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COUNTRY PROGRAMME SUMMARY

**THE AGENCY'S TECHNICAL CO-OPERATION
PROGRAMME WITH
COLOMBIA
1983 - 1993
COUNTRY PROGRAMME SUMMARIES**

DEPARTMENT OF TECHNICAL CO-OPERATION

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COUNTRY PROGRAMME SUMMARIES

EVALUATION SECTION

DEPARTMENT OF TECHNICAL CO-OPERATION

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COLOMBIA
1983 - 1993
COUNTRY PROGRAMME SUMMARIES**

This report contains a review of the Agency's technical co-operation activities in Colombia carried out during 1983 - 1993. In terms of coverage and analytical depth, country programme summaries stand somewhere midway between in-depth country programme evaluations and individual project evaluations. They attempt to provide a comprehensive, descriptive picture of the Agency's co-operation with a Member State in a manner that will be particularly useful for programming decisions. The attempt is very much to describe -- largely through statistical data -- not to provide independent analysis and evaluation.

COLOMBIA

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INTRODUCTION

The country programme summary reported on here is one in the series of such studies being undertaken of the Agency's TC programme with Member States. With over \$7.3 million of Agency support received, Colombia ranks 28th among all recipients of technical assistance during the period 1958 through 1992.

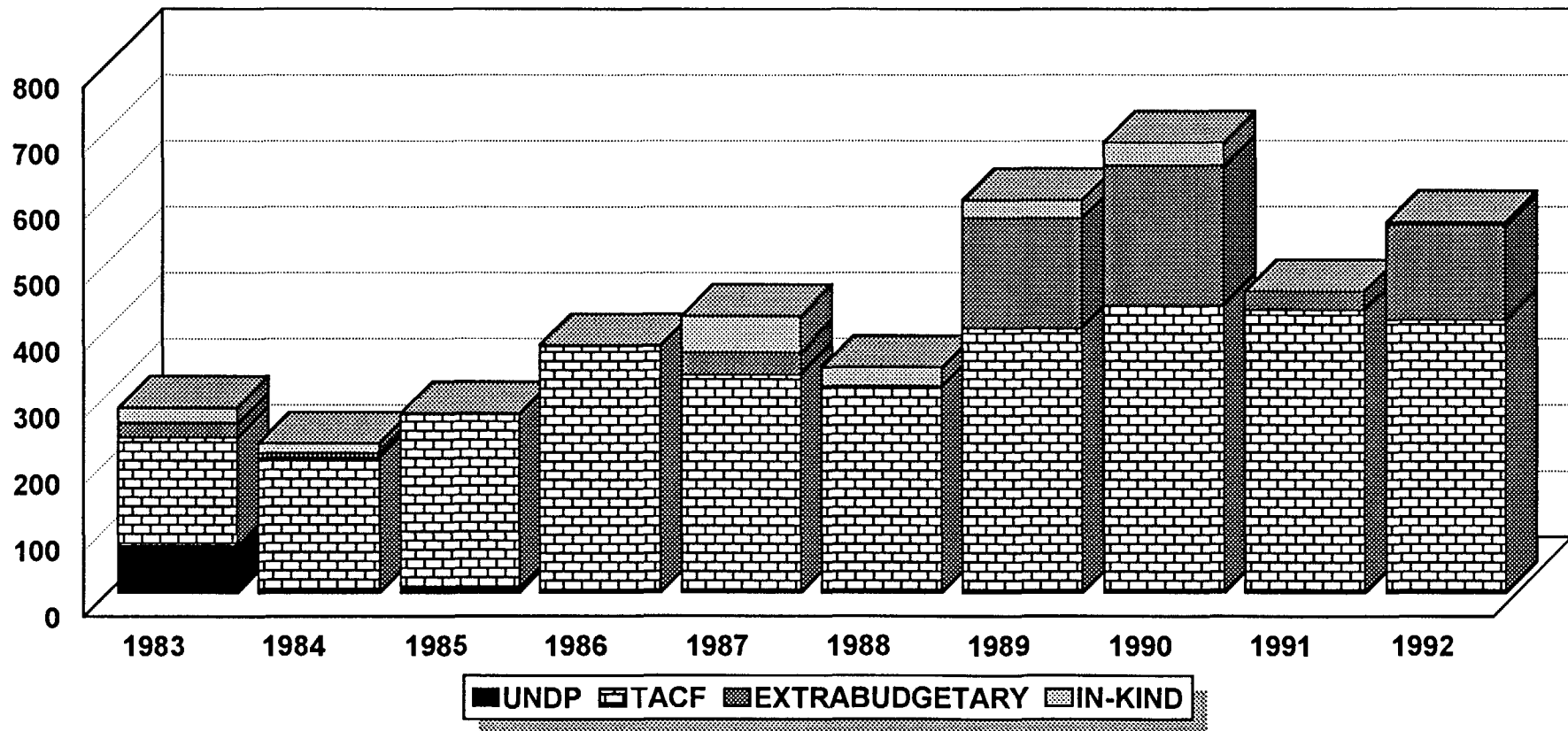
More than half of the assistance received during the past ten years has been provided in the form of equipment (63%), complemented to almost equal parts by expert services (19%) and training (18%). The bulk of the resources was made available through the TACF (79%), while only small shares were provided through extrabudgetary contributions (15%), through assistance in kind (4%) and through UNDP (2%).

With regard to total disbursements -- by sector -- under those projects that were operational during the period 1983 through mid-April 1993, the largest area has been nuclear raw materials (28%), followed by nuclear physics and chemistry (18%), agriculture (17%), nuclear engineering and technology (16%), and industry and hydrology (14%).

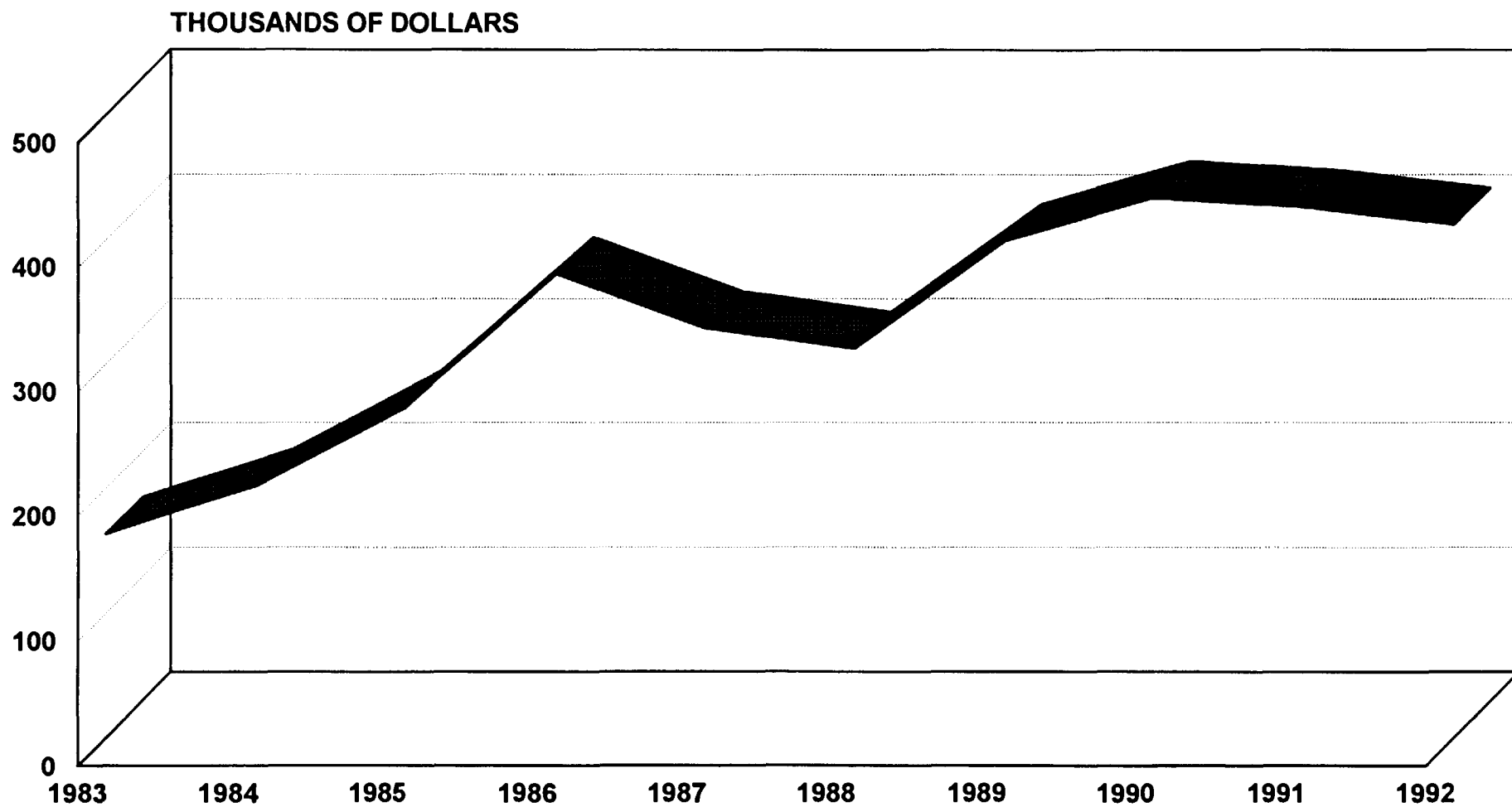
During the same period, the country has provided experts and training course lecturers for a total of 82 assignments, and has hosted 28 fellowships and scientific visits as well as 15 regional training courses with a total of 149 participants.

