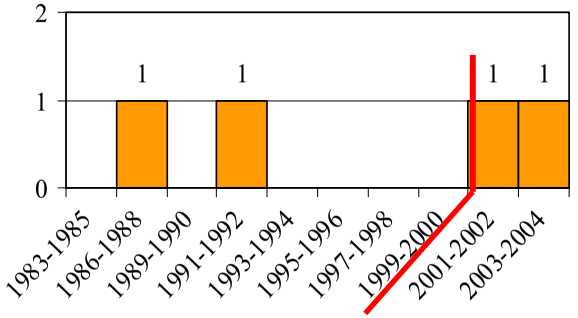
Source: TC-Pride

(Introduction of the TC Strategy and opening for signature of the Agreement)

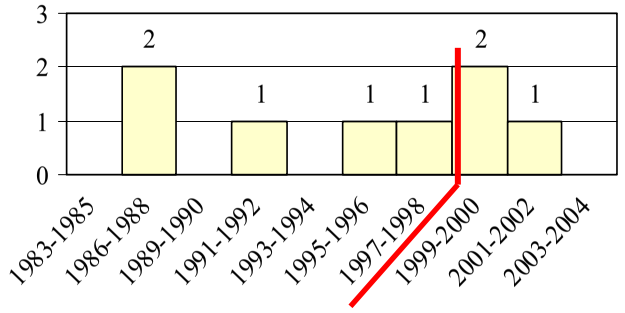
Number of new approved projects in the sector of **general atomic energy development**



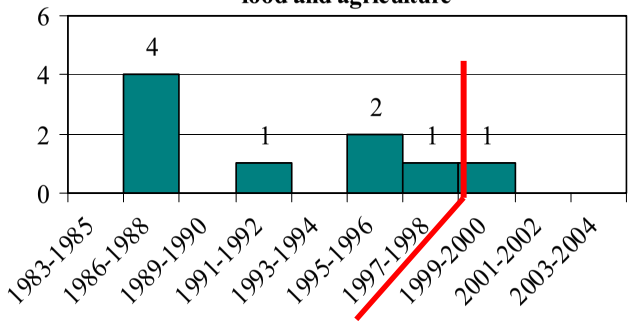
Number of new approved projects in the sector of **nuclear chemistry/ radiochemistry**



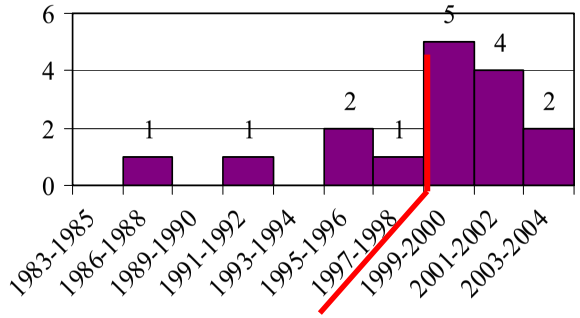
Number of new approved projects in the sector of **nuclear engineering and technology**



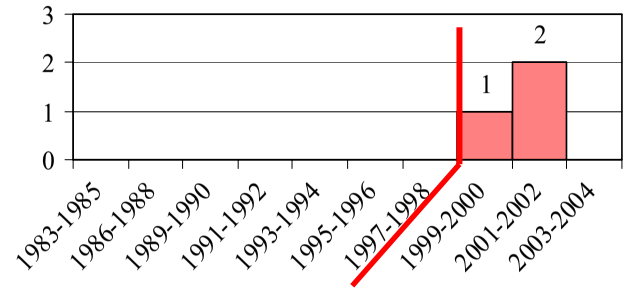
Number of new approved projects in the sector of **food and agriculture**



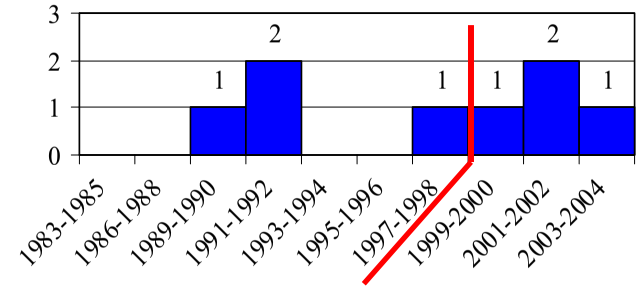
Number of new approved projects in the sector of **health**



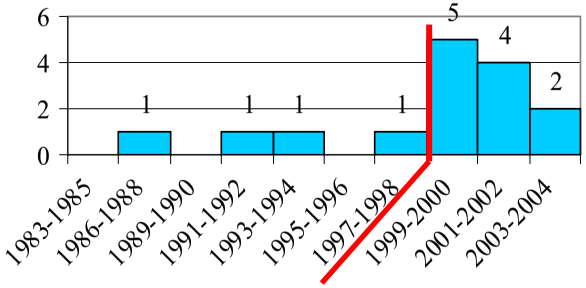
Number of new approved projects in the sector of **biology and environment**



Number of new approved projects in the sector of **hydrology and industry**



Number of new approved projects in the sector of **nuclear safety and security**



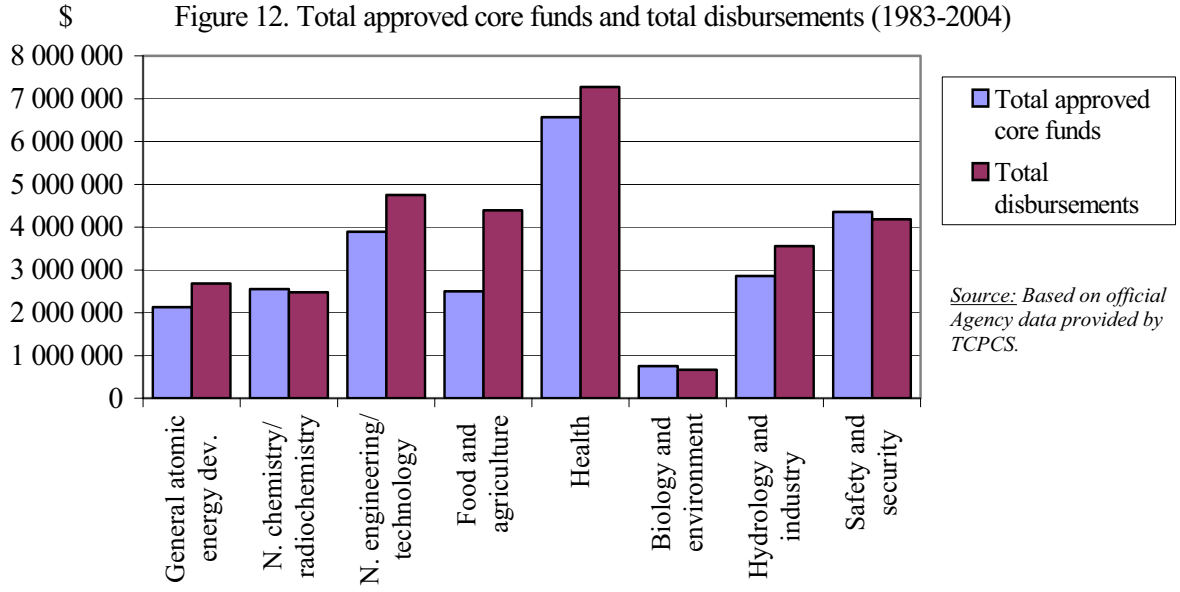
59. Table 7 and Figure 12 compare the total core funds approved by sector ($25.6 million) with the total disbursements made in the same period of time ($30.0 million). The difference between the figures reflects the TC extrabudgetary contributions of $3.8 million (described in Table 2) and all budget revisions and rephasings made during the period. For reference, Annex 5 presents the related project-specific data.

