



INTERNATIONAL ATOMIC ENERGY AGENCY



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COUNTRY PROGRAMME SUMMARY

THE AGENCY'S TECHNICAL CO-OPERATION

PROGRAMME WITH

GUATEMALA

1985 - 1995

COUNTRY PROGRAMME SUMMARIES

DEPARTMENT OF TECHNICAL CO-OPERATION

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EVALUATION SECTION

DEPARTMENT OF TECHNICAL CO-OPERATION

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PROGRAMME WITH

GUATEMALA

1985 - 1995

COUNTRY PROGRAMME SUMMARIES

This report contains a review of the Agency's technical co-operation activities in Guatemala carried out during 1985 - 1995. 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.

GUATEMALA

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INTRODUCTION

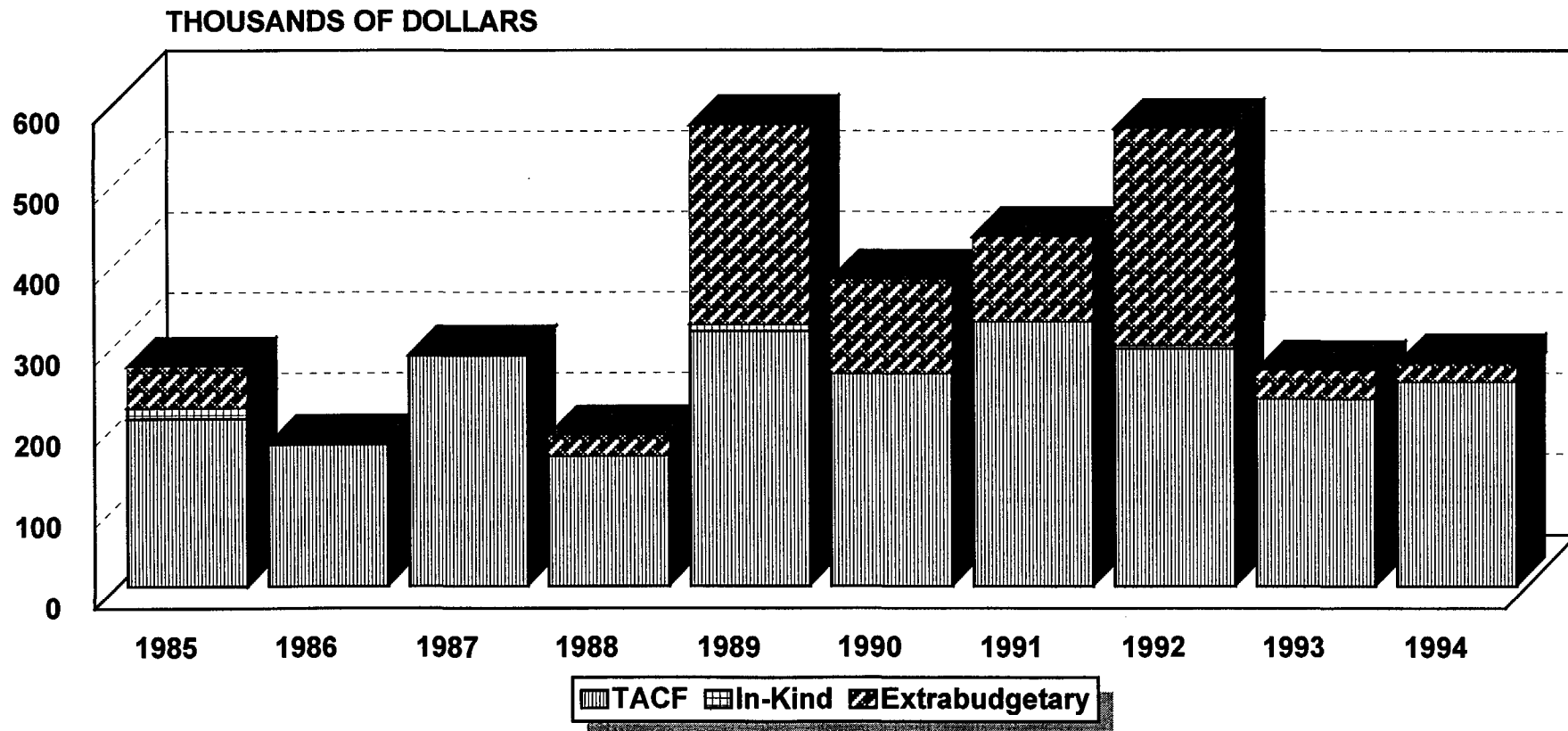
The country programme summary reported on here is one in the series of such studies being undertaken of the Agency's TC programme with Member States. With over \$4.1 million of Agency support received, Guatemala ranks 45th among all recipients of technical assistance during the period 1958 through 1994.

Over two-thirds of the assistance received over the past ten years was provided in the form of equipment (69%), complemented by training (17%) and expert services (14%). The major part of the resources was made available through the Technical Co-operation Fund (74%), the rest was provided through extrabudgetary contributions (25%) and through assistance in kind (1%).