ASSISTANCE PROVIDED BY THE AGENCY TO COLOMBIA BY SOURCE (1983- 1992)

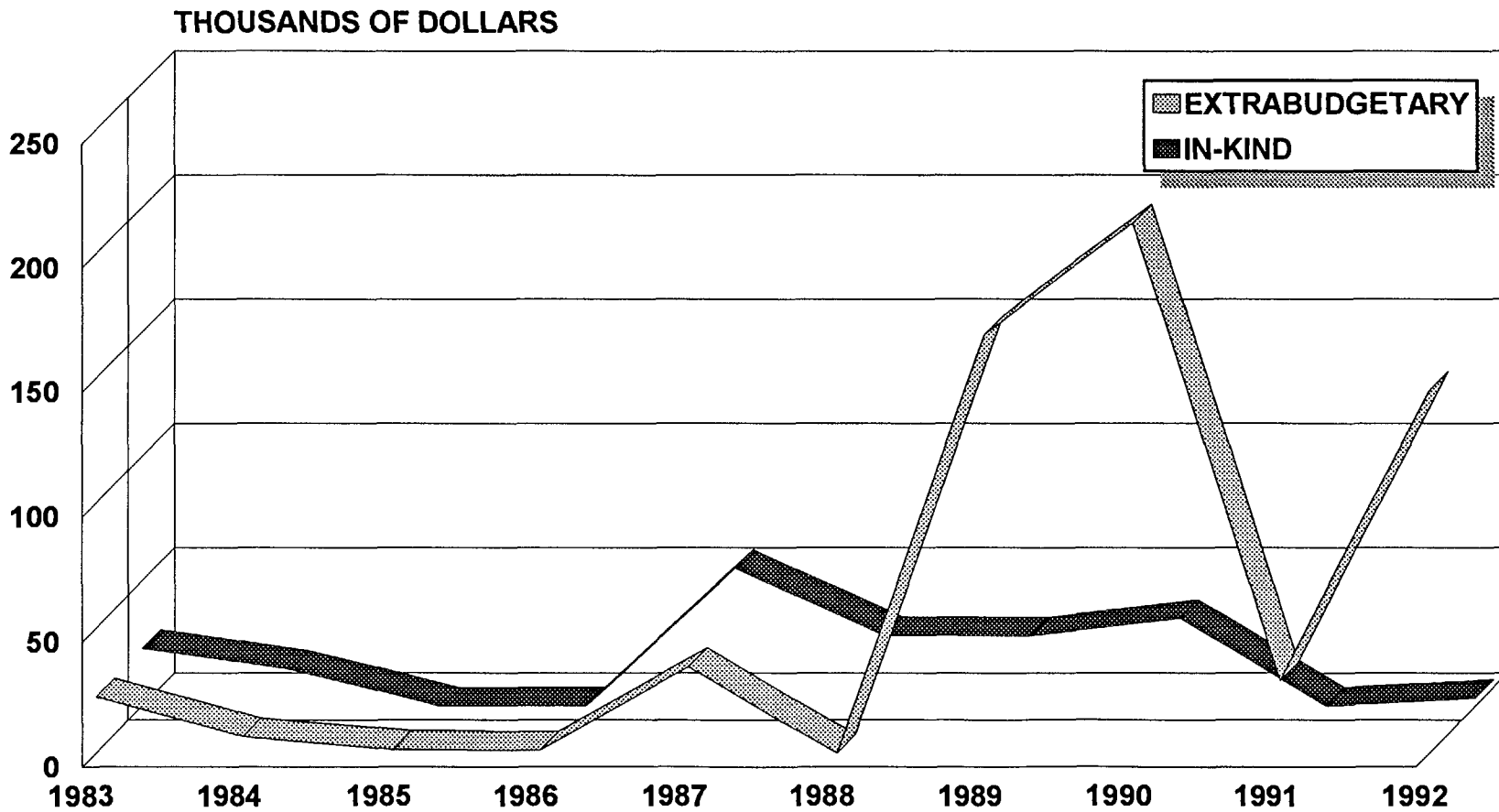
THOUSANDS OF DOLLARS



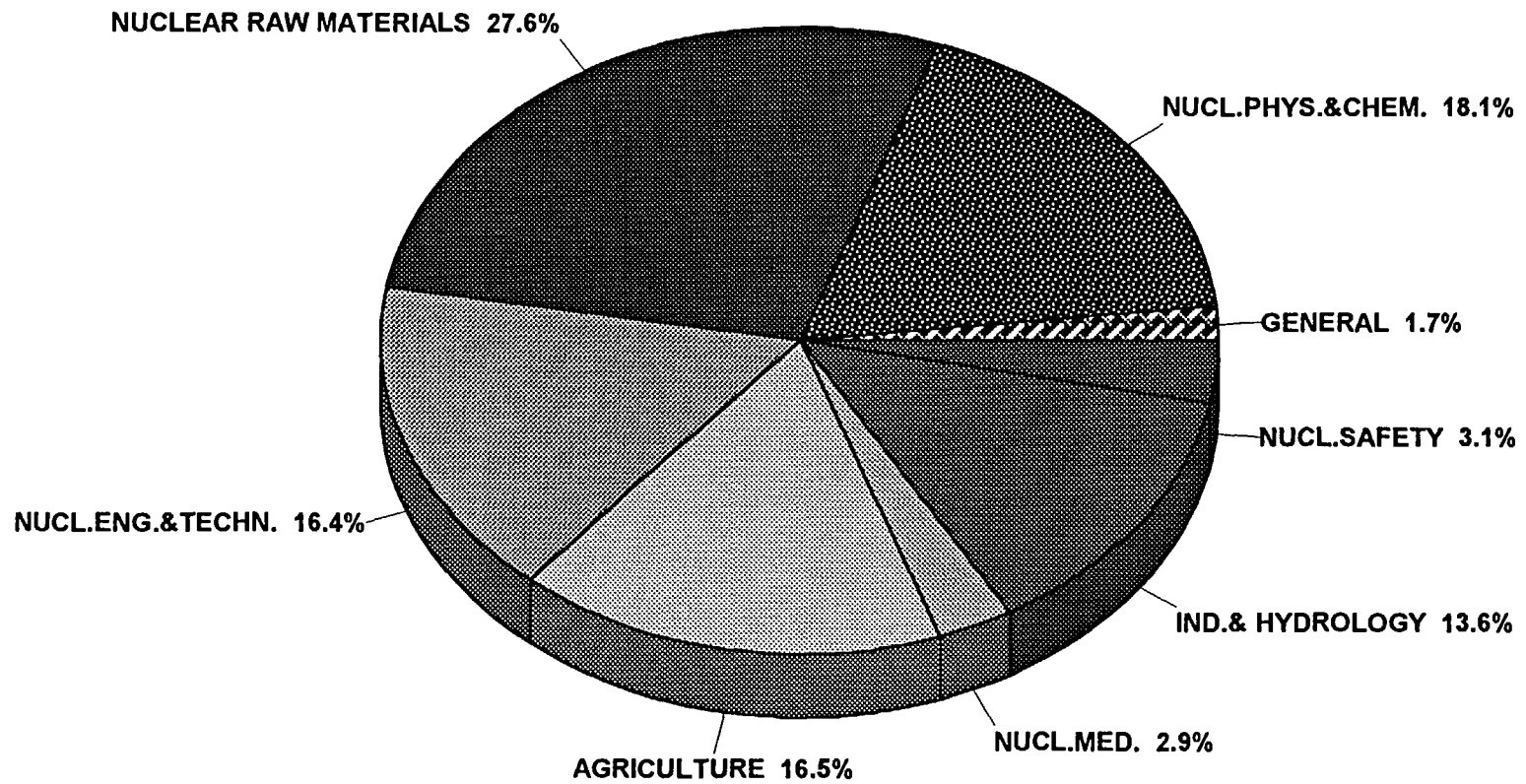
TACF ASSISTANCE PROVIDED TO COLOMBIA (1983 - 1992)



EXTRABUDGETARY AND IN-KIND ASSISTANCE TO COLOMBIA (1983-1992)

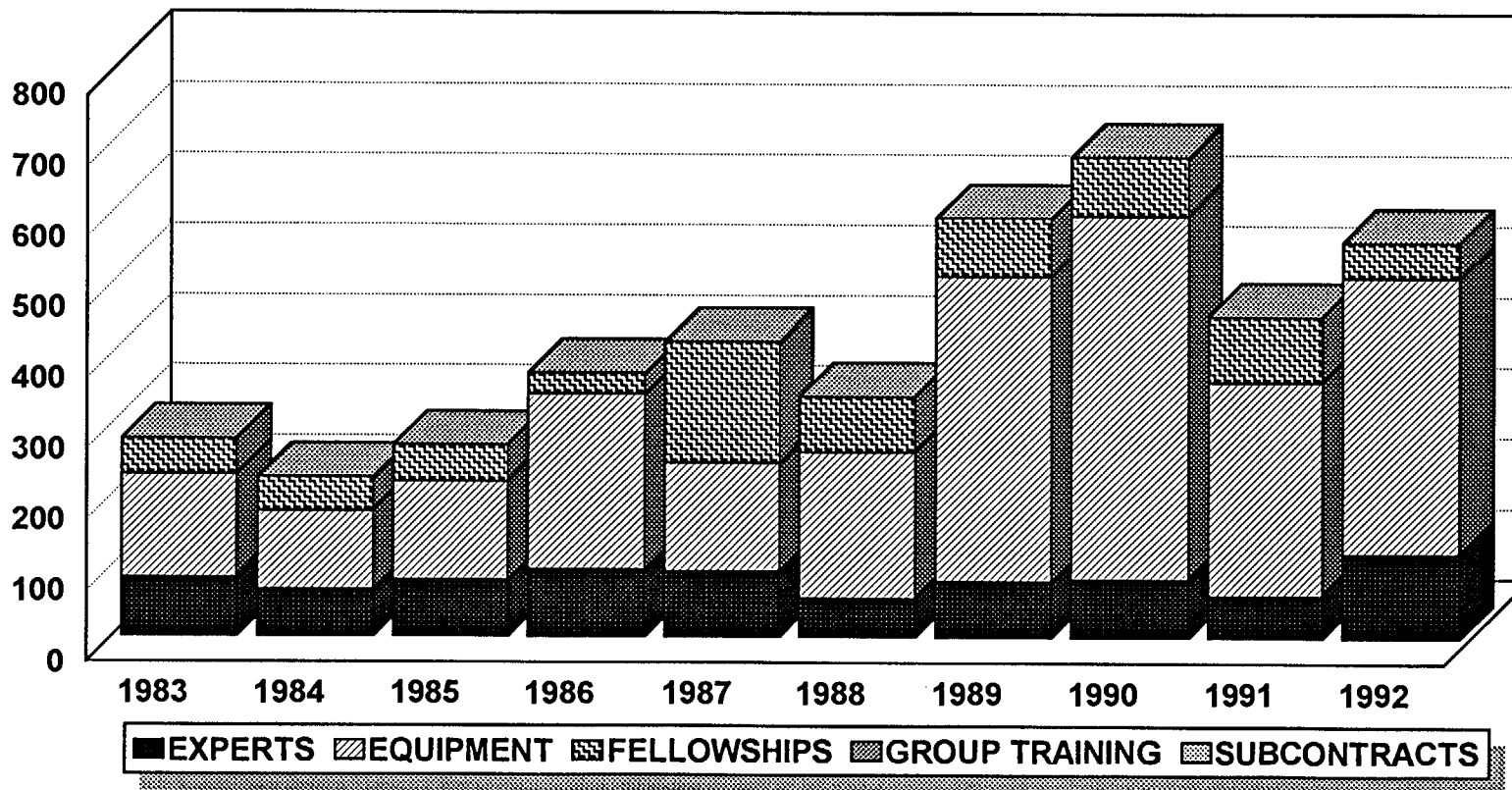


TC PROJECT DISBURSEMENTS IN COLOMBIA BY SECTOR (1983 - 1993)