Table 7. Total approved core funds and disbursements during 1983–2004

Field of activity[4]	Total core funds approved[1]	Total disbursements[2]
General atomic energy development	2 133 900	2 681 623
Nuclear radiochemistry	2 550 900	2 471 431
Nuclear engineering and technology	3 894 870	4 748 273
Food and agriculture	2 500 800	4 387 126
Health	6 569 560	7 268 655
Biology and environment	753 790	668 418
Hydrology and industry	2 857 380	3 559 290
Safety and security	4 354 330	4 186 313
Total[3]	**25 615 530**	**29 971 128**

[1] Core funds do not include extrabudgetary contributions.
[2] Disbursements include extrabudgetary contributions.
[3] The numbers in this table have been rounded.
[4] The names of the fields of activity are represented by key words. The full name can be found in Annex 3 or in Appendix
Source: Based on official Agency data provided by TCPCS.

Figure 12. Total approved core funds and total disbursements (1983-2004)



Source: Based on official Agency data provided by TCPCS.

60. Figure 13 presents the sectoral participation of ARCAL participating countries, on the basis of their involvement in the ARCAL projects. These sectoral data can be observed in increasing detail in , Annex 3 “Participation of each country in ARCAL projects” Annex 1 “Detailed list of all ARCAL projects” and Annex 4 “Total number of ARCAL projects by field of activity”.

Figure 13. Sectoral Participation of ARCAL Participating Countries

(As reflected by the participation of countries in the ARCAL projects corresponding to each TC Field of Activity (1983-2004)

	Prioritary Sectors ←							Sectors with Less Priority
ARG	(9) Safety and Security 19.6%	(5) Food and Agriculture 19.6%	**(6) Health 17.4%**	(4) Nuclear Technology 15.2%	**(8) Hydrology and Industry 10.9%**	(0) Gral Atomic Energy Dev. 10.9%	(2) Nuclear Radiochemistry 4.3%	(7) Biology and Environment 2.2%
BOL	**(6) Health 33.3%**	(4) Nuclear Technology 20.8%	(5) Food and Agriculture 20.8%	(9) Safety and Security 16.7%	(0) Gral Atomic Energy Dev. 8.3%	(8) Hydrology and Industry 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
BRA	(9) Safety and Security 22.9%	**(6) Health 18.8%**	(5) Food and Agriculture 18.8%	(4) Nuclear Technology 14.6%	(0) Gral Atomic Energy Dev. 10.4%	**(8) Hydrology and Industry 8.3%**	(2) Nuclear Radiochemistry 4.2%	(7) Biology and Environment 2.1%
CHI	(9) Safety and Security 20.5%	(5) Food and Agriculture 20.5%	**(6) Health 18.2%**	(4) Nuclear Technology 11.4%	**(8) Hydrology and Industry 11.4%**	(0) Gral Atomic Energy Dev. 11.4%	(2) Nuclear Radiochemistry 4.5%	(7) Biology and Environment 2.3%
COL	**(6) Health 23.3%**	(4) Nuclear Technology 20.0%	(9) Safety and Security 20.0%	(5) Food and Agriculture 16.7%	(0) Gral Atomic Energy Dev. 10.0%	**(8) Hydrology and Industry 6.7%**	(2) Nuclear Radiochemistry 3.3%	(7) Biology and Environment 0.0%
COS	**(6) Health 23.3%**	(4) Nuclear Technology 20.0%	**(8) Hydrology and Industry 16.7%**	(5) Food and Agriculture 13.3%	(9) Safety and Security 10.0%	(0) Gral Atomic Energy Dev. 10.0%	(2) Nuclear Radiochemistry 6.7%	(7) Biology and Environment 0.0%
CUB	**(6) Health 17.6%**	(4) Nuclear Technology 17.6%	(9) Safety and Security 17.6%	(5) Food and Agriculture 14.7%	**(8) Hydrology and Industry 14.7%**	(0) Gral Atomic Energy Dev. 11.8%	(2) Nuclear Radiochemistry 5.9%	(7) Biology and Environment 0.0%
DOM	**(6) Health 25.0%**	(4) Nuclear Technology 25.0%	(9) Safety and Security 25.0%	**(8) Hydrology and Industry 12.5%**	(0) Gral Atomic Energy Dev. 12.5%	(5) Food and Agriculture 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
ECU	**(6) Health 20.7%**	(4) Nuclear Technology 20.7%	(5) Food and Agriculture 17.2%	(9) Safety and Security 13.8%	**(8) Hydrology and Industry 13.8%**	(0) Gral Atomic Energy Dev. 10.3%	(2) Nuclear Radiochemistry 3.4%	(7) Biology and Environment 0.0%
ELS	(4) Nuclear Technology 42.9%	**(6) Health 28.6%**	(9) Safety and Security 14.3%	(0) Gral Atomic Energy Dev. 14.3%	(5) Food and Agriculture 0.0%	(8) Hydrology and Industry 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
GUA	**(6) Health 23.3%**	(5) Food and Agriculture 23.3%	(4) Nuclear Technology 13.3%	(9) Safety and Security 13.3%	**(8) Hydrology and Industry 13.3%**	(0) Gral Atomic Energy Dev. 6.7%	(2) Nuclear Radiochemistry 6.7%	(7) Biology and Environment 0.0%
HAI	(0) Gral Atomic Energy Dev. 100.0%	(6) Health 0.0%	(4) Nuclear Technology 0.0%	(9) Safety and Security 0.0%	(5) Food and Agriculture 0.0%	(8) Hydrology and Industry 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
JAM	(4) Nuclear Technology 66.7%	(0) Gral Atomic Energy Dev. 33.3%	(6) Health 0.0%	(9) Safety and Security 0.0%	(5) Food and Agriculture 0.0%	(8) Hydrology and Industry 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
MEX	**(6) Health 17.9%**	(4) Nuclear Technology 17.9%	(9) Safety and Security 17.9%	(5) Food and Agriculture 12.8%	**(8) Hydrology and Industry 12.8%**	(0) Gral Atomic Energy Dev. 12.8%	(2) Nuclear Radiochemistry 5.1%	(7) Biology and Environment 2.6%
NIC	**(6) Health 30.0%**	(4) Nuclear Technology 30.0%	(0) Gral Atomic Energy Dev. 20.0%	(5) Food and Agriculture 10.0%	**(8) Hydrology and Industry 10.0%**	(9) Safety and Security 0.0%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
PAN	**(8) Hydrology and Industry 33.3%**	**(6) Health 26.7%**	(4) Nuclear Technology 13.3%	(9) Safety and Security 13.3%	(5) Food and Agriculture 6.7%	(0) Gral Atomic Energy Dev. 6.7%	(2) Nuclear Radiochemistry 0.0%	(7) Biology and Environment 0.0%
PAR	(5) Food and Agriculture 24.0%	**(6) Health 20.0%**	(9) Safety and Security 16.0%	(0) Gral Atomic Energy Dev. 16.0%	(4) Nuclear Technology 12.0%	(2) Nuclear Radiochemistry 8.0%	**(8) Hydrology and Industry 4.0%**	(7) Biology and Environment 0.0%
PER	**(6) Health 23.5%**	(9) Safety and Security 20.6%	(5) Food and Agriculture 17.6%	(4) Nuclear Technology 14.7%	**(8) Hydrology and Industry 8.8%**	(0) Gral Atomic Energy Dev. 8.8%	(2) Nuclear Radiochemistry 5.9%	(7) Biology and Environment 0.0%
URU	**(6) Health 19.4%**	(9) Safety and Security 19.4%	(4) Nuclear Technology 16.1%	(5) Food and Agriculture 12.9%	**(8) Hydrology and Industry 12.9%**	(0) Gral Atomic Energy Dev. 12.9%	(2) Nuclear Radiochemistry 6.5%	(7) Biology and Environment 0.0%
VEN	(4) Nuclear Technology 20.8%	**(8) Hydrology and Industry 20.8%**	**(6) Health 16.7%**	(9) Safety and Security 12.5%	(5) Food and Agriculture 12.5%	(0) Gral Atomic Energy Dev. 12.5%	(2) Nuclear Radiochemistry 4.2%	(7) Biology and Environment 0.0%
ALL COUNTRIES	**(6) Health 20.9%**	(4) Nuclear Technology 17.4%	(9) Safety and Security 17.0%	(5) Food and Agriculture 16.4%	**(8) Hydrology and Industry 11.5%**	(0) Gral Atomic Energy Dev. 11.4%	(2) Nuclear Radiochemistry 4.5%	(7) Biology and Environment 0.8%