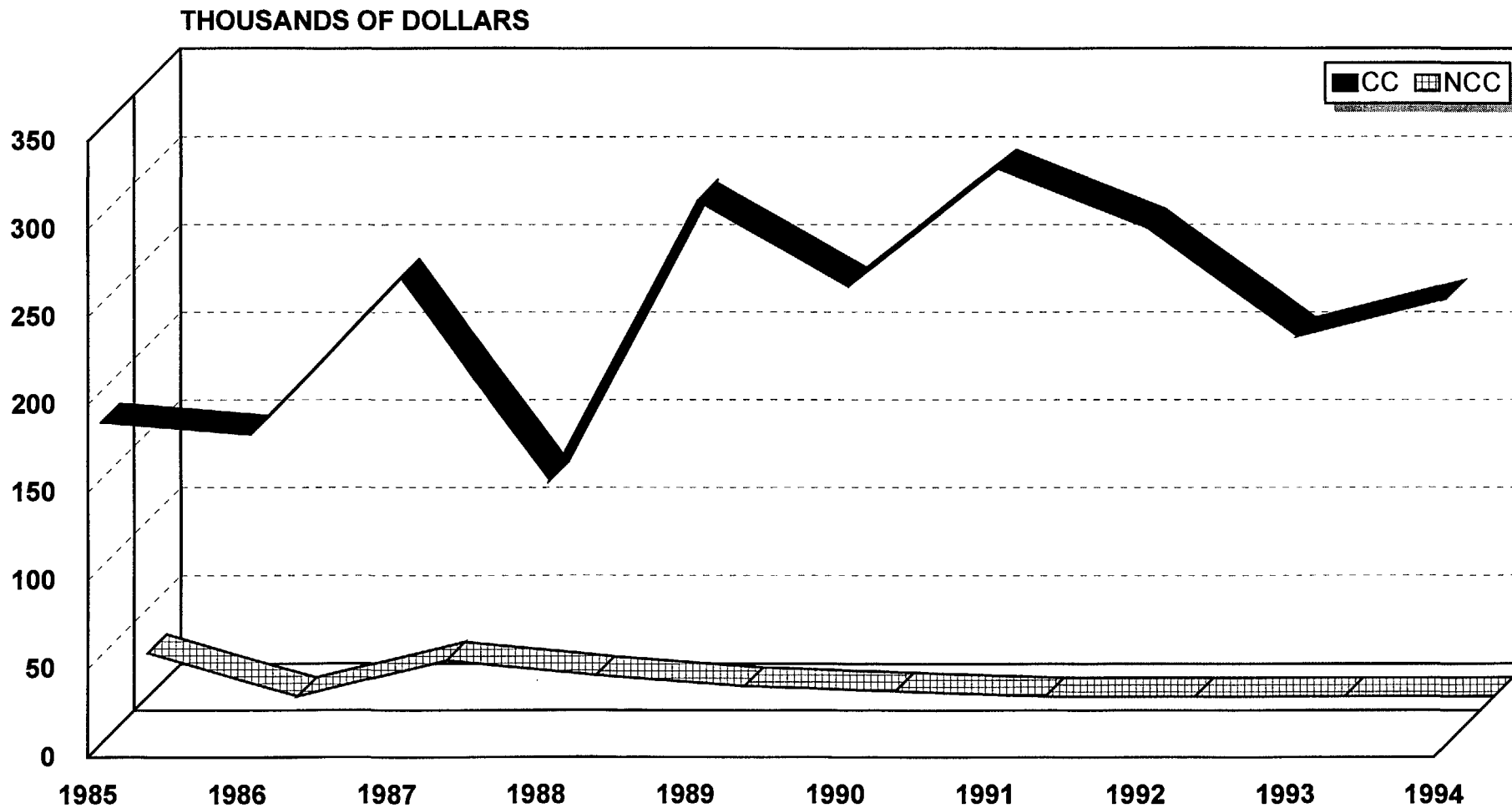
The three major areas of assistance during the past ten years were nuclear physics and chemistry (34%), agriculture (28%) and nuclear medicine (21%). Considerably smaller shares went to industry and hydrology (8%), nuclear safety, nuclear raw materials, and nuclear engineering and technology (3% each).

Since 1985, scientists from Guatemala have completed 73 assignments as Agency experts and training course lecturers or as participants in research co-ordination meetings. During the same period, Guatemala has hosted 52 fellowships and scientific visits, as well as twelve regional training courses for a total of 127 participants, and one national training course which was also attended by one outside participant.

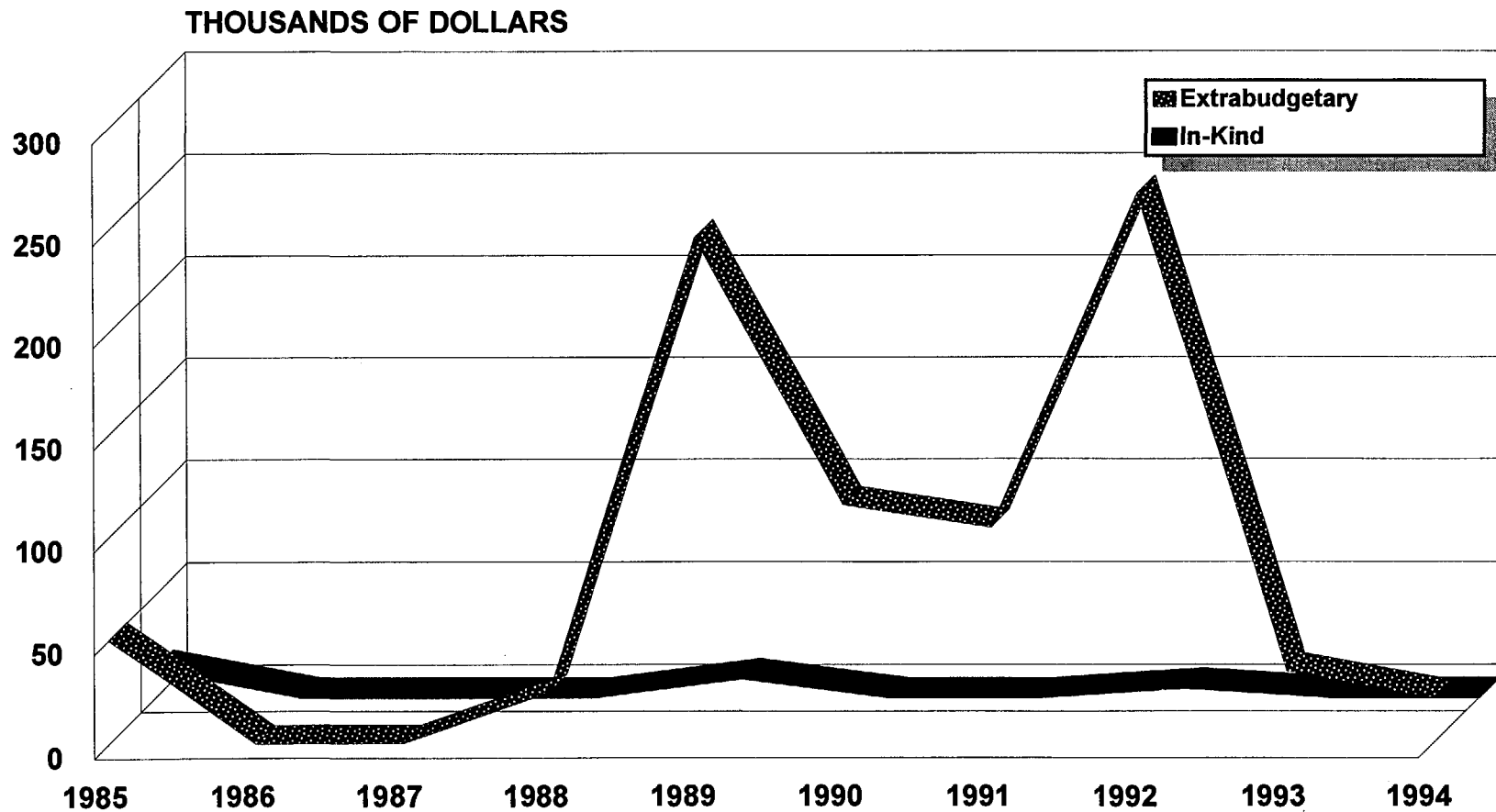
ASSISTANCE PROVIDED BY THE AGENCY TO GUATEMALA BY SOURCE (1985 - 1994)