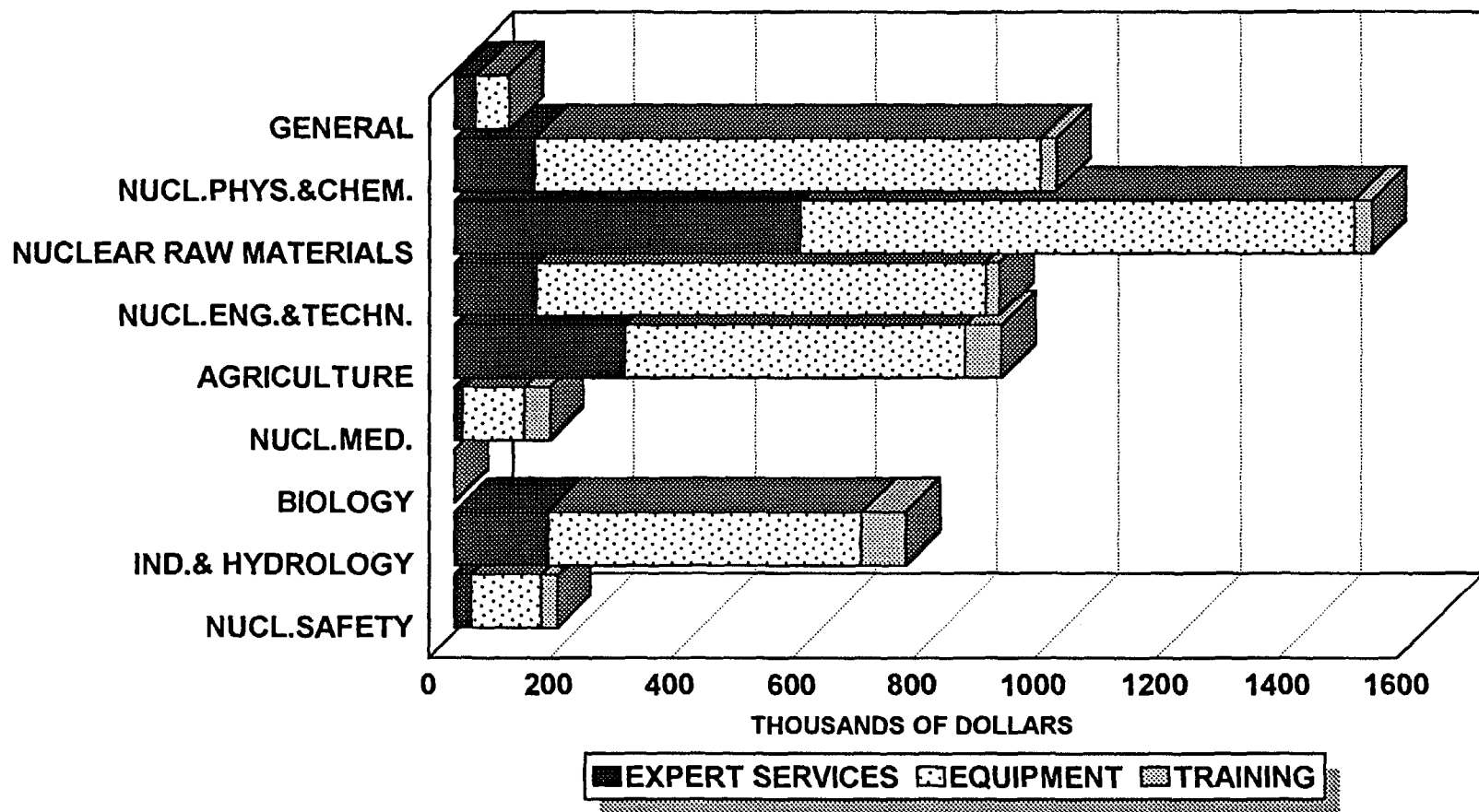


ASSISTANCE PROVIDED BY THE AGENCY TO COLOMBIA BY TYPE (1983 - 1992)

THOUSANDS OF DOLLARS



EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO COLOMBIA BY SECTOR (1983 - 1993)



THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH COLOMBIA

ALL SOURCES

COLOMBIA'S RANKING AS A TC RECIPIENT
1958 - 1992
(in \$1000)

YEAR	RANKING	AMOUNT
1958-82	17 th	3159.4
1983	29 th	278.8
1984	35 th	224.8
1985	30 th	270.5
1986	34 th	373.2
1987	32 nd	417.5
1988	29 th	339.7
1989	18 th	593.8
1990	16 th	680.8
1991	32 nd	454.6
1992	28 th	559.8
1958-92	28 th	7352.9

**"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1992 (in \$1000)**

ALL SOURCES

Year	I	II	III	IV	V	COLOMBIA
1958-82	BRA 8507.3	IND 6849.4	ARG 5528.2	PAK 5492.7	CHI 5240.1	17 th - 3159.4
1983	EGY 2077.9	PER 1116.8	VIE 948.1	PHI 778.6	IRA 722.1	29 th - 278.8
1984	EGY 3625.9	PER 1750.4	THA 1094.6	CUB 1028.7	PHI 881.2	35 th - 224.8
1985	EGY 2494.8	PER 1120.7	THA 1117.4	BGD 1068.2	PHI 963.7	30 th - 270.5
1986	EGY 2317.0	BRA 1452.9	THA 1169.4	POL 1050.3	BGD 896.4	34 th - 373.2
1987	HUN 3452.6	EGY 1775.4	THA 1742.4	INS 1312.5	YUG 1223.2	32 nd - 417.5
1988	EGY 1486.9	BUL 1361.6	CPR 1278.5	THA 1158.7	BRA 1096.7	29 th - 339.7
1989	CPR 1542.3	EGY 1505.1	THA 1205.3	BRA 1096.5	INS 999.1	18 th - 593.8
1990	POL 2308.1	CPR 2005.0	VIE 1589.2	INS 1412.6	BRA 1229.1	16 th - 680.8
1991	INS 1305.2	CPR 975.0	EGY 959.8	BRA 951.2	BUL 934.7	32 nd - 654.6
1992	EGY 1586.3	INS 1342.1	CPR 1328.8	MEX 1127.8	POL 1036.4	28 th - 559.8
1958-92	EGY 23808.6	BRA 17736.8	THA 15332.0	INS 13725.9	PER 13129.6	28 th - 7352.9

***TOP FIVE* RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1992 (in \$1000)**

TECHNICAL ASSISTANCE AND CO-OPERATION FUND

Year	I	II	III	IV	V	COLOMBIA
1958-82	HUN 2971.7	EGY 2405.8	PAK 2340.5	THA 2000.3	BRA 1983.5	37 th - 825.5
1983	EGY 1049.4	VIE 897.4	POL 667.8	PAK 498.5	PHI 430.0	36 th - 162.5
1984	EGY 1197.2	CUB 655.6	ECU 565.6	BGD 506.3	BUL 472.4	31 st - 201.8
1985	BGD 991.8	VIE 745.0	THA 708.7	BRA 571.8	POR 538.7	25 th - 264.1
1986	BRA 1381.8	THA 871.9	POL 833.5	BGD 823.9	SYR 751.8	27 th - 372.1
1987	HUN 3305.2	DRK 986.8	BUL 888.5	INS 885.8	EGY 878.9	30 th - 328.2
1988	BUL 1195.6	PER 856.5	EGY 768.6	INS 751.7	MAL 656.0	21 st - 311.5
1989	EGY 990.9	CPR 868.2	POR 769.6	CHI 756.9	MAL 619.4	22 nd - 398.4
1990	POL 1562.3	VIE 1518.8	DRK 1156.2	IRA 958.0	YUG 933.4	24 th - 433.2
1991	BUL 893.1	PAK 868.8	INS 855.1	VIE 817.6	CPR 814.5	25 th - 425.8
1992	EGY 1255.7	CPR 1009.0	VIE 872.8	INS 826.6	IRA 795.5	32 nd - 411.7
1958-92	EGY 10847.0	HUN 8743.7	POL 8486.4	VIE 8199.9	PAK 8115.6	29 th - 4134.8

ASSISTANCE PROVIDED BY THE AGENCY TO COLOMBIA

Financial Summary 1983 - 1992
(In thousands of dollars)

Year	ASSISTANCE PROVIDED, BY TYPE						ASSISTANCE PROVIDED, BY SOURCE					
	Experts	Equipment	Fellowships	Group training	Sub-contracts	Total	UNDP	TACF CC	TACF NCC	Extra-budgetary	In-kind	Total
1983	82.8	145.4	50.6	-	-	278.8	70.9	158.0	4.5	22.4	23.0	278.8
1984	66.9	109.9	48.0	-	-	224.8	1.9	200.2	1.6	6.5	14.6	224.8
1985	80.2	138.8	51.5	-	-	270.5	5.0	248.2	15.9	1.4	-	270.5
1986	94.9	248.2	30.1	-	-	373.2	-	369.9	2.2	1.1	-	373.2
1987	92.7	152.9	171.9	-	-	417.5	-	298.5	29.7	34.3	55.0	417.5
1988	54.9	206.3	78.5	-	-	339.7	-	311.5	-	-	28.2	339.7
1989	78.7	431.8	83.3	-	-	593.8	-	378.9	19.5	167.5	27.9	593.8
1990	81.9	514.4	84.5	-	-	680.8	-	398.9	34.3	212.6	35.0	680.8
1991	59.2	302.2	93.2	-	-	454.6	-	423.2	2.6	28.8	-	454.6
1992	118.9	390.4	50.5	-	-	559.8	-	411.7	-	145.1	3.0	559.8
1983-92	811.1	2 640.3	742.1	-	-	4 193.5	77.8	3 199.0	110.3	619.7	186.7	4 193.5

TECHNICAL CO-OPERATION PROJECTS IN COLOMBIA
BY SECTOR

PROJECTS COMPLETED AND OPERATIONAL 1983 - 1993

TOTAL PROJECT ALLOTMENTS AND DISBURSEMENTS
(as of mid-April 1993)