Sources: Constructed using TC-Pride, official Agency data provided by TCPCS and data from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL participating countries.

K. Concrete achievements of TCDC in ARCAL

61. ARCAL's TCDC achievements have been registered in several sources, such as reports from final coordinators' meetings, reports from Phase I, II and III of ARCAL, the report on "Outputs and impact of 20 years of ARCAL projects", the ARCAL website, as well as the ARCAL/IAEA promotional video produced under project RLA/0/018 in 2001.

62. Specifically, the following results were identified from the implementation of the 49 ARCAL projects completed during the period 1983–2004:

- ARCAL has facilitated the transfer of nuclear technology from the most nuclear developed countries to the least developed ones, mainly in the fields of health, agriculture, nuclear technology, hydrology and industry, and nuclear safety and security;

- ARCAL has generated savings to the Agency's technical cooperation programme of approximately $1.6 million[10] in the past 20 years as a result of the ARCAL policy of not paying honorary fees to the experts of the region;

- The Board of ARCAL Representatives has recognized 35 ARCAL designated centres based on their record of quality services. The services are provided in different nuclear-related areas to countries in the region and sometimes to countries of other regions;

- ARCAL has contributed to the strengthening of relationships and exchange of information between nuclear institutions of the region through five laboratory inter-comparisons and through the establishment of information networks and databases in Agency-related technical fields, such as the Regional Network for Information in the Nuclear Area (see http://www.cnea.gov.ar/rrian/)

- ARCAL has harmonized several norms, protocols and procedures in the use of nuclear techniques, following international standards for the adoption of best practices in the region in areas such as health, agriculture, industry, and safety and security. Specifically, the following have been made available to the region (some in Spanish only):

    - 14 manuals: e.g. Radiation Protection Inspectors Manual (RLA/9/028), Manual of Assistance to Persons Exposed to Radiation (RLA/9/031), Manual for the Implementation of a Radiation Protection and Quality Control Programme for Radiodiagnosis in Hospitals (RLA/9/035).

    - 21 guides: e.g. Industrial Applications of Radiotracers and Sealed Radiation Sources (RLA/8/024), Design and Utilization of Nucleonic Control Systems (RLA/8/024), Regulatory Guide for the Safe Use of Nuclear Medicine (RLA/9/028), Auditors' Guide (RLA/9/032).

    - 29 technical reports and documents: e.g. Repair, Maintenance and Verification of Equipment (RLA/4/015), Multilocation Yield Trials of Rice Mutants (RLA/5/035), Harmonized Programme for Quality Assurance in Radiopharmacy (RLA/6/038), Safety and Research Reactors: Interim Aging Studies (RLA/9/033).

[10] Figure estimated using official Agency records.

- 19 documents of norms and procedures: e.g. SPECT Protocols for Nuclear Medical Applications (RLA6/036), Norms and Procedures for Tracer Technologies (RLA/8/024), Implementation of the ICRP-60 Recommendations and of the Basic Norms of Safety (RLA/9/016), Research Reactor Aging Management Methodology (RLA/9/046).

- 20 protocols, codes and standards: e.g. Quality Protocols for Radiopharmaceuticals (RLA/2/007), Research Protocol for Irradiation as Quarantine Treatment (RLA/5/043), Protocol for Post-operational Breast Cancer Treatment by Irradiation (RLA/6/029), Quality Control Protocols in Radiodiagnosis (RLA/9/035).

- 12 evaluations: e.g. Evaluation of the Spare Parts Service (RLA/4/006), Evaluation of the Phantom Prototype (RLA/6/036), Evaluation of Radiation Protection Laws and Regulations in Latin America (RLA/9/009).

- 2 bibliographic compilations: e.g. Accidents and Incidents in the Nuclear Area that have Occurred in Latin American and the Caribbean (RLA/0/017), Nuclear Legislation in Latin America and the Caribbean (RLA/0/017).

- 8 technical studies: e.g. Investigations of the Environmental, Chemical and Hydrochemical Isotopes of the Rio Guacalate in Guatemala (RLA/8/014), Contamination and Recharge of Aquifers with Emphasis on Tempisque Lake in Costa Rica (RLA/8/014), Study of Regulatory Criteria (RLA/9/016).

- 2 books: Increase in the Biological Fixation of Nitrogen in the Common Bean in Latin America (RLA/5/036), Radiation Protection in Latin America and the Caribbean Vol. 1 and Vol. 2 (RLA/9/016).

- 5 training material packages: e.g. Training material for courses in maintenance, repair and operation of nuclear instruments for industrial use (RLA/4/011), presentations made at the regional seminar on the environmental application of isotopes and radiation (RLA/8/016), Programme for Modular Training in Radiopathology and on Methodological Aspects of a Programme Preparing for Radiological Accidents (RLA/9/031).

  Annex 6 identifies in which of the projects these documents were produced. This information can be used as a guideline to search for specific outputs in the report on "Outputs and impact of 20 years of ARCAL projects".

- ARCAL has promoted the peaceful uses of nuclear science and technology for the solution of priority problems in the region through the establishment of the ARCAL website (http://arc.cnea.gov.ar/) and through the elaboration and dissemination of diverse promotional material, publications, bulletins, brochures and videos.