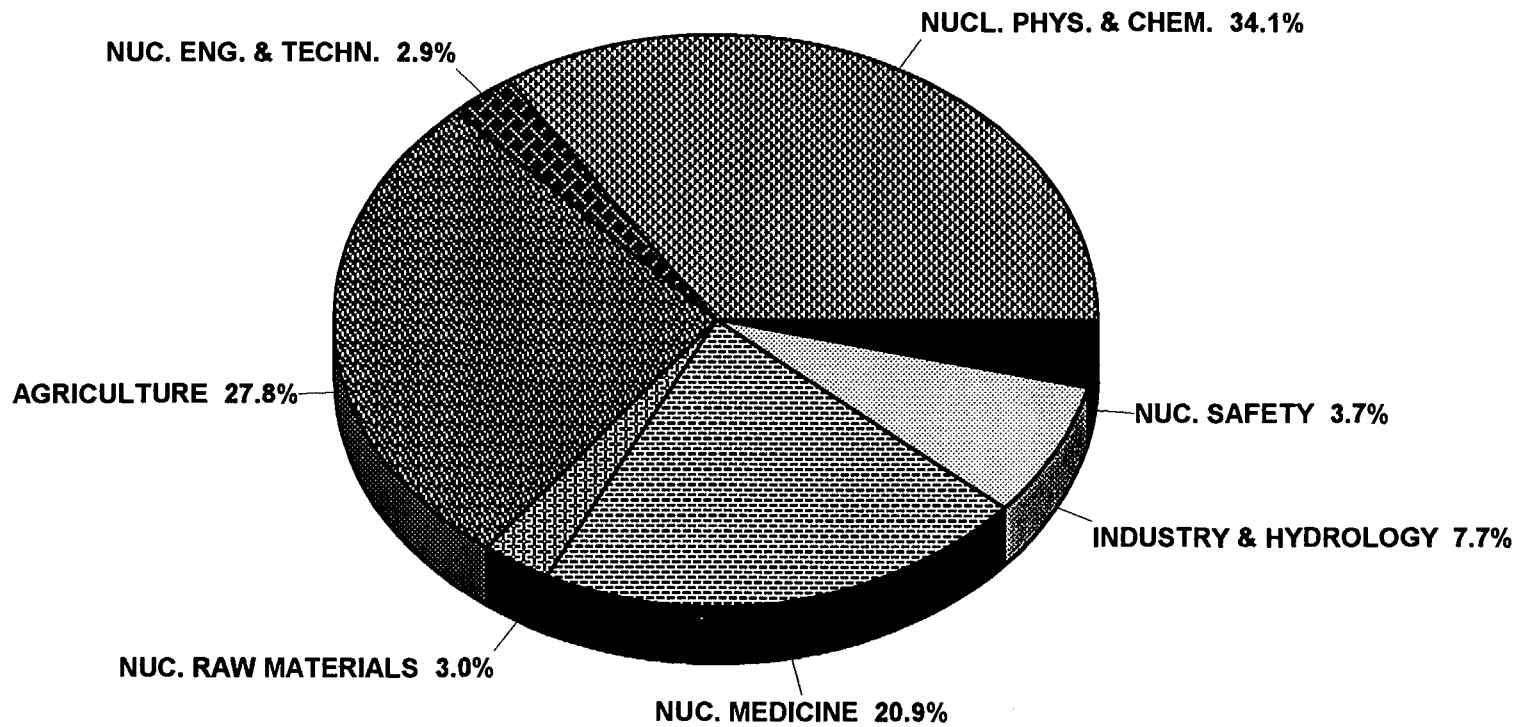
TACF ASSISTANCE PROVIDED TO GUATEMALA (1985 - 1994)



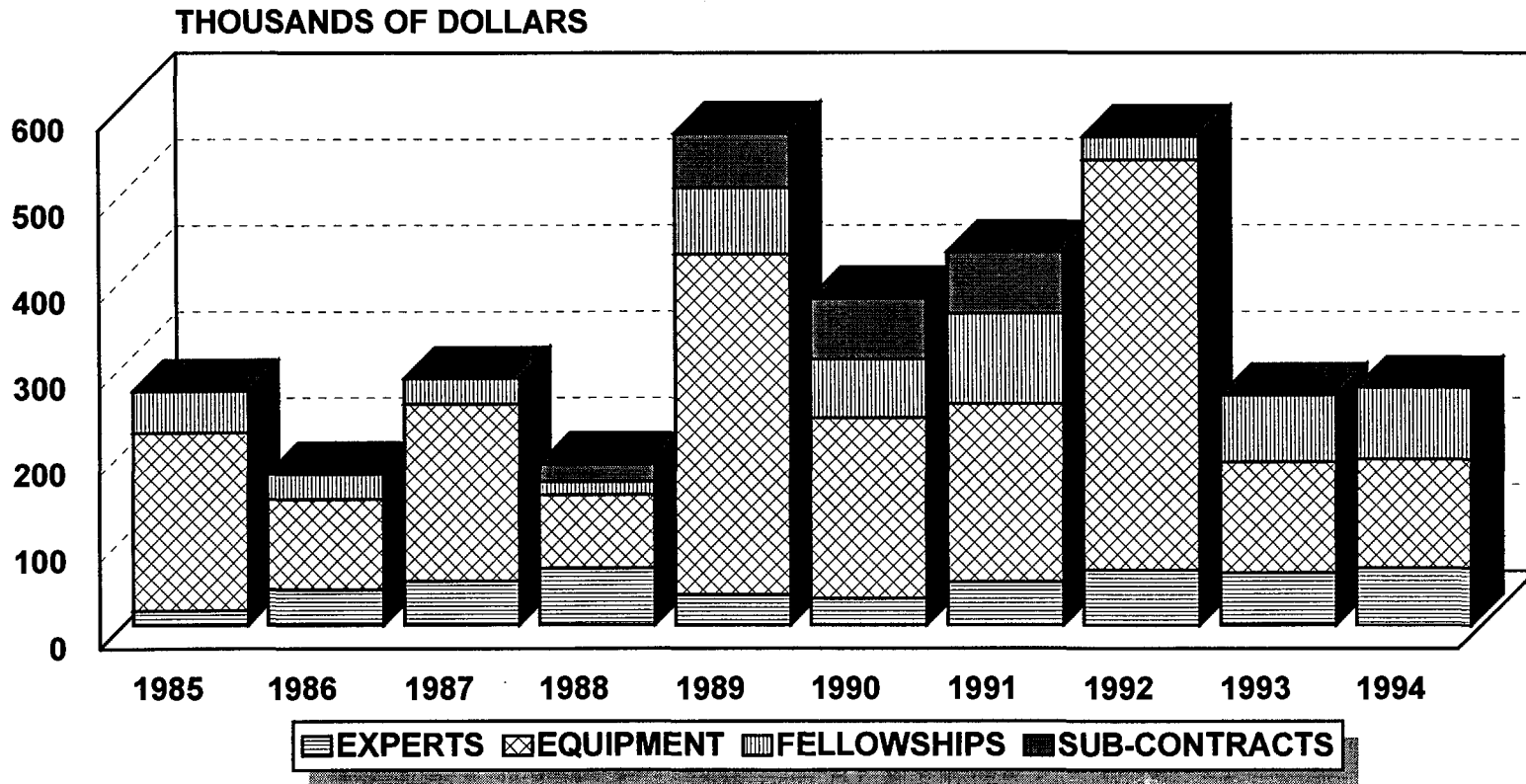
EXTRABUDGETARY AND IN-KIND ASSISTANCE PROVIDED TO GUATEMALA (1985 - 1994)