SECTOR	NO. OF PROJECTS	ALLOTMENTS \$	% OF TOTAL	DISBURSEMENTS \$	% OF TOTAL
General atomic energy development	4	141 400	1.9	91 297	1.7
Nuclear physics and chemistry	9	1 234 406	16.4	996 444	18.2
Nuclear raw materials	4	1 513 597	20.2	1 516 661	27.6
Nuclear engineering and technology	8	1 711 820	22.8	902 460	16.4
Nuclear techniques in agriculture	11	1 052 054	14.0	905 447	16.5
Nuclear medicine	3	357 139	4.8	159 815	2.9
Nuclear techniques in biology	-	-	-	-	-
Nuclear techniques in industry and hydrology	9	1 123 056	15.0	747 900	13.6
Nuclear safety	3	365 060	4.9	172 351	3.1
TOTAL	51	7 498 532	100.0	5 492 375	100.0

TECHNICAL CO-OPERATION PROJECTS IN COLOMBIA
 COMPLETED AND OPERATIONAL, BY SECTOR, 1983 - 1993
 (As of mid-April 1993)

Sector	No. of projects	Total project allotments \$	Total project disbursements \$
<u>Completed projects</u>			
General atomic energy development	3	84 100	84 946
Nuclear physics and chemistry	5	732 342	716 174
Nuclear raw materials	4	1 513 597	1 516 661
Nuclear engineering and technology	4	656 089	664 705
Nuclear techniques in agriculture	7	720 069	727 688
Nuclear medicine	2	170 739	159 815
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	5	512 665	523 102
Nuclear safety	2	169 310	171 431
TOTAL	32	4 558 911	4 564 522
<u>Operational projects</u>			
General atomic energy development	1	57 300	6 351
Nuclear physics and chemistry	4	502 064	280 270
Nuclear raw materials	-	-	-
Nuclear engineering and technology	4	1 055 731	237 755
Nuclear techniques in agriculture	4	331 985	177 759
Nuclear medicine	1	186 400	-
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	4	610 391	224 798
Nuclear safety	1	195 750	920
TOTAL	19	2 939 621	927 853

**EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO COLOMBIA, BY SECTOR
PROJECTS COMPLETED AND OPERATIONAL 1983 - 1993
(As of mid-April 1993)**

FIELD	TOTAL PROJECT ALLOTMENTS				TOTAL PROJECT DISBURSEMENTS			
	EXPERT SERVICES		EQUIPMENT	TRAINING	EXPERT SERVICES		EQUIPMENT	TRAINING
	M/M	\$	\$	\$	M/M	\$	\$	\$
General atomic energy development	9/00	69 400	72 000	-	4/07	35 762	55 535	-
Nuclear physics and chemistry	27/17	219 750	968 296	46 360	20/13	133 682	836 769	25 993
Nuclear raw materials	95/21	568 968	914 917	29 712	96/00	572 033	914 916	29 712
Nuclear engineering and technology	22/19	188 920	1 485 476	37 424	16/10	136 367	743 112	22 981
Nuclear techniques in agriculture	38/19	286 825	647 680	117 549	35/26	284 386	560 429	60 632
Nuclear medicine	2/22	25 440	277 195	54 504	1/24	14 345	101 577	43 893
Nuclear techniques in biology	-	-	-	-	-	-	-	-
Nuclear techniques in industry & hydrology	20/00	157 902	895 258	69 896	19/00	157 126	517 805	72 969
Nuclear safety	7/09	67 676	252 601	44 783	3/16	28 414	116 821	27 116
TOTAL	223/17	1 584 881	5 513 423	400 228	197/06	1 362 115	3 846 964	283 296

AGENCY FELLOWS FROM COLOMBIA

1983 - 1993¹
(As of mid-April 1993)

Sector	No. of fellowships	No. of months/days	Host countries
General atomic energy development	8	12/26	URU, BRA, ARG, CHI, IAEA
Nuclear physics	13	101/07	HUN, NIC, GER, ECU, USA, ITA, UK, IAEA
Nuclear chemistry	4	20/00	SPA, CAN, GUA, ITA
Nuclear raw materials	5	22/10	USA, BRA, ARG, CEC
Nuclear engineering and technology	9	44/19	ARG, HUN, VEN, USA, SPA, DEN, IAEA
Nuclear techniques in agriculture	15	77/12	BRA, AUL, COS, SPA, MEX, USA, ECU, IAEA
Nuclear medicine	11	67/03	USA, SPA, ARG, URU, CHI
Nuclear techniques in biology	1	4/02	HUN
Nuclear techniques in industry and hydrology	17	52/22	ITA, MEX, FRA, BRA, CZE, AUS, ARG, IAEA
Nuclear safety	12	40/20	ARG, SPA, ECU, VEN, BRA
TOTAL	95	443/01	

¹/ Only includes fellows who have completed or at least started training.

COLOMBIA
LONG-TERM FELLOWSHIPS
1983 - 1993
(As of mid-April 1992)

Name	Field of study	Host country	Date	Duration	Project
CARDENAS COLLAZOS	Analytical nuclear physics	GER	Mar.87 - Mar.88	12/01	-
GUZMAN BAENA	Material research	GER	May 87 - May 88	12/01	-
OROZCO DIAZ	Solid state physics	UK	Oct.83 - Dec.85	26/20	-
PINEDA REY	Reactor physics	ITA	Oct.86 - Oct.87	12/01	COL/4/006
RAMIREZ VALENCIA	Neutron physics	HUN	Oct.83 - Apr.84	18/02	INT/1/018
ZULOAGA MOYA	Analysis of geological and environmental samples	CEC	Jan.90- Jan.91	12/02	RLA/0/013
DUQUE OSPINA	Research reactors	ARG	Apr.87 - Apr.88	12/00	COL/4/006
ALVAREZ FARACCO	Plant breeding	BRA	Feb.87 - Aug.88	18/00	COL/5/008
HIGUERA ROBLES	Animal health	AUL	Aug.86 - Aug.87	12/01	COL/5/005
FORERO BARRERA	Nuclear medicine	USA	Jul.83 - Jul.a84	12/01	-
SANCHEZ VASQUEZ	Nuclear medicine	USA	Apr.91 - Feb.93	22/03	COL/6/005

COLOMBIA
LONG-TERM FELLOWSHIPS
1983 - 1993
(As of mid-April 1992)

Name	Field of study	Host country	Date	Duration	Project
TORRES QUINTERO	Isotope hydrology	SPA	May 82 - Jul.83	14/01	COL/8/009
PUERTA ORTIZ	Dosimetry	BRA	Feb.88 - Feb.89	12/00	RLA/9/009
QUINTERO LONDONO	Nuclear Safety	ARG	Mar.87 - Mar.88	12/01	COL/1/005

COLOMBIAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1983 - 1993
(As of mid-April 1993)

Name	Field of study	Host country	Date	Duration	Project
ALVAREZ FARACCO	1. Plant breeding 2. Plant breeding 3. Plant breeding	BRA BRA BRA	Nov.85 - Dec.85 Feb.87 - Aug.88 Oct.90 - Nov.90	0/26 18/00 1/12	RLA/0/006 COL/5/008 COL/5/008
ANDRADE LONDONO	1. Nuclear instrumentation 2. Library and scientific documentation	URU CHI ARG BRA	Nov.85 Oct.88 - Nov.88	0/25 0/19	RLA/0/006 RLA/0/009
DUQUE OSPINA	1. Research reactors 2. Use of radioisotopes in industry	ARG BRA	Apr.87 - Apr.88 Jul.90 - Jan.91	12/00 6/01	COL/4/006 COL/8/016
GOMEZ GOMEZ	1. Reactor utilization 2. Neutron activation analysis	ECU CAN	Aug.84 Feb.91 - Jun.91	0/04 3/28	- COL/1/006
GONZALEZ VARELA	1. Nuclear instrumentation 2. Nuclear instrumentation 3. Research reactor instrumentation	HUN USA USA	Oct.85 - Jun.86 Aug.88 - Dec.88 May 90 - Aug.90	8/01 4/00 3/01	COL/4/006 COL/4/006 RLA/0/011
GUZMAN BAENA	1. Reactor utilization 2. Material research	ECU GER	Aug.84 May 87 - May 88	0/04 12/01	- -
HERRERA RIVERA	1. Radiotracer technology 2. Tracer techniques for industrial processes	CZE ARG	Oct.89 - Feb.90 Nov.91 - May 92	4/21 6/00	RLA/0/011 COL/8/016
JIMENEZ BARRERO	1. Surface-water hydrology 2. Surface-water hydrology	BRA IAEA	Nov.87 - Feb.88 Mar.91 - May 91	3/00 2/28	COL/8/012 COL/8/018

COLOMBIAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1983 - 1993
(As of mid-April 1993)

Name	Field of study	Host country	Date	Duration	Project
LUCERO BURGOS	1. Nuclear medicine 2. Nuclear instrumentation	SPA HUN IAEA	Jun.87 - Jul.87 Sep.89 - Oct.89	0/26 1/10	COL/4/007 COL/4/007
MONTOYA GONZALEZ	1. Radiological protection 2. Radiation protection	ECU ECU	Oct.84 Feb.85 - Mar.85	0/12 0/05	RLA/0/006 RLA/0/006
QUINTERO LONDONO	1. Radiation protection 2. Nuclear safety	VEN ARG	Oct.85 - Nov.85 Mar.87 - Mar.88	0/05 12/01	RLA/0/006 COL/1/005
RUIZ CARRIZOSA	1. Medical instrumentation 2. Medical physics	SPA USA	Jan.87 - May 87 May 91	4/01 1/00	COL/4/007 COL/4/007
TORRES JAIMES	1. Radiopharmacy 2. Nuclear medicine	ARG CHI	Mar.90 - Jun.90 Aug.92 - Oct.92	3/05 2/01	COL/2/010 RLA/6/016
TORRES QUINTERO	1. Isotope hydrology 2. Surface-water hydrology 3. Use of artificial tracers in surface hydrology	SPA BRA BRA	May 82 - Jul.83 May 88 May 90 - Jun.90	14/01 0/19 1/01	COL/8/009 COL/8/012 COL/8/014

AGENCY TRAINING COURSES WITH COLOMBIAN PARTICIPATION

1983 - 1993
(As of mid-April 1993)

Field	Number of participants	Number of courses
General atomic energy development	12	10
Nuclear physics	11	9
Nuclear chemistry	14	12
Nuclear raw materials	5	3
Nuclear engineering and technology	43	41
Nuclear techniques in agriculture	21	17
Nuclear medicine	24	15
Nuclear techniques in biology	2	2
Nuclear techniques in industry & hydrology	77	74
Nuclear safety	37	28
TOTAL	246	211