Annex 1. Detailed List of all ARCAL Projects Initiated during 1983–2004

List of ARCAL Projects Completed by 2004			Start Date	End Date	Planned Duration (years)	Actual Duration (years)
1	RLA/0/006	Nuclear Science and Technology Development (ARCAL)	1983	1992	7	9
2	RLA/0/009	Nuclear Information (ARCAL X)	1985	1993	5	8
3	RLA/0/017	Reg. Information Network in the Nuclear Field (ARCAL XLII)	1999	2002	2	3
4	RLA/0/018	Project Formulation Meetings (ARCAL XLV)	1999	2003	2	4
5	RLA/0/019	Regional Centre for IAEA Nuclear Data Services (ARCAL XLVI)	1999	2000	1	1
6	RLA/2/003	Nuclear Analytical Techniques (ARCAL IV)	1986	1998	10	12
7	RLA/2/007	Production and Control of Radiopharmaceuticals (ARCAL XV)	1991	2000	5	9
8	RLA/4/006	Nuclear Instrumentation (ARCAL II)	1986	1992	4	6
9	RLA/4/007	Research Reactor Utilization (ARCAL V) -*Upgraded footnote-a*	1986	1992	5	6
10	RLA/4/008	Nuclear Instrumentation - Phase II (ARCAL II)	1991	1996	5	5
11	RLA/4/011	Nuclear Instrumentation Maintenance (ARCAL XIX)	1995	1999	3	4
12	RLA/4/013	Quality Assurance in Analytical Laboratories (ARCAL XXVI)	1997	2003	2	6
13	RLA/4/014	Calib. of Radiotherapy Dosim. Instrumentation (ARCAL XXXIV)	1999	2003	2	4
14	RLA/4/015	Training and Repair of Nuclear Instrumentation (ARCAL XXXV)	1999	2003	2	4
15	RLA/5/019	Radioimmunoassay in Animal Reproduction (ARCAL III)	1986	1992	5	6
16	RLA/5/020	Food Irradiation (ARCAL Vi) -*Upgraded footnote-a*	1986	1992	5	6
17	RLA/5/021	Improvement of Cereals Through Mutation Breeding (ARCAL VII)	1986	1996	5	10
18	RLA/5/023	Nuclear Techniques in Agriculture (ARCAL XI) -*Upgraded footnote-a*	1988	1993	2	5
19	RLA/5/028	Immunoassay in Animal Production and Health (ARCAL III)	1991	1997	5	6
20	RLA/5/035	Evaluation of Cereal Crop Mutants (ARCAL XXIA) -*Upgraded footnote-a*	1995	2003	5	8
21	RLA/5/036	Plant Nutrition and Soil-Water Management (ARCAL XXII)	1995	2003	3	8
22	RLA/5/040	Development of Commercial Food Irradiation (ARCAL XXIX) *–Upgraded F-a*	1997	1998	1	1
23	RLA/5/043	Harmonized Quarantine Regula. for Fruit Irrad. (ARCAL XXXIII)	1999	2003	2	4
24	RLA/6/011	Radioimmunoassay of Thyroid-Related Hormones (ARCAL Viii)	1986	1992	5	6
25	RLA/6/016	Production of Radioimmunoassay Reagents (ARCAL Viii)	1991	1997	4	6
26	RLA/6/027	Upgrading Nuclear Medicine Practices (ARCAL XXIII)	1995	2000	4	5
27	RLA/6/029	Improvement of Quality of Radiotherapy Practice (ARCAL XXIV)	1995	2000	3	5
28	RLA/6/036	QC & Optimization of SPECT Clinical Protocols (ARCAL XXXII)	1999	2003	2	4
29	RLA/6/037	Standarization of Nuclear Nephrology Techniques (ARCAL XXXVI)	1999	2003	2	4
30	RLA/6/038	Harmoniz. of Standards for QA in Radiopharm. (ARCAL XXXVIII)	1999	2004	2	5
31	RLA/6/039	Screening and Diagnosis of Hepatitis C (ARCAL Xl)	1999	2003	2	4
32	RLA/6/044	Application of Mol. Biology for Diagnosis of Infect. Diseases (ARCAL LVI)	2001	2004	2	3
33	RLA/7/007	Determining Content of Atmospheric Contamin. (ARCAL XXXIX)	1999	2003	2	4
34	RLA/8/014	Application of Isotope Techniques in Hydrology (ARCAL XIII)	1989	1994	5	5
35	RLA/8/016	Industrial Applications of Nuclear Technology (ARCAL XVI)	1991	1998	5	7
36	RLA/8/018	Tracer Techniques in Dam Leakage (ARCAL XVIII)	1991	1998	3	7
37	RLA/8/023	Aquifer Characterization for Sustainable Mgmnt. (ARCAL XXXI)	1997	2003	2	6
38	RLA/8/024	Industrial Applic. of Tracer Technology & NCs (ARCAL XLIII)	1999	2003	2	4
39	RLA/9/009	Radiation Protection (ARCAL I)	1986	1993	5	7
40	RLA/9/011	Radiation Protection - Phase II (ARCAL I)	1991	1996	3	5
41	RLA/9/016	Radiation Protection Legal Framework (ARCAL XVII)	1993	1998	3	5
42	RLA/9/028	Guidelines on Control of Radiation Sources (ARCAL XX)	1997	2004	3	7
43	RLA/9/031	Medical Treatment in Radiological Accidents (ARCAL XXXVII)	1999	2003	2	4
44	RLA/9/032	Quality Assurance of Radiation Protection Service Laboratories (ARCAL XLI)	1999	2004	3	5
45	RLA/9/033	Safety of Research Reactors (ARCAL XLIV)	1999	2003	2	4
46	RLA/9/034	Physical Prot. of Nucl. Materials & Install. (ARCAL KLVIII)	1999	2003	2	4
47	RLA/9/035	International Basic Safety Standards in Medical Practices (ARCAL XLIX)	1999	2004	2	5
48	RLA/9/043	Improving the Effectiveness of Regulatory Management (ARCAL LXVI)	2001	2004	2	3
49	RLA/9/046	Improving Safety in Research Reactors (ARCAL LXVIII)	2001	2004	2	3

List of ARCAL Projects that were still Ongoing in 2005			Start Date
1	RLA/0/022	Project Formulation Meetings and Promotion of TCDC (ARCAL LI)	2001
2	RLA/2/010	Preparation, QC, and Validation of Radiopharmaceuticals Based on Monoclonal Antibodies (ARCAL LII)	2001
3	RLA/2/011	Sust. of Quality Syst. in Labs Using Nuclear Analytical & Complement. Techniques (ARCAL LXXVI)	2003
4	RLA/4/017	Quality Control in the Repair and Maintenance of Nuclear Medical Instruments (ARCAL LIII)	2001
5	RLA/6/032	Improved Quality Assurance in Clinical Dosimetry for Radiation Therapy (ARCAL XXX)	1997
6	RLA/6/041	Strengthening the Master of Medical Physics Degree (ARCAL L)	1999
7	RLA/6/042	Early Diagnosis of Helicobacter Pilory Infection Through the Use of Nuclear Techniques (ARCAL LIV)	2001
8	RLA/6/043	QA/QC in Mammography Studies (ARCAL LV)	2001
9	RLA/6/046	Improved Quality Assurance in Radiation Therapy (ARCAL LVIII)	2001
10	RLA/6/048	Development of a Regional Telemedicine Network (ARCAL LXXIII)	2003
11	RLA/6/049	Improvement of the Radiation Treatment of Uterine Cervix Cancer (ARCAL LXXIV)	2003
12	RLA/7/009	Quality System for the Production of Irradiated Sterilized Grafts (ARCAL LIX)	2001
13	RLA/7/010	Application of Biomonitors, Nuclear, Related Techniques in Atmospheric Pollution Studies (ARCAL LX)	2001
14	RLA/8/028	Transfer of TT and NCS to Industrial Sectors of Economic Interest (ARCAL LXI)	2001
15	RLA/8/030	Harmoniz. & Optimiz. of Managerial & Operational Procedures in Industrial Rad. Facilities (ARCAL LXIII)	2001
16	RLA/8/037	Exploring Moderate & Low-temperature Geothermal Reserves/ Identify Applications (ARCAL LXXVII)	2003
17	RLA/9/042	Regulatory Harmonization and QA Programmes for the Safe Transport of Nuclear Materials (ARCAL LXV)	2001
18	RLA/9/045	Strength. & Harmoniz. National Capabilities for Responding to Rad. Emergencies (ARCAL LXVII)	2001
19	RLA/9/048	Determination of Guidance Levels for Conventional and Interventional Radiology (ARCAL LXXV)	2003
20	RLA/9/049	Harmonization of Internal Dosimetry Procedures (ARCAL LXXVIII)	2003