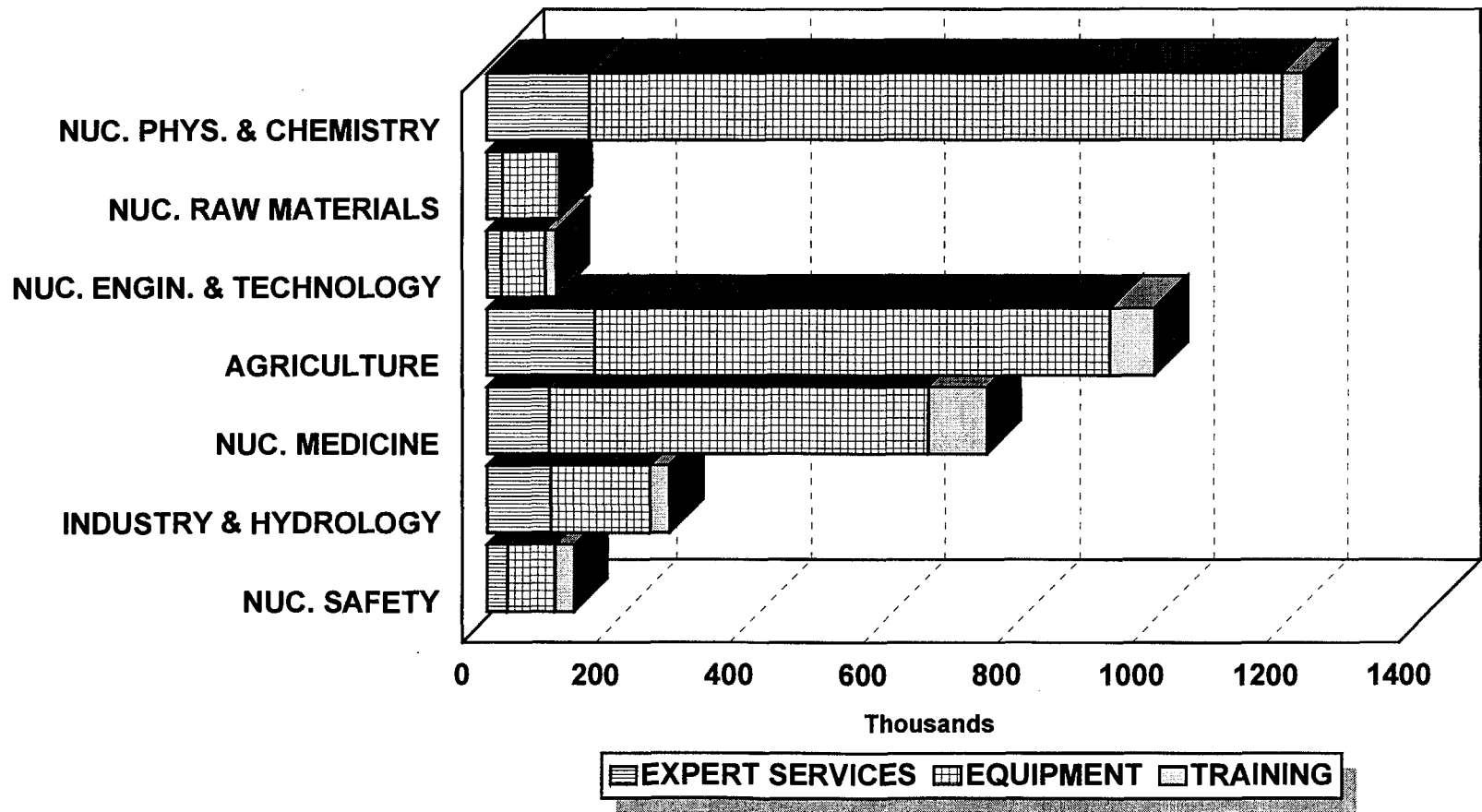
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THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH GUATEMALA

ALL SOURCES

GUATEMALA'S RANKING AS A TC RECIPIENT
1958 - 1994
(in \$1000)

YEAR	RANKING	AMOUNT
1958-84	59 th	737.4
1985	29 th	270.8
1986	47 th	174.8
1987	42 nd	284.9
1988	45 th	185.6
1989	22 nd	569.8
1990	35 th	378.2
1991	33 rd	431.3
1992	26 th	565.6
1993	45 th	265.7
1994	47 th	274.2
1958-94	45 th	4138.3

"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1994 (in \$1000)

ALL SOURCES

Year	I	II	III	IV	V	GUATEMALA
1958-84	EGY 10650.4	BRA 9513.7	PER 7574.2	IND 7412.8	PHI 6679.0	59 th - 737.4
1985	EGY 2494.8	PER 1120.7	THA 1117.4	BGD 1068.2	PHI 963.7	29 th - 270.8
1986	EGY 2317.0	BRA 1452.9	THA 1169.4	POL 1050.3	BGD 896.4	47 th - 174.8
1987	HUN 3452.6	EGY 1775.4	THA 1742.4	INS 1312.5	YUG 1223.2	42 nd - 284.9
1988	EGY 1486.9	BUL 1361.6	CPR 1278.5	THA 1158.7	BRA 1096.7	45 th - 185.6
1989	CPR 1542.3	EGY 1505.1	THA 1205.3	BRA 1096.5	INS 999.1	22 nd - 569.8
1990	POL 2308.1	CPR 2005.0	VIE 1589.2	INS 1412.6	BRA 1229.1	35 th - 378.2
1991	INS 1305.2	CPR 975.0	EGY 959.8	BRA 951.2	BUL 934.7	33 rd - 431.3
1992	EGY 1586.3	INS 1342.1	CPR 1328.8	MEX 1127.8	POL 1036.4	26 th - 565.6
1993	INS 1285.9	CPR 1091.7	PAK 1012.2	EGY 905.3	IRA 810.1	45 th - 265.7
1994	URT 2153.3	IRA 1438.5	CPR 1336.1	ARG 1225.8	GHA 1166.9	47 th - 274.2
1958-94	EGY 25492.2	BRA 19165.8	THA 16827.6	INS 16088.4	PER 14350.7	45 th - 4138.3

**"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1994 (in \$1000)**

TECHNICAL ASSISTANCE AND CO-OPERATION FUND

Year	I	II	III	IV	V	GUATEMALA
1958-84	EGY 4652.4	HUN 3458.4	PAK 3272.4	THA 2825.4	CUB 2761.7	62 nd - 528.9
1985	BGD 991.8	VIE 745.0	THA 708.7	BRA 571.8	POR 538.7	30 th - 206.6
1986	BRA 1381.8	THA 871.9	POL 833.5	BGD 823.9	SYR 751.8	43 rd - 174.8
1987	HUN 3305.2	DRK 986.8	BUL 888.5	INS 885.8	EGY 878.9	34 th - 284.6
1988	BUL 1195.6	PER 856.5	EGY 768.6	INS 751.7	MAL 656.0	44 th - 160.7
1989	EGY 990.9	CPR 868.2	POR 769.6	CHI 756.9	MAL 619.4	27 th - 314.0
1990	POL 1562.3	VIE 1518.8	DRK 1156.2	IRA 958.0	YUG 933.4	38 th - 262.3
1991	BUL 893.1	PAK 868.8	INS 855.1	VIE 817.6	CPR 814.5	37 th - 326.5
1992	EGY 1255.7	CPR 1009.0	VIE 872.8	INS 826.6	IRA 795.5	37 th - 292.8
1993	INS 1040.5	CPR 896.5	PAK 847.6	IRA 807.4	THA 721.5	46 th - 230.8
1994	URT 1392.9	IRA 1260.8	ARG 1206.5	CPR 1022.8	PAK 933.0	47 th - 252.1
1958-94	EGY 12209.1	PAK 9896.2	INS 9666.8	POL 9602.4	VIE 9566.6	47 th - 3034.1