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
ANDRADE LONDONO	INT/4/096 (001)	ITC on interfacing in nuclear experiments	1988	DOM
	RLA/4/006 (004)	RTC on multichannel analysers and interfacing	1986	BRA
	RLA/4/006 (010)	RWS on computer interfacing and the design and construction of a pneumatic transfer system and its computer control	1987	PER
	RLA/4/006 (015)	RWS on local area networks and their application in data transfer in nuclear experiments	1988	URU
BARRETO OLMOS	INT/9/050 (001)	ITC on radiological protection and nuclear safety	1984	ARG
	RLA/1/008 (001)	Regional practical course on of physical dosimetry in radiotherapy for Latin American physicists	1988	USA
	RLA/8/013 (058)	RWS on radiation protection for radiographers	1990	ARG
	RLA/8/016 (001)	RTC on safety operation of radiation facilities - regulatory responsibilities	1992	ECU
	RLA/9/009 (008)	RTC on quality control of diagnostic X-ray equipment	1988	BRA
	RLA/9/009 (041)	RTC on clinical and radiation protection dosimetry	1989	BRA
	RLA/9/011 (002)	RTC on safe operation of industrial radiation facilities	1991	MEX
	RLA/9/011 (004)	RTC on thermoluminescence applied to dosimetry	1991	ECU
BRICENO DONDERIS DE MONROY	RLA/0/009 (002)	First RWS on nuclear information	1988	BRA
	RLA/0/009 (006)	Third RWS on nuclear information	1991	ECU
CARDENAS COLLAZOS	INT/1/034 (001)	ITC on basic and applied nuclear physics	1985	ITA
	INT/9/099 (001)	ITC on management of radioactive wastes with regard to radioisotope applications	1989	GFR
CARDONA GRANADOS	RLA/8/005 (150)	Regional seminar on non-destructive testing in petroleum refinery	1985	VEN
	RLA/8/013 (005)	Regional informative course on non-destructive testing in composite materials	1988	PER
CASTELLANOS LOPEZ	RLA/9/009 (047)	RTC on radiation protection in medical applications of ionizing radiation	1990	CUB
	RLA/9/011 (010)	RTC on clinical dosimetry and radiological protection	1993	MEX

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
CASTIBLANCO BOHORQUEZ	RLA/4/005 (001)	Regional theoretical and practical training course on nuclear reactors for beginners	1984	MEX
	RLA/4/007 (004)	RTC on measurement of basic parameters of research reactors	1988	CHI
	RLA/4/007 (007)	RTC on small computers in research reactor operation and use	1989	MEX
	RLA/4/007 (010)	RTC on burnup determination of research reactor fuels	1990	MEX
	RLA/9/012 (001)	RTC on regulatory aspects and safety documentation of research reactors	1991	CHI
CHAVEZ ROLDAN	RLA/8/005 (115)	Regional Working Group Meeting V	1985	MEX
	RLA/8/005 (116)	Regional Working Group Meeting VI	1985	GUA
	RLA/8/005 (200)	Regional Working Group Meeting VIII	1987	BOL
	RLA/8/005 (232)	Regional Working Group Meeting IX	1988	PER
	RLA/8/005 (233)	Regional II Congress on NDT	1988	PER
	RLA/8/006 (015)	International WS on implementation and implications of ISO international standard	1988	GUA
	RLA/8/013 (026)	Regional Working Group Meeting	1989	COS
CONCHA PERDOMO	INT/0/054 (001)	ITC on integrated energy and electricity planning for nuclear power development with emphasis on the ENPEP package	1992	USA
	INT/4/074 (001)	IWS on the conversion of research reactors to low-enrichment uranium fuels	1985	VEN
	RLA/4/007 (001)	RTC on the application of computers to reactor calculations	1986	ARG
	RLA/4/007 (008)	RWS to compare benchmark calculations	1989	CHI
	RLA/4/007 (009)	RTC on application of computer codes to calculations related to research reactors	1989	ARG
CUBILLOS MORENO	INT/4/092 (001)	ITC on the application of small computers to research reactor operations	1987	YUG
	RLA/4/007 (012)	RWS on safety analysis report and associated computer calculations for research reactors	1990	ARG
DE LA HOZ RUDAS	INT/4/085 (001)	ITC on advanced nuclear electronics	1986	JAM
	RLA/4/006 (008)	Regional seminar on recent advances in nuclear data acquisition and analysis systems	1987	GUA
	RLA/4/008 (007)	RWS on nuclear instruments in industry and their electronics	1992	CHI

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
ESPINOSA ARIAS	RLA/2/003 (001)	RTC on advanced fluorescence analysis	1986	PAR
	RLA/4/006 (001)	RWS on FORTRAN programming for nuclear applications	1986	PER
	RLA/4/006 (009)	RWS on small computer software for projects in nuclear laboratories: "Development of integrated software"	1987	AUS
ESPINOSA GUERRERO	INT/4/065 (001)	ITC on advanced research reactor utilization	1983	HUN
	RLA/4/007 (003)	RTC on water treatment and conditioning of research reactors	1988	PER
GARCIA SANCHEZ	RLA/0/009 (005)	Third RTC for librarians and information specialists in nuclear science and technology	1990	GUA
	RLA/0/009 (007)	RTC for librarians and information specialists in INIS procedures	1991	PER
	RLA/0/010 (001)	RTC for librarians and information specialists in nuclear science and technology	1987	CHI
GARCIA TORRES	INT/9/114 (001)	ITC on planning, preparedness and response to radiological emergencies	1991	USA
	RLA/9/015 (001)	RTC on safety and regulation of radiation sources	1993	MEX
GIRALDO CALDERON	RLA/8/005 (192)	Regional seminar on non-destructive testing of vibrations	1987	ARG
	RLA/8/005 (237)	National informative study tour on vibrations	1988	GFR
	RLA/8/013 (025)	RTC on vibration monitoring in rotating machinery	1989	MEX
GOMEZ GOMEZ	INT/1/030 (001)	ITC on energy dispersive X-ray analysis	1984	YUG
	RLA/0/008 (001)	RWS on IAEA technical co-operation practices and procedures	1985	CHI
	RLA/2/003 (007)	Second RWS on nuclear analytical techniques	1990	ARG
	RLA/2/003 (010)	RWS on nuclear analytical techniques and quality assurance	1990	ARG
HIGUERA ROBLES	RLA/6/011 (020)	Second RTC on the preparation and use of regional (local) bulk reagents for RIA of thyroid-related hormones	1989	BRA
	RLA/6/016 (005)	RWS on data processing and external quality assessment in RIA	1992	PAR

MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
 BY COLOMBIAN NATIONALS
 1983 - 1993
 (As of mid-April 1993)

Name	Course No.	Course title	Year	Location
LUCERO BURGOS	INT/4/064 (001)	ITC on advanced nuclear electronics	1983	AUS
	RLA/4/006 (005)	RWS on nuclear instrumentation	1986	GER
	RLA/4/006 (013)	RTC on high-resolution radiation detectors	1988	BRA ARG
MEJIA SANCHEZ	RLA/4/006 (006)	RTC on design, construction and testing of research reactor instrumentation	1987	PER
	RLA/4/006 (014)	RWS on design and construction of an X-ray spectrometer	1988	ECU
	RLA/4/006 (017)	RTC on advanced aspects of nuclear spectroscopy	1989	PAR
MELENDREZ CORDOBA	RLA/8/005 (196)	RTC on eddy currents (level II)	1987	CHI
	RLA/8/005 (223)	Regional informative course on eddy current testing in boiler-tube inspection	1988	CHI
	RLA/8/013 (072)	RWS on underwater inspection	1990	BRA
MENDOZA DE GARCIA	RLA/5/019 (001)	RTC on RIA and enzyme assay for the determination of hormones, metabolites and antibodies in animal production and health	1986	CUB
	RLA/6/011 (019)	RWS on external quality control	1989	PAR
	RLA/6/014 (001)	RTC on preparation and control of radiopharmaceuticals	1989	CHI
MONTANEZ NINO	RLA/8/005 (083)	RTC on non-destructive testing on eddy currents (level II)	1985	ARG
	RLA/8/013 (095)	Regional seminar on hydroelectric plant maintenance	1990	PAR
MONTOYA GONZALEZ	INT/9/053 (001)	ITC on safety of nuclear power plants and fuel cycle installations	1984	FRA
	INT/9/069 (001)	ITC on radiation protection in the mining and milling of radioactive ores	1986	BRA
	RLA/9/009 (001)	RWS on radiation protection	1986	CHI
	RLA/9/009 (042)	Fifth RWS on radiation protection	1989	BRA
MORALES FERNANDEZ	RLA/8/013 (001)	Regional informative course on computers in non-destructive testing	1988	ARG
	RLA/8/017 (016)	RWS on non-destructive testing for quality	1992	CHI

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
MORENO MACHADO	RLA/5/020 (002)	RTC on food irradiation technology	1987	ARG
	RLA/8/016 (001)	RTC on safe operation of radiation facilities - regulatory responsibilities	1992	ECU
PEREZ GOMEZ	RLA/8/005 (128)	RTC on surface methods (level II)	1986	GUA
	RLA/8/006 (009)	RTC on ultrasonics (level II)	1985	ARG
PINEDA REY	INT/1/032 (001)	ITC on solid state nuclear track detectors and their application	1985	GFR
	INT/4/100 (001)	ITC on interfacing in nuclear experiments	1989	THA
QUINTERO LONDONO	INT/1/029 (001)	ITC on dosimetry	1984	BRA
	RLA/9/009 (002)	RWS on calibration procedures in dosimetry	1986	ECU
	RLA/9/009 (012)	Regional seminar on quality control in radiotherapy	1988	PER
	RLA/9/009 (041)	RTC on clinical and radiation protection dosimetry	1989	BRA
	RLA/9/010 (001)	RTC on safety and regulation of radiation sources	1991	MEX
RAMIREZ RAMIREZ	INT/9/082 (001)	ITC on radiological protection and nuclear safety	1987	ARG
	RLA/9/011 (001)	RTC on radiological emergencies	1991	PER
	RLA/9/011 (009)	RWS on co-ordinated studies in intercomparison of low-energy personnel dosimetry	1992	BRA
RODON BUSTOS	RLA/8/005 (148)	Regional seminar on non-destructive testing in concrete structures	1985	ARG
	RLA/8/006 (013)	RTC on materials and processes	1987	MEX
	RLA/8/013 (110)	International workshop on project achievements	1991	GFR
RONDON BAEZ	INT/3/012 (001)	ITC on uranium processing	1983	SPA
	INT/5/117 (001)	ITC on the use of isotopes and radiation techniques in studies on soil/plant relationships	1989	AUS
	RLA/1/009 (001)	RTC on the use of isotope techniques in environmental studies of the hydrosphere and atmosphere	1992	BRA