Source: TC-Pride

Annex 2: TCF and Extrabudgetary Contributions Disbursed during 1983–2004 ($)

PROJ. NUM.	CAN	CHI	COL	ECU	EU	FRA	GER	SWE	USA	**TOTAL EXTRA BUDG.**	TCF	TC RESERVE	TCF (NCC)	**TOTAL TCF**	**TOTAL**
RLA/0/006							44 987			44 987	764 092			764 092	**809 079**
RLA/0/009										0	678 059			678 059	**678 059**
RLA/0/017										0	307 139			307 139	**307 139**
RLA/0/018		33 628								33 628	244 039			244 039	**277 666**
RLA/0/019										0	77 481			77 481	**77 481**
RLA/0/022		31 129		2 451						33 580	498 618			498 618	**532 198**
RLA/2/003		22 000					52 252			74 252	928 355			928 355	**1 002 607**
RLA/2/007		15 950	9 985							25 935	761 030			761 030	**786 965**
RLA/2/010										0	373 024			373 024	**373 024**
RLA/2/011		4 698								4 698	304 138			304 138	**308 836**
RLA/4/006							168 922		160 266	329 188	874 050		6 145	880 195	**1 209 383**
RLA/4/007		9 200					273 619			282 819	72 217			72 217	**355 036**
RLA/4/008		4 000	6 000				112 739			122 739	669 437			669 437	**792 176**
RLA/4/011		11 066								11 066	492 847			492 847	**503 914**
RLA/4/013							18 954			18 954	471 343			471 343	**490 297**
RLA/4/014										0	243 794			243 794	**243 794**
RLA/4/015										0	596 594			596 594	**596 594**
RLA/4/017										0	557 080			557 080	**557 080**
RLA/5/019								60 000		60 000	804 160			804 160	**864 160**
RLA/5/020	18 621	8 916								27 538	22 440		80	22 520	**50 057**
RLA/5/021									584 981	584 981	252 694			252 694	**837 675**
RLA/5/023										0	109 554			109 554	**109 554**
RLA/5/028								168 600		168 600	1 360 306			1 360 306	**1 528 906**
RLA/5/035									188 646	188 646	167 608			167 608	**356 254**
RLA/5/036										0	548 733			548 733	**548 733**
RLA/5/040		4 978				6 160				11 138	26 222			26 222	**37 360**
RLA5/0/43						0				0	54 427			54 427	**54 427**
RLA/6/011					348 781					348 781	254 900	19 646	15 608	290 154	**638 935**
RLA/6/016										0	305 712			305 712	**305 712**
RLA/6/027										0	718 863			718 863	**718 863**
RLA/6/029										0	707 620			707 620	**707 620**
RLA/6/032									40 000	40 000	891 562			891 562	**931 562**
RLA/6/036										0	203 720			203 720	**203 720**
RLA/6/037										0	142 644			142 644	**142 644**
RLA/6/038										0	106 533			106 533	**106 533**
RLA/6/039										0	193 517			193 517	**193 517**
RLA/6/041										0	934 896			934 896	**934 896**
RLA/6/042										0	362 142			362 142	**362 142**
RLA/6/043										0	434 765			434 765	**434 765**
RLA/6/044										0	263 220			263 220	**263 220**
RLA/6/046										0	716 832			716 832	**716 832**
RLA/6/048										0	289 392			289 392	**289 392**
RLA/6/049										0	318 301			318 301	**318 301**
RLA/7/007										0	215 029			215 029	**215 029**
RLA/7/009										0	264 537			264 537	**264 537**
RLA/7/010										0	188 852			188 852	**188 852**
RLA/8/014		6 000					561 038			567 038	232 118			232 118	**799 157**
RLA/8/016		5 040				368 232				373 272	749 873			749 873	**1 123 144**
RLA/8/018										0	316 558			316 558	**316 558**
RLA/8/023										0	340 232			340 232	**340 232**
RLA/8/024						25 840				25 840	240 783			240 783	**266 623**
RLA/8/028						137 057				137 057	411 670			411 670	**548 727**
RLA/8/030										0	134 543			134 543	**134 543**
RLA/8/037										0	30 307			30 307	**30 307**
RLA/9/009						79 697	89 521			169 218	493 729		21 219	514 948	**684 166**
RLA/9/011		4 000	2 820			123 640				130 460	374 190			374 190	**504 650**
RLA/9/016										0	270 289			270 289	**270 289**
RLA/9/028										0	513 658			513 658	**513 658**
RLA/9/031										0	228 864			228 864	**228 864**
RLA/9/032										0	222 856			222 856	**222 856**
RLA/9/033										0	167 649			167 649	**167 649**
RLA/9/034										0	48 298			48 298	**48 298**
RLA/9/035										0	535 343			535 343	**535 343**
RLA/9/042										0	75 452			75 452	**75 452**
RLA/9/043										0	284 365			284 365	**284 365**
RLA/9/045										0	305 216			305 216	**305 216**
RLA/9/046										0	149 103			149 103	**149 103**
RLA/9/048										0	44 377			44 377	**44 377**
RLA/9/049										0	152 027			152 027	**152 027**
TOTAL	**18 621**	**160 605**	**18 805**	**2 451**	**348 781**	**740 624**	**1 322 033**	**228 600**	**973 893**	**3 814 413**	**26 094 017**	**19 646**	**43 052**	**26 156 714**	**29 971 128**

Source: Official Agency data provided by TCPCS

Annex 3. Participation of each Country in ARCAL Projects during 1983-2004 (Only completed projects)