ASSISTANCE PROVIDED BY THE AGENCY TO GUATEMALA

Financial Summary 1985 - 1994
(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
1985	16.8	205.8	48.2	-	-	270.8	-	182.0	24.6	50.4	13.8	270.8
1986	41.1	104.3	29.4	-	-	174.8	-	174.8	-	-	-	174.8
1987	50.9	204.8	29.2	-	-	284.9	-	264.3	20.3	0.3	-	284.9
1988	65.5	84.8	15.3	-	20.0	185.6	-	148.8	11.9	24.9	-	185.6
1989	34.9	394.5	77.1	-	63.3	569.8	-	308.1	5.9	246.7	9.1	569.8
1990	31.1	208.4	67.9	-	70.8	378.2	-	259.3	3.0	115.9	-	378.2
1991	49.7	205.7	105.1	-	70.8	431.3	-	326.5	-	104.8	-	431.3
1992	63.8	474.8	27.0	-	-	565.6	-	292.8	-	268.3	4.5	565.6
1993	60.2	128.0	77.5	-	-	265.7	-	230.8	-	34.9	-	265.7
1994	65.9	125.2	83.1	-	-	274.2	-	252.1	-	22.1	-	274.2
1985-94	479.9	2 136.3	559.8	-	224.9	3 400.9	-	2 439.5	65.7	868.3	27.4	3 400.9

TECHNICAL CO-OPERATION PROJECTS IN GUATEMALA
BY SECTOR

PROJECTS COMPLETED AND OPERATIONAL 1985 - 1995

TOTAL PROJECT ALLOTMENTS AND DISBURSEMENTS
(As of 1 November 1995)

SECTOR	NO. OF PROJECTS	ALLOTMENTS \$	% OF TOTAL	DISBURSEMENTS \$	% OF TOTAL
General atomic energy development	-	-	-	-	-
Nuclear physics and chemistry	7	1 330 715	31.7	1 220 923	34.1
Nuclear raw materials	1	112 325	2.7	107 970	3.0
Nuclear engineering and technology	2	117 132	2.8	103 795	2.9
Nuclear techniques in agriculture	9	1 235 671	29.5	997 942	27.8
Nuclear medicine	7	909 624	21.7	747 896	20.9
Nuclear techniques in biology	-	-	-	-	-
Nuclear techniques in industry and hydrology	2	259 356	6.2	275 241	7.7
Nuclear safety	2	228 637	5.4	130 993	3.6
TOTAL	30	4 193 460	100.0	3 584 760	100.0

TECHNICAL CO-OPERATION PROJECTS IN GUATEMALA
 COMPLETED AND OPERATIONAL, BY SECTOR, 1985 - 1995
 (As of 1 November 1995)

Sector	No. of projects	Total project allotments \$	Total project disbursements \$
<u>Completed projects</u>			
General atomic energy development	-	-	-
Nuclear physics and chemistry	4	1 042 115	1 032 542
Nuclear raw materials	1	112 325	107 970
Nuclear engineering and technology	1	70 087	67 443
Nuclear techniques in agriculture	5	819 281	828 575
Nuclear medicine	4	299 080	297 465
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	1	137 750	142 734
Nuclear safety	-	-	-
TOTAL	16	2 480 638	2 476 729
<u>Operational projects</u>			
General atomic energy development	-	-	-
Nuclear physics and chemistry	3	288 600	188 381
Nuclear raw materials	-	-	-
Nuclear engineering and technology	1	47 045	36 352
Nuclear techniques in agriculture	4	416 390	169 367
Nuclear medicine	3	610 544	450 431
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	1	121 606	132 507
Nuclear safety	2	228 637	130 993
TOTAL	14	1 712 822	1 108 031

**EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO GUATEMALA, BY SECTOR
PROJECTS COMPLETED AND OPERATIONAL 1985 - 1995
(As of 1 November 1995)**

FIELD	TOTAL PROJECT ALLOTMENTS				TOTAL PROJECT DISBURSEMENTS			
	EXPERT SERVICES		EQUIPMENT	TRAINING	EXPERT SERVICES		EQUIPMENT	TRAINING
	M/M	\$	\$	\$	M/M	\$	\$	\$
General atomic energy development	-	-	-	-	-	-	-	-
Nuclear physics and chemistry	23/13	181 913	1 086 665	62 137	21/20	154 030	1 033 125	33 768
Nuclear raw materials	4/02	27 435	84 890	-	3/02	23 386	84 584	-
Nuclear engineering and technology	3/10	30 465	68 567	18 100	3/13	21 473	65 917	16 405
Nuclear techniques in agriculture	24/18	228 287	871 613	135 771	18/21	161 942	768 282	67 718
Nuclear medicine	14/05	100 990	688 107	120 527	13/27	93 291	568 110	86 495
Nuclear techniques in biology	-	-	-	-	-	-	-	-
Nuclear techniques in industry & hydrology	8/27	76 765	149 900	32 691	8/08	95 792	150 386	29 063
Nuclear safety	4/26	50 500	121 360	56 777	3/10	31 100	70 988	28 905
TOTAL	83/11	696 355	3 071 102	426 003	72/11	581 014	2 741 392	262 354

AGENCY FELLOWS FROM GUATEMALA

1985 - 1995 ^{1/}
(As of 1 November 1995)

Sector	No. of fellowships	No. of months/days	Host countries
General atomic energy development	3	3/15	CHI, URU, IAEA
Nuclear physics	3	12/18	FRA, SIN, VEN
Nuclear chemistry	7	23/26	ARG, AUS, BRA, CUB, GRE, SPA, IAEA
Nuclear raw materials	1	6/04	COS
Nuclear engineering and technology	8	18/06	ARG, BRA, CHI, MEX
Nuclear techniques in agriculture	18	108/02	ARG, BRA, MEX, URU, USA, UK, IAEA
Nuclear medicine	15	73/23	BOL, BRA, CHI, HUN, MEX, SPA, THA, URU, UK, IAEA
Nuclear techniques in biology	3	4/00	AUS, BRA, CHI
Nuclear techniques in industry and hydrology	12	29/20	ARG, BRA, COL, GER, ITA, IAEA
Nuclear safety	13	46/12	ARG, BRA, CHI, COL, ECU, MEX, SPA, VEN
TOTAL	83	326/06	

^{1/} Awarded since 1985, but only includes fellows who have completed or at least started training.