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
RUIZ CARRIZOSA	INT/4/098 (001) RLA/4/006 (019)	Advanced ITC on nuclear electronics RTC on maintenance of industrial nuclear equipment	1989 1990	USA MEX
SANCHEZ DE ESTRADA	RLA/6/008 (001) RLA/6/010 (001)	Regional train-the-trainers course on radioimmunoassay Regional train-the-trainers course on data processing in radioimmunoassay	1984 1985	MEX ARG
SANCHEZ MUNOZ	INT/0/054 (001) INT/8/023 (001)	ITC on integrated energy and electricity planning for nuclear power development with emphasis on the ENPEP package ITC on the application of isotopes in hydrology	1992 1983	USA AUS
SEGURO VARGAS	RLA/8/006 (008) RLA/8/013 (024) RLA/8/013 (061)	RTC on surface methods (level III) RTC on real-time radiography RTC on inspection of LPG cylinders	1985 1989 1990	BRA BRA PER
TORRES BOHORQUEZ	RLA/8/005 (087) RLA/8/013 (109)	Regional train-the-trainers course on ultrasonics RWS on criteria for conception and management of test pieces for qualification and certification of NDT personnel	1985 1991	CAN CHI
TORRES JAIMES	RLA/2/002 (001) RLA/6/016 (001)	RTC on the production and control of radiopharmaceuticals RTC on optimization of radioimmunoassay methodology for neonatal hypothyroid screening	1983 1991	URU BOL

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)**

Name	Course No.	Course title	Year	Location
TORRES MEDINA	RLA/8/005 (088)	Regional study tour for RWG members	1985	CAN
	RLA/8/005 (113)	Regional seminar on NDT in steel industry	1985	MEX
	RLA/8/005 (194)	Regional seminar on high-energy RT	1987	ECU
	RLA/8/013 (002)	RWS on qualification and certification	1988	BRA
	RLA/8/013 (003)	RWS on preparation of test specimens	1988	BRA
	RLA/8/013 (009)	International 12th World Conference on NDT	1989	NET
	RLA/8/013 (010)	International workshop on project achievements	1989	GFR
	RLA/8/013 (011)	Regional seminar on NDT advanced techniques	1989	GFR
	RLA/8/013 (012)	Regional seminar on NDT advanced techniques	1989	ITA
	RLA/8/013 (056)	RWS on quality assessment	1990	BRA
	RLA/8/017 (001)	RWS on industrial quality in production and maintenance	1991	BRA
	RLA/8/017 (013)	Regional working group meeting on quality engineering	1992	ARG
TORRES REYES	RLA/6/011 (028)	RTC on optimization of the production and preparation of bulk reagents with present methodology	1990	CUB
	RLA/6/012 (001)	RTC on promotion and use of bulk reagents for radioimmunoassay of thyroid-related hormones	1988	CHI
VALDEZ OSORIO	RLA/4/006 (007)	RWS on repair of nuclear instrument module (NIM)	1987	URU
	RLA/4/006 (011)	RTC for technicians on maintenance and electromechanical problems of nuclear and related instruments in medicine	1988	COS
	RLA/4/006 (018)	RTC on design and production of printing boards	1989	CUB
	RLA/4/006 (022)	RTC on maintenance of power supplies in nuclear instruments	1990	GUA
VALENCIA	RLA/8/005 (087)	Regional train-the-trainers course on ultrasonics	1985	CAN
	RLA/8/013 (021)	RTC on tomography	1989	URU
VARGAS CARMONA	RLA/8/005 (144)	Regional seminar on non-destructive testing in fracture mechanics	1985	BRA
	RLA/8/013 (018)	RTC on acoustic emission	1989	ARG

MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY COLOMBIAN NATIONALS
1983 - 1993
(As of mid-April 1993)

Name	Course No.	Course title	Year	Location
VELEZ AGUDELO	INT/4/087 (001) INT/9/046 (001) RLA/7/004 (001)	ITC on radiation technology and engineering ITC on radiological protection and nuclear safety RTC on new approaches in radiation sterilization of medical supplies	1986 1983 1991	HUN ARG ARG
ZAPATA GONZALES	INT/3/012 (001) INT/3/013 (001)	ITC on uranium processing ITC on uranium prospection and processing	1983 1984	SPA FRA
ZULETA AGUIRRE	INT/8/024 (001) RLA/5/020 (001) RLA/9/011 (002)	Interregional study tour on radiation techniques in industry RWS on food irradiation RTC on safe operation of industrial radiation facilities	1984 1986 1991	CZE FRA GDR HUN USSR BRA MEX
ZULOAGA MOYA	RLA/1/003 (001) RLA/2/003 (014)	RTC on radiochemistry and nuclear analytical techniques RTC on application of FIA in studies of environmental and geological samples	1984 1992	ECU BRA

PROJECTS COMPLETED IN COLOMBIA SINCE 1983
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1981	COL/0/004	Geological data processing	2/00	10 800	57 000	-	1/18	14 688	55 535	-	1984
1982	COL/0/006	Nuclear power planning	2/00	10 800	-	-	1/22	8 931	-	-	1983
1983	COL/0/007	Nuclear centre development	1/00	5 500	-	-	0/21	5 792	-	-	1983
1980	COL/1/004	Cryogenic services	-	-	68 317	-	-	-	68 357	-	1988
1981	COL/1/005	Secondary standards dosimetry laboratory	5/01	28 435	344 738	-	4/29	25 074	344 040	-	1989
1989	COL/1/006	Neutron activation analysis (phase II)	1/00	8 850	28 785	15 880	1/00	8 450	27 765	8 199	1991
1985	COL/2/009	X-ray fluorescence analysis	5/16	39 495	112 020	2 600	5/22	36 832	112 444	2 942	1992
1986	COL/2/010	Radiopharmaceutical kit production and quality control	4/03	29 600	48 192	5 430	4/03	28 952	48 191	4 928	1990
1978	COL/3/004	Prospection for radioactive minerals	89/21	530 268	892 267	29 712	89/21	530 268	892 267	29 712	1983

PROJECTS COMPLETED IN COLOMBIA SINCE 1983
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1982	COL/3/006	Pilot-scale uranium extraction	2/00	10 800	-	-	2/01	12 065	-	-	1983
1986	COL/3/008	Neutron activation analysis	-	-	22 650	-	-	-	22 649	-	1991
1986	COL/3/009	Nuclear raw materials	4/00	27 900	-	-	4/08	29 700	-	-	1088
1984	COL/4/006	Research reactor conversion	8/03	56 365	91 259	-	8/03	62 778	91 470	-	1989
1984	COL/4/007	Nuclear instrumentation	4/07	29 430	71 514	12 937	4/07	28 577	71 514	12 564	1991
1988	COL/4/008	Upgrading of research reactor	-	-	50 000	-	-	-	50 000	-	1989
1989	COL/4/009	Upgrading of research reactor instrumentation	1/00	8 400	336 184	-	1/03	11 618	336 184	-	1992
1981	COL/5/005	Irradiated vaccines against parasites	4/28	28 660	90 524	-	4/27	41 776	89 652	-	1987
1983	COL/5/006	Assessment of micro-nutrient status of crop plants and soils	4/00	24 800	12 000	-	4/04	24 557	12 407	-	1985

PROJECTS COMPLETED IN COLOMBIA SINCE 1983
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1983	COL/5/007	Studies on nitrogen fertilizer use efficiency	10/23	71 490	171 346	6 794	10/23	69 293	174 762	6 794	1987
1986	COL/5/008	Radiation-induced mutation breeding	4/12	31 660	62 480	28 353	4/16	34 667	63 526	28 456	1991
1987	COL/5/009	Symbiotic nitrogen fixation	1/00	7 050	28 100	-	1/01	7 874	20 265	-	1988
1988	COL/5/010	Nuclear techniques in soil science studies	3/13	28 530	100 580	20 502	3/13	25 564	100 237	20 668	1991
1988	COL/5/011	Training in mediterranean fruit fly control	1/00	7 200	-	-	0/29	7 190	-	-	1989
1989	COL/6/004	National immunoassay training programme	1/22	14 040	40 400	-	1/24	14 345	40 388	-	1991
1989	COL/6/005	Application of DNA probes for diagnosis of malaria	-	-	61 795	54 504	-	-	61 189	43 893	1992
1981	COL/8/010	Isotopes in hydrology	4/15	26 422	212 358	-	4/25	26 198	212 358	-	1988
1985	COL/8/011	Establishment of a gamma facility	1/00	6 930	5 262	-	1/03	15 495	2 656	-	1990

**PROJECTS COMPLETED IN COLOMBIA SINCE 1983
(As of mid-April 1993)**

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1986	COL/8/012	Isotope-aided sedimentology studies	3/09	23 385	105 943	9 000	3/09	27 162	106 456	12 177	1989
1989	COL/8/014	Dispersion coefficients in the Magdalena river	3/11	27 860	26 280	21 300	3/11	19 305	26 563	20 691	1991
1989	COL/8/015	Evaluation of the San Andres aquifers	0/29	7 980	39 945	-	0/29	14 060	39 981	-	1992
1988	COL/9/002	Radiation protection	1/27	13 586	58 559	15 400	1/27	13 586	58 783	16 183	1991
1989	COL/9/003	Radiation protection monitoring	1/12	11 790	59 042	10 933	1/12	13 908	58 038	10 933	1992
	TOTAL	32 projects	117/12	1 128 026	3 197 540	233 345	177/21	1 158 705	3 187 677	218 140	

OPERATIONAL PROJECTS IN COLOMBIA
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1993	COL/0/008	Energy planning with reference to a nuclear option	4/00	42 300	15 000	-	0/06	6 351	-	-
1991	COL/1/007	Secondary standards dosimetry laboratory (phase II)	0/27	8 370	148 540	-	0/27	5 180	107 132	-
1986	CO/2/011	Emission spectrometry	2/00	14 100	73 704	10 000	2/02	13 496	73 953	9 924
1991	COL/2/012	Technetium-99m radiopharmaceuticals	5/00	48 150	104 000	-	1/20	15 698	54 887	-
1993	COL/2/013	Manpower training in radiochemistry	4/00	42 750	40 000	12 450	-	-	-	-
1991	COL/4/010	Nuclear instrumentation metrology	1/01	9 145	66 987	6 667	1/01	11 490	61 559	6 667
1991	COL/4/011	Upgrading of research reactor instrumentation (phase II)	3/08	30 830	157 318	5 820	1/23	21 904	132 385	3 750
1993	COL/4/012	Core conversion and upgrading of research reactor IAN-RI (phase II)	3/00	31 950	562 214	12 000	0/03	-	-	-