Project Number	ARG	BOL	BRA	CHI	COL	COS	CUB	DOM	ECU	ELS	GUA	HAI	JAM	MEX	NIC	PAN	PAR	PER	URU	VEN	Total number of countries
RLA/0/006	●		●	●		●	●				●			●			●		●	●	10
RLA/0/009	●		●	●	●	●			●		●			●			●	●	●		11
RLA/0/017	●	●	●	●	●	●	●		●					●	●		●	●	●	●	14
RLA/0/018	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	18
RLA/0/019	●		●	●			●							●							5
RLA/2/003	●		●	●		●	●		●		●			●			●	●	●		11
RLA/2/007	●		●	●	●	●	●				●			●			●	●	●	●	12
RLA/4/006	●	●	●	●	●	●	●		●		●		●	●							11
RLA/4/007	●		●		●	●			●					●			●	●	●	●	10
RLA/4/008	●	●	●	●	●	●	●		●		●		●	●							11
RLA/4/011	●	●	●	●	●	●	●		●	●				●	●	●	●	●	●	●	16
RLA/4/013	●	●	●	●	●		●	●	●					●				●	●	●	12
RLA/4/014	●		●			●	●			●	●			●	●			●	●	●	11
RLA/4/015	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	18
RLA/5/019	●	●	●	●	●	●			●		●			●			●	●			11
RLA/5/020	●	●	●	●	●				●		●						●	●			9
RLA/5/021	●	●	●	●	●	●			●		●						●	●			10
RLA/5/023	●	●	●	●	●	●	●		●		●			●	●	●	●	●	●	●	16
RLA/5/028	●	●	●	●	●		●		●		●						●	●			10
RLA/5/035	●		●	●		●	●				●			●					●		8
RLA/5/036	●		●	●			●				●			●					●	●	8
RLA/5/040	●		●	●													●		●		5
RLA5/0/43	●		●	●			●							●				●		●	7
RLA/6/011	●	●	●	●	●	●			●		●						●	●			10
RLA/6/016	●	●	●	●	●	●	●		●		●			●		●					11
RLA/6/027	●	●	●	●	●		●		●		●			●	●	●	●	●	●	●	15
RLA/6/029	●		●	●	●	●	●	●			●			●	●	●	●	●	●	●	15
RLA/6/036	●	●	●	●	●	●	●	●	●	●	●			●		●	●	●	●	●	17
RLA/6/037	●	●	●	●	●				●					●				●	●		9
RLA/6/038	●	●	●	●	●	●	●		●		●			●			●	●	●	●	14
RLA/6/039		●	●			●				●	●				●			●			7
RLA/6/044	●	●	●	●		●	●							●				●	●		9
RLA/7/007	●		●	●										●							4
RLA/8/014	●		●	●		●	●				●			●		●			●	●	10
RLA/8/016	●		●	●	●	●	●		●		●			●		●	●	●	●	●	14
RLA/8/018	●			●		●	●	●	●		●			●		●		●	●	●	12
RLA/8/023	●		●	●		●	●		●					●	●	●		●		●	11
RLA/8/024	●		●	●	●	●	●		●		●			●		●			●	●	12
RLA/9/009	●	●	●	●	●	●			●		●						●				9
RLA/9/011	●	●	●	●	●	●			●		●			●			●		●		11
RLA/9/016	●	●	●	●	●	●	●	●	●		●			●		●	●	●	●	●	16
RLA/9/028	●		●	●	●		●		●					●				●	●	●	10
RLA/9/031	●		●	●			●														4
RLA/9/032		●	●				●	●		●	●					●	●	●	●		10
RLA/9/033	●		●	●										●				●			5
RLA/9/034	●		●		●														●		4
RLA/9/035			●	●	●		●							●				●			6
RLA/9/043	●		●	●			●							●				●	●	●	8
RLA/9/046	●		●	●										●				●			5
Total number of projects	**46**	**24**	**48**	**44**	**30**	**30**	**34**	**8**	**29**	**7**	**30**	**1**	**3**	**39**	**10**	**15**	**25**	**34**	**31**	**24**	

Source: Constructed using data from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL .participating countries.

Annex 4: Total Number of ARCAL Projects by Field of Activity[1] (Status Dec. 2004)

49 completed projects

Project Num	TC Specific Field	TC General Field / No. of Projects	
RLA/0/006	General Industrial Applications	General Atomic Energy Development	5
RLA/0/009	Nuclear Information Processing, Capacity Building		
RLA/0/017	Nuclear Information Processing, Capacity Building		
RLA/0/018	Overall Programming		
RLA/0/019	Information Technology and Data Processing		
RLA/2/003	Radioanalytical Techniques	Nuclear Chemistry and Radiochemistry	2
RLA/2/007	Radiopharmaceuticals		
RLA/4/006	Nuclear Instrumentation, Electronics and Reactor Control	Nuclear Engineering and Technology	7
RLA/4/007	Research Reactors + Production of Isotopes		
RLA/4/008*	Nuclear Instrumentation, Electronics and Reactor Control		
RLA/4/011	Nuclear Instrumentation, Electronics and Reactor Control		
RLA/4/013	Management Systems (QS) for Nuclear Facilities		
RLA/4/014	Nuclear Instrumentation, Electronics and Reactor Control		
RLA/4/015	Nuclear Instrumentation, Electronics and Reactor Control		
RLA/5/019	Animal Production + Animal Diseases	Application of Isotopes and Radiation in Food and Agriculture	9
RLA/5/020	Food Irradiation		
RLA/5/021	Insect Pest Control		
RLA/5/023	Soil and Water Management and Crop Nutrition		
RLA/5/028	Animal Production		
RLA/5/035	Insect Pest Control		
RLA/5/036	Soil and Water Management and Crop Nutrition		
RLA/5/040	Food Irradiation		
RLA/5/043	Food Irradiation		
RLA/6/011	Nuclear Medicine Imaging Radiopharmacy	Radiation Medicine and Health	9
RLA/6/016	Nuclear Medicine Imaging		
RLA/6/027	Nuclear Medicine Imaging		
RLA/6/029	Radioisotope and Radiation Treatment		
RLA/6/036	Nuclear Medicine Imaging		
RLA/6/037	Nuclear Medicine Imaging		
RLA/6/038*	Radiopharmacy		
RLA/6/039	Radiation Medicine and Health		
RLA/6/044	Nuclear Medicine Imaging		
RLA/7/007	Nutrition and Health-Related Environmental Studies	Application of Isotopes and Radiation in Biology and Environmental Studies	1
RLA/8/014	Ground-Water Hydrology	Isotope Hydrology and Applications of Isotopes and Radiation in Industry	5
RLA/8/016	General Industrial Applications		
RLA/8/018	Civil Engineering		
RLA/8/023	Ground-Water Hydrology		
RLA/8/024	General Industrial Applications		
RLA/9/009	Radiation Protection + Safety Standards, Regulations and Procedures + Safety of Reactors and Nuclear Materials	Nuclear and Radiation Safety and Nuclear Security	11
RLA/9/011	Nuclear and Radiation Safety and Nuclear Security + Regulatory Infrastructure for Radiation and Waste Safety		
RLA/9/016	Radiation Protection + Safety Stds, Regulations & Procedures		
RLA/9/028	Radiation Protection		
RLA/9/031	Radiation Protection		
RLA/9/032	Radiation Protection		
RLA/9/033	Safety of Reactors and Nuclear Materials		
RLA/9/034	Safety of Reactors and Nuclear Materials		
RLA/9/035	Safety Standards, Regulations and Procedures		
RLA/9/043	Safety Standards, Regulations and Procedures		
RLA/9/046	Safety of Reactors and Nuclear Materials		

** The field of activity of RLA/4/008 is wrongly classified in TC-Pride under General Industrial Applications (8C); this analysis codes it as 4G. Also the field code assigned to RLA/6/038 is the historical subject 6G instead of 2G.*

20 Ongoing Projects

Project Num	TC Specific Field	TC General Field	No. of Proj.
RLA/0/022	Overall Programming	General Atomic Energy Development	1
RLA/2/010	Radiopharmaceuticals	Nuclear Chemistry and Radiochemistry	2
RLA/2/011	Radioanalytical Techniques		
RLA/4/017	Nuclear Instrumentation, Electronics and Reactor Control	Nuclear Engineering and Technology	1
RLA/6/032	Radiation Metrology and Dosimetry	Radiation Medicine and Health	7
RLA/6/041	Radiation Metrology and Dosimetry		
RLA/6/042	Nuclear Medicine Imaging		
RLA/6/043	Nuclear Medicine Imaging		
RLA/6/046	Radiation Metrology and Dosimetry		
RLA/6/048	Nuclear Medicine Imaging		
RLA/6/049	Radioisotope and Radiation Treatment		
RLA/7/009	Radiation Sterilization	Application of Isotopes and Radiation in Biology and Environmental Studies	2
RLA/7/010	Nutrition and Health-Related Environmental Studies		
RLA/8/028	General Industrial Applications	Isotope Hydrology and Applications of Isotopes and Radiation in Industry	3
RLA/8/030	Radiation Processing Facilities and Applications		
RLA/8/037	Ground-Water Hydrology		
RLA/9/042	Safety Standards, Regulations and Procedures	Nuclear and Radiation Safety and Nuclear Security	4
RLA/9/045	Radiation Protection		
RLA/9/048	Safety Standards, Regulations and Procedures		
RLA/9/049	Radiation Protection		