**GUATEMALA
LONG-TERM FELLOWSHIPS
1985 - 1995
(As of 1 November 1995)**

Name	Field of study		Host country	Date	Duration	Project
RENDON ARANA	Entomology, insect genetics	5D	UK	Sep.89 - Sep.90	12/00	RLA/0/011
RENDON ARANA	Entomology, insect genetics	5D	UK	Jan.91 - Jan.92	12/00	RLA/0/014
ROMERO ORELLANA	Entomology	5D	IAEA	Jan.91 - Feb.92	13/24	RLA/0/011
RUEDA CALVET	Soil/plant/water relationships	5B	BRA	Feb.84 - Mar.86	25/13	GUA/5/005
TZI TZIBOY	Soil science	5B	BRA	Feb.90 - Feb.91	12/00	GUA/5/009
PADILLA MORALES	Nuclear medicine	6B	URU	Mar.88 - Mar.89	12/00	GUA/6/007
ROSALES RUEDA	Nuclear medicine	6B	MEX	Mar.85 - Mar.87	24/00	GUA/6/004

GUATEMALAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1985 - 1995
(As of 1 November 1995)

Name	Field of study	Host country	Date	Duration	Project	
ALVAREZ VARGAS	1. Radiation protection	9C	BRA	Mar.89 - Jun.89	3/00	RLA/0/011
	2. Radiation protection	9C	SPA	Jan.92 - Mar.92	2/00	GUA/9/003
CHACON ARREGA	1. Nuclear instrumentation	4G	ARG	Sep.90 - Dec.90	3/00	GUA/4/003
	2. Nuclear instrumentation, electronics and reactor control	4G	CHI	Jun.93 - Aug.93	2/00	RLA/0/015
	3. Nuclear instrumentation, electronics and reactor control	4G	MEX	May 95 - Jul.95	2/00	RLA/0/016
FREIRE MARTINEZ DE NAVE	1. Radiopharmaceutical production	6G	BRA	Nov.86 - Aug.87	9/00	GUA/6/006
	2. Production and control of radiopharmaceuticals	2G	SPA	Jun.94 - Jul.94	1/00	GUA/6/011
LOPEZ ARGUETA	1. Mutation breeding	5C	MEX	Sep.90 - Nov.90	2/00	GUA/5/008
	2. Soil science	5B	URU	Jul.92 - Aug.92	1/00	GUA/5/009
	3. Plant breeding and genetics	5C	BRA	Jul.94 - Sep.94	2/00	RLA/5/015
MOLINA MEJIA	1. Analytical chemistry	2C	CUB	Nov.89 - Dec.89	1/01	RLA/0/011
	2. Analytical chemistry	2C	ARG/PAR	Aug.94 - Nov.94	3/20	RLA/0/015
MONTEPEQUE ROLDAN	1. Plant breeding	5C	BRA	Nov.85 - Dec.85	0/26	RLA/0/006
	2. Plant breeding	5C	ARG	Jun.86 - Feb.87	8/00	RLA/0/006
	3. Mutation breeding of rice	5C	USA	Jul.91 - Jan.92	6/00	GUA/5/008

GUATEMALAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1985 - 1995
(As of 1 November 1995)

Name	Field of study		Host country	Date	Duration	Project
MORALES SANCHEZ	1. Analytical nuclear physics 2. INIS	1L 0F	FRA IAEA	Apr.85 - Oct.85 Oct.89	5/17 0/19	GUA/1/003 RLA/0/011
PADILLA MORALES	1. Nuclear medicine 2. Nuclear medicine	6B 6B	URU IAEA	Mar.88 - Mar.89 Oct.91	12/00 0/02	GUA/6/007 GUA/6/008
QUINTERO JORDAN	1. Production and control of radiopharmaceuticals 2. Radiopharmacy	2G 6G	GRE HUN	Oct.93 - Dec.93 May.95 - Jul.95	2/00 2/00	RLA/0/015 RLA/0/016
RENDON ARANA	1. Entomology, insect genetics 2. Entomology, insect genetics 3. Entomology	5D 5D 5D	UK UK IAEA	Sep.89 - Sep.90 Jan.91 - Jan.92 Sep.93 - Nov.93	12/00 12/00 3/00	RLA/0/011 RLA/0/014 RLA/0/015
SANCHEZ ROSAL	1. Nuclear medicine 2. Nuclear medicine	6B 6B	UK BOL	May 91 - Nov.91 May 94 - Jul.94	6/00 2/00	GUA/6/008 GUA/6/011
TOVAR RODAS	1. Radiation protection 2. Radiometry and dosimetry	9C 1K	CHI VEN	May 92 - Aug.92 Nov.94 - Dec.94	3/29 1/00	GUA/1/005 RLA/0/015

AGENCY TRAINING COURSES WITH GUATEMALAN PARTICIPATION

1985 - 1995
(As of 1 November 1995)

Field	Number of participants	Number of courses
General atomic energy development	9	7
Nuclear physics	2	2
Nuclear chemistry	16	16
Nuclear raw materials	-	-
Nuclear engineering and technology	21	21
Nuclear techniques in agriculture	29	26
Nuclear medicine	32	28
Nuclear techniques in biology	2	2
Nuclear techniques in industry & hydrology	72	71
Nuclear safety	47	40
TOTAL	230	213

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
AGUILAR RIVAS	RLA/8/005 (136)	RTC on ultrasonics in welded joints	1986	BRA
	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
	RLA/8/013 (109)	RWS on criteria for conception and management of test pieces for qualification and certification of NDT personnel	1991	CHI
AGUILAR SANDOVAL	INT/1/048 (001)	ITC on experimental nuclear spectroscopy	1992	USA
	RLA/2/003 (022)	RWS on certification of analytical laboratories	1995	CHI
	RLA/8/019 (001)	RTC on industrial applications of tracer techniques	1993	MEX
ALARCON CACEROS	RLA/8/005 (078)	RTC on ultrasonics (level II)	1985	PER
	RLA/8/006 (011)	RTC on computer-aided non-destructive testing	1986	MEX
	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 non-destructive testing	1989	NET
	RLA/8/013 (010)	International workshop on project achievements	1989	GER
	RLA/8/013 (011)	Regional seminar on NDT advanced techniques	1989	GER
	RLA/8/013 (012)	Regional seminar on NDT advanced techniques	1989	ITA
	RLA/8/013 (035)	RTC on NDT in quality assurance	1989	BRA
	RLA/8/013 (072)	RWS on underwater inspection	1990	BRA
	RLA/8/017 (016)	RWS on NDT for industrial quality	1992	CHI
	ALVAREZ VARGAS	RLA/8/013 (058)	RWS on radiation protection for radiographers	1990
RLA/9/009 (008)		RTC on quality control of diagnostic X-ray equipment	1988	BRA
RLA/9/009 (011)		RTC on dosimetric assessment of internal contamination	1988	BRA
RLA/9/009 (041)		RTC on clinical and radiation protection dosimetry	1989	BRA
RLA/9/009 (045)		RTC on radiation protection in radiodiagnosis	1990	ECU
RLA/9/011 (003)		RWS on co-ord. research work on disposal of medical & industrial radiation sources	1991	COL
RLA/9/011 (005)		Regional symposium on radiation protection and nuclear safety	1991	ARG
RLA/9/011 (011)		Regional informative seminar on application of new ICRP recommendations	1993	ECU
RLA/9/011 (014)		Regional meeting on co-ordinated studies on regulatory criteria	1993	MEX
RLA/9/014 (001)		RTC on radiation protection in medical practices	1994	BRA
RLA/9/016 (006)		RWS on implementation of the ICRP-60 and NBS recommendations	1995	PER