OPERATIONAL PROJECTS IN COLOMBIA
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1993	COL/4/013	Modernization of research reactor IAN-RI	2/00	22 800	150 000	-	-	-	-	-
1989	COL/5/012	Radioimmunoassay techniques in animal reproduction	3/14	31 895	61 670	-	2/17	24 990	54 097	-
1991	COL/5/013	Radiation induced mutation breeding (phase II)	1/05	10 400	23 000	-	1/10	22 800	22 784	-
1991	COL/5/014	Immunoassay in livestock diseases diagnosis	2/14	23 990	27 980	-	2/03	25 675	22 699	-
1993	COL/5/015	Mutation breeding in bananas and plantains	2/00	21 150	70 000	61 900	0/03	-	-	4 714
1993	COL/6/006	Brachytherapy	1/00	11 400	175 000	-	-	-	-	-
1989	COL/8/013	Establishment of a gamma facility (phase II)	1/06	10 610	184 357	12 800	0/29	8 090	24 291	11 738
1990	COL/8/016	Use of radioisotopes in industry	0/09	2 520	170 608	18 000	0/09	2 384	31 277	17 998
1991	COL/8/017	Evaluation of groundwater resources	2/00	18 150	26 025	-	1/24	20 444	24 149	-

OPERATIONAL PROJECTS IN COLOMBIA
(As of mid-April 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1991	COL/8/018	Radioactive tracers in sedimentology	3/11	34 045	124 480	8 796	2/11	23 988	50 074	10 365
1993	COL/9/004	National programme of radiation protection	4/00	42 300	135 000	18 450	0/07	920	-	-
	TOTAL	19 projects	46/05	456 855	2 315 883	166 883	19/15	203 410	659 287	65 156

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

Project No. Institute Counterpart(s)

GENERAL ATOMIC ENERGY DEVELOPMENT

COL/0/004 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá ALUJA VENERO

COL/0/006 1. Institute of Nuclear Sciences and
Alternative Energies,
Bogotá LEON
2. Interconnexion Electrica S.A.,
Bogotá HERNANDEZ RAMIREZ

COL/0/007 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá VILLARREAL SILVA

COL/0/008 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá SANCHEZ MUNOZ

NUCLEAR CHEMISTRY AND PHYSICS

COL/1/004 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá GOMEZ GOMEZ

COL/1/005 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá MONTOYA GONZALEZ

COL/1/006 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá GOMEZ GOMEZ
PABON RIANO

COL/1/007 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá ZAMORA CAICEDO

COL/2/009 Institute of Nuclear Sciences and
Alternative Energies,
Bogotá ESPINOSA ARIAS
SANCHEZ SEGURA

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR PHYSICS AND CHEMISTRY (cont'd)</u>		
COL/2/010	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá	MENDOZA DE GARCIA GUTIERREZ DE GUTIERREZ
	2. University of Valle, Cali	DE BERNAL DE MILLAMIZAR
	3. National University of Colombia, Bogotá	SANCHEZ DE GOMEZ MATALLANA DE RODRIGUEZ
COL/2/011	Institute of Nuclear Sciences and Alternative Energies, Bogotá	ESPINOSA ARIAS
COL/2/012	Institute of Nuclear Sciences and Alternative Energies, Bogotá	MENDOZA DE GARCIA
COL/2/013	Institute of Nuclear Sciences and Alternative Energies, Bogotá	PABON RIANO
<u>NUCLEAR RAW MATERIALS</u>		
COL/3/004	Institute of Nuclear Sciences and Alternative Energies, Bogotá	VILLARREAL SILVA
COL/3/006	Institute of Nuclear Sciences and Alternative Energies, Bogotá	LOPEZ
COL/3/008	Institute of Nuclear Sciences and Alternative Energies, Bogotá	GOMEZ GOMEZ
COL/3/009	Institute of Nuclear Sciences and Alternative Energies, Bogotá	CORTES URAZAN

COUNTERPART INSTITUTIONS IN COLOMBIA (I)

(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR ENGINEERING AND TECHNOLOGY</u>		
COL/4/006	Institute of Nuclear Sciences and Alternative Energies, Bogotá	SPIN RAMIREZ
COL/4/007	Institute of Nuclear Sciences and Alternative Energies, Bogotá	LUCERO BURGOS
COL/4/008	Institute of Nuclear Sciences and Alternative Energies, Bogotá	SPIN RAMIREZ
COL/4/009	Institute of Nuclear Sciences and Alternative Energies, Bogotá	SPIN RAMIREZ CASTIBLANCO BOHORQUEZ
COL/4/010	Institute of Nuclear Sciences and Alternative Energies, Bogotá	DE LA HOZ RUDAS
COL/4/011	Institute of Nuclear Sciences and Alternative Energies, Bogotá	SPIN RAMIREZ CASTIBLANCO BOHORQUEZ
COL/4/012	Institute of Nuclear Sciences and Alternative Energies, Bogotá	CASTIBLANCO BOHORQUEZ SARTA FUENTES
COL/4/013	Institute of Nuclear Sciences and Alternative Energies, Bogotá	CASTIBLANCO BOHORQUEZ SARTA FUENTES
<u>AGRICULTURE</u>		
COL/5/005	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá	GIL PEDRAZA -

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>AGRICULTURE (cont'd)</u>		
COL/5/006	Institute of Nuclear Sciences and Alternative Energies, Bogotá	ALVAREZ FARACCO
COL/5/007	Institute of Nuclear Sciences and Alternative Energies, Bogotá	BASTIDAS ORTIZ
COL/5/008	1. Institute of Nuclear Sciences and Alternative Energies, 2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá	ALVAREZ FARACCO -
COL/5/009	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá	BASTIDAS ORTIZ OBANDO DIAZ MUNOZ BETANCOURT
COL/5/010	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá	BASTIDAS ORTIZ AMEZQUITA
COL/5/011	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. National University of Colombia, Faculty of Sciences, Department of Biology, Bogotá	- MUNOZ DE HOYOS
COL/5/012	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá 3. National University of Colombia, Bogotá	HIGUERA ROBLES RAMOS DUENAS AMAYA

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>AGRICULTURE</u> (cont'd)		
COL/5/013	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá	ALVAREZ FARACCO
	2. Colombian Agricultural and Livestock Breeding Institute, Villavicencio, Bogotá	DAVALOS ROJAS
	3. National University of Colombia, Bogotá	-
COL/5/014	Colombian Agricultural and Livestock Breeding Institute, Bogotá	MARINO JANNAUT
COL/5/015	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá	ALVAREZ FARACCO
	2. National University of Colombia, Bogotá	PEREA-DALLOS
<u>NUCLEAR MEDICINE</u>		
COL/6/004	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá	MENDOZA DE GARCIA
	2. National University of Colombia, Bogotá	SANCHEZ DE GOMEZ
	3. University of Valle, Cali	DE BERNAL]
COL/6/005	University of Valle, Faculty of Health, Microbiology Department, Cali	HERRERA VALENCIA
COL/6/006	National Cancer Institute, Radiotherapy Section, Bogotá	LLAMAS OLIER

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR TECHNIQUES IN INDUSTRY AND HYDROLOGY</u>		
COL/8/010	Institute of Nuclear Sciences and Alternative Energies, Bogotá	SANCHEZ RODRIGUEZ
COL/8/011	Institute of Nuclear Sciences and Alternative Energies, Bogotá	ZULETA AGUIRRE VELEZ AGUDELO
COL/8/012	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Ministry of Public Works, Directorate for Ports and Navigation, Bogotá	JIMENEZ BARRERO BENITEZ
COL/8/013	Institute of Nuclear Sciences and Alternative Energies, Bogotá	MORENO MACHADO VELEZ AGUDELO
COL/8/014	Institute of Nuclear Sciences and Alternative Energies, Bogotá	TORRES QUINTERO OBANDO GARNICA
COL/8/015	Institute of Nuclear Sciences and Alternative Energies, Bogotá	OBANDO GARNICA ALAYON CASTRO
COL/8/016	Institute of Nuclear Sciences and Alternative Energies, Bogotá	DUQUE OSPINA HERRERA RIVERA
COL/8/017	1. Institute of Nuclear Sciences and Alternative Energies, Bogotá 2. Corporación Autónoma Regional del Valle del Cauca, Cali 3. Universidad Pedagógica y Tecnológica de Colombia, Boyaca	OBANDO GARNICA JIMENEZ BARRERO TENJO BRAVO

COUNTERPART INSTITUTIONS IN COLOMBIA (I)
(By Project)

Project No. Institute Counterpart(s)

NUCLEAR APPLICATIONS IN INDUSTRY AND HYDROLOGY (cont'd)

COL/8/018	1.	Institute of Nuclear Sciences and Alternative Energies, Bogotá	JIMENEZ BARRERO OBANDO GARNICA
	2.	Ministry of Public Works, Directorate for Ports and Navigation, Bogotá	LOZANO
	3.	Empresa Puertos de Colombia, Colpuertos, Buenaventura	FERRER

NUCLEAR SAFETY

COL/9/002		Institute of Nuclear Sciences and Alternative Energies, Bogotá	PUERTA ORTIZ GARCIA TORRES
COL/9/003		Institute of Nuclear Sciences and Alternative Energies, Bogotá	CASTIBLANCO BOHORQUEZ
COL/9/004		Institute of Nuclear Sciences and Alternative Energies, Bogotá	ZAMORA CAICEDO

COUNTERPART INSTITUTIONS IN COLOMBIA (II)
(By Institute)