[1] *In 2006 the TC databases were modified to include the latest revision of TC fields by project. This analysis however, is based on the TC field codes that were available in August–September 2005.*

Source: TC-Pride

Annex 5. Total Core Approved Funds and Total Disbursements by Project (1983–2004)

Project No.	Field	First year of approval	Total approvals 1983-2004	Total disbursements 1983-2004
RLA/0/006	0	1983	677 300	809 080
RLA/0/009	0	1985	585 650	678 059
RLA/0/017	0	1999	358 000	307 139
RLA/0/018	0	1999	197 850	277 666
RLA/0/019	0	1999	90 400	77 481
RLA/0/022	0	2001	224 700	532 198
RLA/2/003	2	1986	758 600	1 002 607
RLA/2/007	2	1991	849 600	786 965
RLA/2/010	2	2001	580 300	373 024
RLA/2/011	2	2003	362 400	308 836
RLA/4/006	4	1986	745 100	1 209 383
*RLA/4/007**	*4*	*n/a*	*n/a*	*355 036*
RLA/4/008	4	1991	716 950	792 176
RLA/4/011	4	1995	518 000	503 914
RLA/4/013	4	1997	449 100	490 297
RLA/4/014	4	1999	255 600	243 794
RLA/4/015	4	1999	560 900	596 594
RLA/4/017	4	2001	649 220	557 080
RLA/5/019	5	1986	539 900	864 160
*RLA/5/020**	*5*	*n/a*	*n/a*	*50 057*
RLA/5/021	5	1986	235 300	837 675
*RLA/5/023**	*5*	*n/a*	*n/a*	*109 554*
RLA/5/028	5	1991	1 198 400	1 528 906
*RLA/5/035**	*5*	*n/a*	*n/a*	*356 254*
RLA/5/036	5	1995	457 500	548 733
*RLA/5/040**	*5*	*n/a*	*n/a*	*37 360*
RLA5/0/43	5	1999	69 700	54 427
RLA/6/011	6	1986	221 100	638 935
RLA/6/016	6	1991	247 000	305 712
RLA/6/027	6	1995	720 800	718 863
RLA/6/029	6	1995	173 925	707 620
RLA/6/032	6	1997	1 067 825	931 562
RLA/6/036	6	1999	263 100	203 720
RLA/6/037	6	1999	171 250	142 644
RLA/6/038	6	1999	138 400	106 533
RLA/6/039	6	1999	108 200	193 517
RLA/6/041	6	1999	536 900	934 896
RLA/6/042	6	2001	404 410	362 142
RLA/6/043	6	2001	417 550	434 765
RLA/6/044	6	2001	265 300	263 220
RLA/6/046	6	2001	1 020 600	716 832
RLA/6/048	6	2003	496 100	289 392
RLA/6/049	6	2003	317 100	318 301
RLA/7/007	7	1999	233 700	215 029
RLA/7/009	7	2001	290 740	264 537
RLA/7/010	7	2001	229 350	188 852
RLA/8/014	8	1989	121 050	799 157
RLA/8/016	8	1991	788 100	1 123 144
RLA/8/018	8	1991	338 600	316 558
RLA/8/023	8	1997	329 190	340 232
RLA/8/024	8	1999	244 700	266 623
RLA/8/028	8	2001	416 000	548 727
RLA/8/030	8	2001	219 500	134 543
RLA/8/037	8	2003	400 240	30 307
RLA/9/009	9	1986	423 300	684 166
RLA/9/011	9	1991	280 150	504 650
RLA/9/016	9	1993	378 900	270 289
RLA/9/028	9	1997	512 800	513 658
RLA/9/031	9	1999	257 700	228 864
RLA/9/032	9	1999	285 750	222 856
RLA/9/033	9	1999	175 000	167 649
RLA/9/034	9	1999	30 000	48 298
RLA/9/035	9	1999	432 500	535 343
RLA/9/042	9	2001	246 260	75 452
RLA/9/043	9	2001	331 500	284 365
RLA/9/045	9	2001	297 220	305 216
RLA/9/046	9	2001	147 500	149 103
RLA/9/048	9	2003	255 750	44 377
RLA/9/049	9	2003	300 000	152 027
			25 615 530	**29 971 128**

** These projects had only extrabudgetary funding, for this reason they do not have any amount under the column of approvals.*

Source : Official Agency data provided by TCPCS

Annex 6: Concrete Outputs Obtained from the Implementation of 49 Completed Projects (1983–2004)

	Project	Manuals	Guides	Technical Reports and Documents	Documents of Norms and Procedures	Protocols, Codes and Standard	Evaluations	Bibliographic Compilations	Technical Studies	Books	Training Materials	Lab Inter-comparisons	Info Networks/ Databases/ Web pages	Software	Promotional Material, Publications, Brochures, videos
1	RLA/0/006														Yes
2	RLA/0/009						1		1						
3	RLA/0/017	2						2					2		Yes
4	RLA/0/018	1													Yes
5	RLA/0/019			1											
6	RLA/2/003			2	6							1		1	Yes
7	RLA/2/007					4									
8	RLA/4/006						1								
9	RLA/4/007								1						
10	RLA/4/008	1		1									1		
11	RLA/4/011			1							1				
12	RLA/4/013	1	1										1		
13	RLA/4/014				2								1		
14	RLA/4/015			4									1		
15	RLA/5/019												1		
16	RLA/5/020														
17	RLA/5/021														
18	RLA/5/023														Yes
19	RLA/5/028														Yes
20	RLA/5/035			4								1			Yes
21	RLA/5/036	5								1			1		Yes
22	RLA/5/040				1										Yes
23	RLA/5/043		1			2									
24	RLA/6/011														
25	RLA/6/016														
26	RLA/6/027														
27	RLA/6/029					6									
28	RLA/6/036				3		1								
29	RLA/6/037	1												1	
30	RLA/6/038			1											
31	RLA/6/039														
32	RLA/6/044								1						
33	RLA/7/007													1	
34	RLA/8/014								4						
35	RLA/8/016										1				
36	RLA/8/018			1											
37	RLA/8/023														
38	RLA/8/024		5		1								1		
39	RLA/9/009				1		1					1			
40	RLA/9/011				1										Yes
41	RLA/9/016				3				1	1					Yes
42	RLA/9/028	1	11				1				1				Yes
43	RLA/9/031	1		1		2					1		1		
44	RLA/9/032		3	3								2			
45	RLA/9/033			4											
46	RLA/9/034														
47	RLA/9/035	1				6	5								
48	RLA/9/043						2				1				Yes
49	RLA/9/046			6	1										
	TOTAL	**14**	**21**	**29**	**19**	**20**	**12**	**2**	**8**	**2**	**5**	**5**	**10**	**3**	

Source: Constructed using data from the report on "Outputs and impact of 20 years of ARCAL projects", which was prepared based on the inputs provided by ARCAL participating countries"