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
ARIZANDIETA ALTAN	RLA/5/028 (004)	Sub-regional TC for Central America on immunoanalysis, computer use and data analysis in diagnostic of animal diseases NTC on epidemiology and data analysis in ELISA for the diagnosis of animal diseases (ARCAL III)	1993	COS
	RLA/5/028 (008)		1994	ELS
ASTURIAS VELEZ	INT/9/116 (001)	ITC on radiation protection and nuclear safety RTC on clinical dosimetry and radiological protection RTC on management of spent radiation sources	1991	ARG
	RLA/9/011 (010)		1993	MEX
	RLA/9/013 (001)		1992	BRA
AVILA RAMIREZ	RLA/8/016 (001)	RTC on safe operation of radiation facilities - regulatory responsibilities Sub-regional workshop on the safe transport of radioactive material	1992	ECU
	RLA/9/017 (005)		1995	PAN
AYALA JIMENEZ	RLA/2/003 (004)	First RWS on nuclear analytical techniques Second RWS on nuclear analytical techniques RWS on nuclear analytical techniques and quality assurance Second RWS on quality assurance in analysis of environmental samples RTC on high-resolution radiation detectors RTC on industrial sterilization of health-care products: Regulatory aspects and control	1989	COL
	RLA/2/003 (007)		1990	ARG
	RLA/2/003 (010)		1990	ARG
	RLA/2/003 (023)		1995	URU
	RLA/4/006 (013)		1988	ARG
	RLA/8/016 (002)		1993	BRA
BALDIZON MARROQUIN	RLA/8/014 (006)	Second regional technical co-ordination meeting on the study of resources and contamination of underground water Third regional technical co-ordination meeting on the study of resources and contamination of underground water RTC on the use of tracers to study contaminant dispersion in surface waters	1991	CUB
	RLA/8/014 (007)		1993	VEN
	RLA/8/015 (001)		1991	ARG
CHACON ARREGA	RLA/4/006 (016)	RTC on maintenance of radiation protection equipment RWS on calibration and electronic evaluation of X-ray equipment used in medical diagnosis	1989	COL
	RLA/4/011 (003)		1995	PER

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
CHAVEZ BIETTI	INT/9/082 (001)	ITC on radiological protection and nuclear safety	1987	ARG
	RLA/9/009 (010)	RWS on radiation protection	1988	COL
	RLA/9/009 (012)	Regional seminar on quality control in radiotherapy	1988	PER
	RLA/9/009 (042)	Fifth RWS on radiation protection	1989	BRA
CORONADO MANSILLA	INT/6/036 (001)	ITC on nuclear medicine	1988	USSR
	RLA/6/022 (001)	RTC on paediatric nuclear medicine	1994	CHI
DIEGUEZ DAVILA	INT/9/141 (001)	Interregional post-graduate educational course on radiation protection	1994	USA
	RLA/9/017 (006)	Regional congress on radiological and nuclear safety for Central America and the Caribbean region	1995	PER
ESCOBAR LEIVA	RLA/4/006 (012)	RWS on development of appropriate software for small computers	1988	PAR
	RLA/4/008 (004)	RTC on repair of multichannel analysers	1991	BRA
	RLA/4/008 (007)	RWS on nuclear instruments in industry and their electronics	1992	CHI
	RLA/4/008 (013)	Final regional meeting of project co-ordinators (ARCAL II)	1994	CUB
	RLA/4/008 (016)	NTC on maintenance of nuclear detectors (ARCAL II)	1994	MEX
	RLA/6/020 (003)	RWS on maintenance and quality control of gamma camera - computer systems	1995	COL
FLORES VELIZ	RLA/8/005 (223)	Regional informative course on eddy current testing in boiler-tube inspection	1988	CHI
	RLA/8/006 (017)	Regional co-ordinators' meeting at the 13th World Conference on NDT	1992	BRA
	RLA/8/013 (005)	Regional informative course on NDT in composite materials	1988	PER
	RLA/8/013 (023)	RTC on eddy currents in ferromagnetic materials	1989	CHI
	RLA/8/013 (056)	RWS on quality assessment	1990	BRA
	RLA/8/013 (061)	RTC on inspection of LPG cylinders	1990	PER
	RLA/8/013 (111)	RWS on inspection of LPG cylinders	1991	DOM
	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
	RLA/8/017 (034)	RWS on quality improvement in metal-mechanical industry by eddy current	1992	CHI
RLA/8/017 (077)	National co-ordinators' meeting of the regional project RLA/8/017	1993	DOM	

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
FRANCO	INT/5/108 (001)	ITC on the induction and use of mutations in plant breeding RWS on improvement of rice and other cereals through mutation breeding	1987	AUS/CZE COL
	RLA/5/021 (002)		1988	
FREIRE MARTINEZ DE NAVE	RLA/2/007 (001)	Advanced RWS on the synthesis of modern radiopharmaceuticals RWS on production and labelling of radiopharmaceuticals for palliative therapy of metastatic bone pain (ARCAL XV) RTC on preparation and control of radiopharmaceuticals	1992	ARG CHI
	RLA/2/007 (006)		1994	
	RLA/6/014 (001)		1989	CHI
GOMEZ ORDONEZ	INT/9/139 (001)	ITC on safety assessment methodologies for near-surface radioactive waste Second regional congress on radiation protection and nuclear safety Regional congress on radiological and nuclear safety for Central America and the Caribbean region RTC on management of low-level radioactive waste	1994	USA MEX
	RLA/9/011 (012)		1993	
	RLA/9/017 (006)		1995	PER
	RLA/9/020 (001)		1994	ARG
GOMEZ Y GOMEZ	INT/9/116 (001)	ITC on radiation protection and nuclear safety RTC on establishment of a programme on occupational monitoring RTC on safety and regulation of radiation sources RWS on thermoluminescence dosimetry (ARCAL XVII) RTC on waste management: An integrated systems approach	1991	ARG BRA
	RLA/9/011 (006)		1992	
	RLA/9/015 (001)		1993	MEX
	RLA/9/016 (003)		1994	URU
	RLA/9/023 (001)		1995	SPA
GONZALEZ JUAREZ	INT/4/085 (001)	ITC on advanced nuclear electronics ITC on advanced interfacing in nuclear experiments RWS on repair of nuclear instrument module (NIM) RTC on advanced aspects of nuclear spectroscopy	1986	JAM DOM
	INT/4/096 (001)		1988	
	RLA/4/006 (007)		1987	URU
	RLA/4/006 (017)		1989	PAR
GRUENER ANTILLON	RLA/9/009 (002)	RWS on calibration procedures in dosimetry RWS on radiation protection	1986	ECU PER
	RLA/9/009 (005)		1987	