BOGOTA

Institute of Nuclear Sciences and Alternative Energies
Bogotá

COL/0/004	Geological Data Processing
COL/0/006	Nuclear Power Planning
COL/0/007	Nuclear Centre Development
COL/0/008	Energy Planning with Reference to a Nuclear Option
COL/1/004	Cryogenic Services
COL/1/005	Secondary Standards Dosimetry Laboratory
COL/1/006	Neutron Activation Analysis (Phase II)
COL/1/007	Secondary Standards Dosimetry Laboratory (Phase II)
COL/2/009	X-Ray Fluorescence Analysis
COL/2/010	Radiopharmaceutical Kit Production and Quality Control
COL/2/011	Emission Spectrometry
COL/2/012	Technetium-99m Radiopharmaceuticals
COL/2/013	Manpower Training in Radiochemistry
COL/3/004	Prospection for Radioactive Materials
COL/3/006	Pilot-Scale Uranium Extraction
COL/3/008	Neutron Activation Analysis
COL/3/009	Nuclear Raw Materials
COL/4/006	Research Reactor Conversion
COL/4/007	Nuclear Instrumentation
COL/4/008	Upgrading of Research Reactor
COL/4/009	Upgrading of Research Reactor Instrumentation
COL/4/010	Nuclear Instrumentation Metrology
COL/4/011	Upgrading of Research Reactor Instrumentation (Phase II)
COL/4/012	Core Conversion and Upgrading of Research Reactor (Phase II)
COL/4/013	Modernization of Research Reactor IAN-RI
COL/5/005	Irradiated Vaccines against Parasites
COL/5/006	Assessment of Micronutrient Status of Crop Plants and Soils
COL/5/007	Studies on Nitrogen Fertilizer Use Efficiency
COL/5/008	Radiation-Induced Mutation Breeding
COL/5/009	Symbiotic Nitrogen Fixation
COL/5/010	Nuclear Techniques in Soil Science Studies
COL/5/011	Training in Mediterranean Fruit Fly Control
COL/5/012	Radioimmunoassay Techniques in Animal Reproduction
COL/5/013	Radiation-Induced Mutation Breeding (Phase II)
COL/5/015	Mutation Breeding in Bananas and Plantains
COL/6/004	National Immunoassay Training Programme
COL/8/010	Isotopes in Hydrology
COL/8/011	Establishment of a Gamma Facility
COL/8/012	Isotope-Aided Sedimentology Studies
COL/8/013	Establishment of a Gamma Facility (Phase II)
COL/8/014	Dispersion Coefficients in the Magdalena River
COL/8/015	Evaluation of the San Andres Aquifers
COL/8/016	Use of Radioisotopes in Industry

COUNTERPART INSTITUTIONS IN COLOMBIA (II)
(By Institute)

BOGOTA (cont'd)

Institute of Nuclear Sciences and Alternative Energies
Bogotá

COL/8/017	Evaluation of Groundwater Resources
COL/8/018	Radioactive Tracers in Sedimentology
COL/9/002	Radiation Protection
COL/9/003	Radiation Protection Monitoring
COL/9/004	National Programme of Radiation Protection

Ministry of Public Works
Directorate for Ports and Navigation
Bogotá

COL/8/012	Isotope-Aided Sedimentology Studies
COL/8/018	Radioactive Tracers in Sedimentology

National University of Colombia
Bogotá

COL/2/010	Radiopharmaceutical Kit Production and Quality Control
COL/5/012	Radioimmunoassay Techniques in Animal Reproduction
COL/5/013	Radiation-Induced Mutation Breeding (Phase II)
COL/5/015	Mutation Breeding in Bananas and Plantains
COL/6/004	National Immunoassay Training Programme

National University of Colombia
Faculty of Sciences
Department of Biology
Bogotá

COL/5/011	Training in Mediterranean Fruit Fly Control
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Colombian Agricultural and Livestock Breeding Institute
Villavicienclo, Bogotá

COL/5/005	Irradiated Vaccines against Parasites
COL/5/008	Radiation-Induced Mutation Breeding
COL/5/009	Symbiotic Nitrogen Fixation
COL/5/010	Nuclear Techniques in Soil Science Studies
COL/5/011	Training in Mediterranean Fruit Fly Control
COL/5/012	Radioimmunoassay Techniques in Animal Reproduction
COL/5/013	Radiation-Induced Mutation Breeding (Phase II)
COL/5/014	Immunoassay in Livestock Diseases Diagnosis

COUNTERPART INSTITUTIONS IN COLOMBIA (II)
(By Institute)

BOGOTA (cont'd)

Interconnexion Electrica S.A.
Bogotá

COL/0/006 Nuclear Power Planning

National Cancer Institute
Radiotherapy Section
Bogotá

COL/6/006 Brachytherapy

CALI

University of Valle
Call

COL/2/010 Radiopharmaceutical Kit Production and Quality Control
COL/6/004 National Immunoassay Training Programme

University of Valle
Faculty of Health
Microbiology Department
Call

COL/6/005 Application of DNA Probes for Diagnosis of Malaria

Corporación Autónoma Regional del Valle del Cauca
Call

COL/8/017 Evaluation of Groundwater Resources

BOYACA

Universidad Pedagógica y Tecnológica de Colombia
Boyaca

COL/8/017 Evaluation of Groundwater Resources

COUNTERPART INSTITUTIONS IN COLOMBIA (II)
(By Institute)

BUENAVENTURA

Empresa Puertos de Colombia
Colpuertos, Buenaventura

COL/8/018 Radioactive Tracers in Sedimentology

**THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH
COLOMBIA
SINCE 1983**

LONG-TERM EXPERT ASSIGNMENTS

NONE

RESEARCH CONTRACTS/AGREEMENTS IN COLOMBIA SINCE 1983 ¹
(As of mid-April 1993)

Field of activity	No. of contracts/ agreements	Amount allocated \$
Nuclear physics	1	8 500
Nuclear chemistry	2	4 000
Nuclear engineering and technology	4	42 500
Nuclear techniques in agriculture	15	98 300
Nuclear medicine	8	53 800
Nuclear techniques in biology	1	10 000
Nuclear techniques in industry & hydrology	4	45 000
TOTAL	35	262 100

¹/ New awards since 1983

**SCIENTISTS FROM COLOMBIA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS OR
TRAINING COURSE LECTURERS
1983 - 1993
(As of mid-April 1993)**

Name	No. of assignments	Project(s)
AHUMADA	3	COL/9/004, RLA/0/006
AMESQUITA	1	RLA/8/005
BASTIDAS ORTIZ	1	COL/5/007
BOLIVAR GRIMALDOS	1	RLA/8/005
BRICENO DONDERIS DE M.	4	RLA/0/009
CASTANEDA	2	RLA/8/017
CASTIBLANCO BOHORQUEZ	1	RLA/4/007
CHAMORRO	1	RLA/8/005
CHAVEZ ROLDAN	6	RLA/8/005, RLA/8/006, RLA/8/013
DAVALOS ROJAS	1	RLA/5/021
DE BRICENO ORDUZ	3	COS/3/003, COS/3/004, PAN/3/002
DE LA HOZ RUDAS	1	RLA/4/008
ESPINOSA ARIAS	3	INT/0/040, RLA/2/003, RLA/4/006
FORERO SANCHEZ	1	RLA/8/005
GARCIA TORRES	1	RLA/9/011
GIL PEDRAZA	1	RLA/5/017
GONZALEZ VARELA	1	RLA/4/007
JARAMILLO	1	RLA/8/005
JURADO	2	RLA/8/005
LUCERO BURGOS	8	BOL/4/005, INT/4/054, RLA/0/006, RLA/4/006, RLA/4/008
MARINO JANNAUT	3	ECU/5/011, NIC/5/004
MENDOZA DE GARCIA	3	PER/4/011, RLA/6/011
MOGOLLON	1	RLA/8/005

**SCIENTISTS FROM COLOMBIA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS OR
TRAINING COURSE LECTURERS
1983 - 1993
(As of mid-April 1993)**

Name	No. of assignments	Project(s)
MOLINA	1	RLA/8/005
MONTOYA GONZALEZ	3	RLA/0/006, RLA/9/009
OBANDO GARNICA	1	RLA/8/014
OCAMPO OCAMPO	1	RLA/0/009
PARDO TURRIAGO	1	RLA/4/007
PEREA-DALLOS	4	COS/5/009, RLA/5/021
RAMIREZ RAMIREZ	1	RLA/9/011
RODRIGUEZ NAVARRETE	3	COL/8/010, RLA/8/014
RUIZ CARRIZOSA	1	RLA/4/006
TAFURT	1	BOL/6/011
TALERO	1	RLA/8/013
TORRES BHORQUEZ	2	RLA/8/005, RLA/8/006
TORRES MEDINA	7	RLA/8/005, RLA/8/006, RLA/8/013
VELEZ AGUDELO	1	RLA/8/016
VILLARREAL SILVA	3	RLA/0/006
ZAMBRANO	1	RLA/8/005
TOTAL	82	

**AGENCY FELLOWSHIPS AND SCIENTIFIC VISITS
HOSTED BY COLOMBIA
1983 - 1993
(As of mid-April 1993)**

Recipient country	No. of fellowships	No. of scientific visits	TOTAL ¹
BOLIVIA	1	-	1
COSTA RICA	1	1	2
DOMINICAN REPUBLIC	1	1	2
ECUADOR	3	5	8
EL SALVADOR	1	-	1
GUATEMALA	1	1	2
NICARAGUA	1	-	1
PANAMA	1	1	2
PERU	4	-	4
ROMANIA	1	-	1
URUGUAY	1	1	2
VENEZUELA	2	-	2
TOTAL	18	10	28

1./ Includes trainees who have completed or at least started their studies.

**REGIONAL AND INTERREGIONAL TRAINING EVENTS
HOSTED BY COLOMBIA
1983 - 1993
(As of mid-April 1993)**

Course No.	Course Title	Partici- pants	Year
RLA/0/009 (003)	Second RTC for librarians and information specialists in nuclear science and technology	12	1988
RLA/2/003 (003)	RWS on applications of neutron activation analysis in environmental studies	10	1990
RLA/2/003 (004)	First RWS on nuclear analytical techniques	11	1989
RLA/2/007 (002)	RWS on production and control of radiopharmaceutical kits	10	1992
RLA/4/006 (002)	RWS on design, mounting and maintenance of modular nuclear instrumentation	6	1986
RLA/4/006 (016)	RTC on maintenance of radiation protection equipment	10	1989
RLA/4/006 (021)	RWS on maintenance of gamma cameras	10	1990
RLA/4/008 (001)	RWS on the preparation of national training courses in nuclear medical equipment maintenance	3	1991
RLA/5/021 (002)	RWS on improvement of rice and other cereals through mutation breeding	10	1988
RLA/5/028 (002)	RTC on animal health	24	1992
RLA/8/005 (085)	RTC on ultrasonics (level III)	8	1985

**REGIONAL AND INTERREGIONAL TRAINING EVENTS
HOSTED BY COLOMBIA
1983 - 1993
(As of mid-April 1993)**

Course No.	Course Title	Partici- pants	Year
RLA/8/006 (001)	RTC on industrial radiography (level III)	7	1984
RLA/8/006 (012)	RTC on radiography (level III)	12	1986
RLA/9/009 (010)	RWS IV on radiation protection	10	1988
RLA/9/011 (003)	RWS on co-ordinated research work on disposal of medical and industrial radiation sources	6	1991
	TOTAL	149	