Appendix 1:

IAEA Fields of Activity used for TC Projects

Code Description
0A General Atomic Energy Development
0B Overall Programming
0C Nuclear Material Management (Safeguards)
0D Development of National Nuclear Law
0E Sustainable Energy Development
0F Nuclear Information Processing, Capacity Building
0G Administration in Nuclear Fields
0H Nuclear Centres and Laboratories
0I Education, Training and Nuclear Knowledge Management
0J Information Technology and Data Processing
0K Public Information and Communication
0L Security of Material (Historical subject. As of 2004 use Field 9)
0M Country Programme Framework
0N Strengthening Institutional Capacity for Sustainability and Self-Reliance
0O Resource Mobilization and Partnership Development
0P Technical Cooperation among Developing Countries (TCDC)
0Q Quality Management (QM) in Nuclear Applications
1A Nuclear and Atomic Physics
1B Theoretical Physics
1C Atomic Physics
1D Nuclear Physics
1E Neutron Physics
1F Reactor Physics
1G Solid State Physics
1H Plasma Physics and Fusion Research
1I High Energy Physics
1J Mass Spectrometry and Mass Separators
1K Radiometry and Dosimetry (Historical subject. As of 2004 use 6F)
1L Analytical Nuclear Physics
1M Accelerators – Applications in Physics
2A Nuclear Chemistry and Radiochemistry
2B Radiochemistry
2C Radioanalytical Techniques
2D Radiation Chemistry
2E Physical Chemistry (Historical subject)
2F Preparation of Labelled Compounds
2G Radiopharmaceuticals
2H Quality Management (QM) of Radiopharmaceuticals
2I Quality Management (QM) and Good Laboratory Practice (GLP) for Radioanalytical Techniques
3A Fuel Cycle and Waste Management
3B Raw Material
3C *Evaluation of Uranium and Thorium Ore Deposits and other Ores of Nuclear Interest (Historical subject. As of 2004 use 3B)*
3D *Mining of Nuclear Raw Materials (Historical subject. As of 2004 use 3B)*
3E *Analysis of Nuclear Raw Materials (Historical subject. As of 2004 use 3B)*
3F *Processing of Nuclear Materials (Historical subject. As of 2004 use 3B)*
3G Nuclear Fuel Management (From Fresh to Spent)
3H Radioactive Waste Management Technology and Infrastructure

IAEA Fields of Activity used for TC Projects

3I Predisposal of Radioactive Waste
3J Disposal of Radioactive Waste
3K Decommissioning of Nuclear Facilities
3L Environmental Remediation
3M Sealed Radioactive Sources Management
3N Information Technology for Radioactive Waste
3O Nuclear Fuel Performance
3P Innovative Fuel Cycle Technology
4A Nuclear Engineering and Technology
4B Research Reactors
4C Power Reactors
4D Reactor Technology
4E Reactor Metallurgy and Materials
4F Nuclear Chemical Engineering
4G Nuclear Instrumentation, Electronics and Reactor Control
4H Production of Isotopes
4J Fuel Element Reprocessing (Historical subject)
4K Irradiation Effects on Equipment and Materials
4L Radiation Engineering and Accelerator Technology
4M Management Systems (MS) for Nuclear Facilities
4N Nuclear Fuel Management (Historical subject. As of 2004 use Field 3)
4O Radioactive Waste Management Technologies (Historical subject. As of 2004 use Field 3)
4P Nuclear Engineering Infrastructure Development
4Q Human Resources for Nuclear Engineering and Technology
4R Engineering Economics for Nuclear Power Plant
4S Information Technology for Nuclear Power Plant
4T Nuclear Power Plant Life Cycle Management
4U Nuclear Power Plant Operational Support
4V Nuclear Power Plant Planning and Pre-Operational Support
4W Innovative Nuclear Power Systems
4X Nuclear Power for Desalination and for other Non-Electric Applications
5A Application of Isotopes and Radiation in Food and Agriculture
5B Soil and Water Management and Crop Nutrition
5C Plant Breeding and Genetics
5D Insect Pest Control
5E Animal Production
5F Animal Diseases
5G Contaminants and Residues in Food and Environment
5H Food Irradiation
5I Plant Pathology (Historical subject. As of 2004 use 5C)
6A Radiation Medicine and Health
6B Nuclear Medicine Imaging
6C Radioisotope and Radiation Treatment
6D Fundamental Medical Research (Historical subject)
6E Radiotoxicology (Historical subject)
6F Radiation Metrology and Dosimetry
6G Radiopharmacy (Historical subject. As of 2004 use 2G)
6H Diagnostic Radiology
6I Health Effects of Contaminants
6J Assessment of Micronutrients in Nutrition
7A Application of Isotopes and Radiation in Biology and Environmental Studies
7C Somatic Effects of Radiation

IAEA Fields of Activity used for TC Projects

7D Genetic Effects of Radiation
7E Radiation Sterilization
7F Radioecology
7G Dosimetry in Radiation Biology
7H Preparation of Vaccines
7I Radiation Biology
7J Nutritional and Health-Related Environmental Studies (Historical subject. As of 2004 use 6I and 6J)
7K Environmental Assessment and Remediation Strategies
7L Isotopes and Radiotracers in Ecotoxicology and Pollution Studies
7M Marine Environment and Coastal Zone Management
7N Quality Management (QM) of Analytical Measurements
8A Isotope Hydrology and Applications of Isotopes and Radiation in Industry
8B (Historical subject)
8C General Industrial Applications (Historical subject. As of 2004 use 8G to 8Q)
8D (Historical subject)
8E Non-Nuclear Materials (Historical subject. As of 2004 use 8J)
8F Civil Engineering (Historical subject. As of 2004 use 8J)
8G Industrial Pollution Studies and Non-Radioactive Effluent Disposal
8H Radiation Processing Facilities and Applications
8I Multi-Purpose Irradiation (Historical subject. As of 2004 use 8H)
8J Radiation Technologies and Tracer Techniques for Industrial Processes
8M Ground-Water Hydrology
8N Surface-Water Hydrology
8O Analytical and Instrumental Techniques
8P Non-Destructive Testing (NDT) and Examination (NDE)
8Q Quality Management (QM) for Radiation Technologies and Industrial Applications
9A Nuclear and Radiation Safety and Nuclear Security
9B Safety Standards, Regulations and Procedures (Historical subject. As of 2004 use 9E to 9X)
9C Regulatory Infrastructure for Radiation and Waste Safety
9D Safety of Reactors and Nuclear Materials (Historical subject. As of 2004 use 9M to 9X)
9E Safe Predisposal and Disposal of Radioactive Waste
9F Safety Assessment of Nuclear Facilities
9G Safety of Environmental Remediation
9H Regulatory Infrastructure for Nuclear Safety
9I Occupational Exposure Control
9J Medical Exposure Control
9K Public Exposure Control
9L Emergency Preparedness and Response
9M Engineering Safety
9N Operational Safety
9O Research Reactor Safety
9P Fuel Cycle Facility Safety
9Q Environmental Exposure Control
9R Safety of Decommissioning of Nuclear Facilities
9S Transport Safety
9T Safety and Security of Radiation Sources
9U Security of Nuclear and Radioactive Materials
9V Physical Protection
9W Prevention and Response to Illicit Trafficking and Nuclear Threats
9X Education and Training in Radiation and Waste Safety
XX Not in Agency's Purview

Source: TC Department (Rev. April 2004)