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
GUILLEN MORENO	INT/9/134 (001)	ITC on management of occupational exposure to ionizing radiation	1993	USA
	RLA/9/009 (045)	RTC on radiation protection in radiodiagnosis	1990	ECU
	RLA/9/011 (004)	RTC on thermoluminescence applied to dosimetry	1991	ECU
	RLA/9/011 (009)	RWS on co-ordinated studies in intercomparison of low-energy personnel dosimetry	1992	BRA
	RLA/9/016 (003)	RWS on thermoluminescence dosimetry (ARCAL XVII)	1994	URU
	RLA/9/016 (005)	Third regional congress on radiological and nuclear safety	1995	PER
GUTIERREZ ALVAREZ, G.	INT/9/103 (001)	ITC on safety and regulation of radiation sources	1990	USA
	RLA/6/006 (002)	RWS on nuclear cardiology	1992	SPA
	RLA/6/018 (001)	RTC on interventional methods in nuclear medicine	1993	COL
	RLA/6/019 (001)	RTC on medical scintigraphy	1993	CUB
JUAREZ CALDERON	RLA/7/006 (001)	RTC on sampling, sample preparation and data evaluation for multi-element and radionuclide analysis by nuclear and instrumental methods	1995	CHI
	RLA/8/016 (020)	RTC on radiation sterilization: Process validity and compatibility of materials	1995	ARG
MAZARIEGOS LOPEZ	RLA/6/016 (010)	RTC on the optimization of reagent production techniques and the organization of regional reagent distribution schemes	1993	MEX
	RLA/6/016 (012)	NTC on radioisotopes and radionuclides methodology	1993	MEX
	RLA/6/028 (001)	RWS on methodological aspects of HBV diagnosis by RIA and the organization of screening programmes	1995	MEX
MOLINA MONTERROSO	INT/5/125 (001)	ITC on induction and use of mutations in plant breeding	1992	AUS
	RLA/5/021 (007)	Advanced RTC on the use of personal computers for field data analysis	1991	URU
MONTEPEQUE ROLDAN	RLA/5/021 (001)	RTC on the use of mutation techniques in connection with cereals in in-vitro cultures	1987	PER
	RLA/5/021 (002)	RWS on improvement of rice and other cereals through mutation breeding	1988	COL
	RLA/5/021 (005)	Second RWS on improvement of rice and other cereals in Latin America through mutation breeding	1990	BRA

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
NORIEGA MOTA	RLA/4/006 (002)	RWS on design, mounting and maintenance of modular nuclear instrumentation	1986	COL
	RLA/4/006 (011)	RTC for technicians on maintenance and electromechanical problems of nuclear and related instruments in medicine	1988	COS
OLIVA HERNANDEZ DE SANDOVAL	RLA/2/003 (014)	RTC on application of flow injection analysis in studies of environmental and geological samples	1992	BRA
	RLA/2/003 (017)	RWS on determination of toxic elements at trace level in water and sediments using atomic absorption	1993	BRA
	RLA/2/003 (019)	RWS on quality assurance in analysis of environmental samples	1995	VEN
	RLA/9/011 (007)	RTC on measurement of environmental samples	1992	ARG
PADILLA MORALES	INT/6/040 (001)	ITC on nuclear medicine	1991	GER
	RLA/6/006 (001)	RWS on SPECT quality control	1992	SPA
	RLA/6/015 (001)	RTC on medical scintigraphy	1990	CUB
	RLA/6/018 (001)	RTC on interventional methods in nuclear medicine	1993	COL
PEREZ SABINO	INT/5/134 (001)	ITC on radiotracer and conventional techniques for studies of pesticides in food and the environment	1994	AUS
	RLA/2/003 (013)	RWS on collection strategies and preparation of samples in environmental problems	1992	CHI
	RLA/4/008 (014)	NTC on optimization and characterization of nuclear analytical equipment (ARCAL II)	1994	MEX
	RLA/7/005 (001)	RTC on strategies and methodologies for applied marine radioactivity studies	1992	MEX
PORTILLO DE PALMA	RLA/2/007 (003)	RTC on labelling and quality control of biomolecules	1993	CHI
	RLA/6/017 (001)	RTC on advances in hospital radiopharmacy	1992	SPA
RAMIREZ MORALES	INT/4/108 (001)	ITC on interfacing in nuclear experiments	1991	MAG
	RLA/4/006 (021)	RWS on maintenance of gamma cameras	1990	COL
RANERO ROSALES	RLA/0/009 (008)	RTC for librarians and information specialists on management and promotion	1992	BRA
	RLA/8/013 (001)	Regional informative course on computers in NDT	1988	ARG

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
RICHTER ARIS DE PENADOS	RLA/6/011 (001)	Regional train-the-trainers course on radioisotope methodology with special emphasis on radioimmunoassay	1988	ARG
	RLA/6/012 (001)	RTC on promotion and use of bulk reagents for radioimmunoassay of thyroid related hormones	1988	CHI
RODAS	RLA/8/005 (079)	RTC on welding inspection	1985	URU
	RLA/8/005 (127)	RTC on radiography (level II)	1986	CHI
RODRIGUEZ JIMENEZ	RLA/0/012 (001)	RTC on design, management and evaluation techniques of IAEA TC projects	1990	MEX
	RLA/4/007 (002)	RWS on radioisotope production in reactors, including the technology of radionuclide generators	1986	ARG
	RLA/4/007 (006)	RTC on radioisotope production and processing	1989	MEX
SANABRIA DIAZ	INT/5/112 (001)	ITC on the induction and use of mutations in plant breeding	1988	AUS
	RLA/5/020 (002)	RTC on food irradiation technology	1987	ARG
SANCHEZ ARENALES	INT/1/037 (001)	ITC on advanced data processing and interpretation in X-ray fluorescence analysis	1985	YUG
	RLA/4/006 (009)	RWS on small computer software for projects in nuclear laboratories: "Development of integrated software"	1987	AUS
	RLA/8/006 (010)	RTC on acoustic emission and holography in NDT	1985	BRA
SANCHEZ ROSAL	RLA/6/011 (019)	RWS on external quality control	1989	PAR
	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
	RLA/6/016 (013)	RWS on neonatal hypothyroid screening (ARCAL VIII)	1994	ECU
SOLORZNO DE ZEPEDA	RLA/8/016 (003)	Regional seminar on environmental applications of radiation and isotopes	1993	CHI
	RLA/8/016 (015)	RTC on fundamental aspects of radiation chemistry and applications (ARCAL XVI)	1994	ECU

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY GUATEMALAN NATIONALS
1985 - 1995
(As of 1 November 1995)**

Name	Course No.	Course title	Year	Location
SORIA LEMUS	RLA/8/005 (088)	Regional study tour for RWG members	1985	CAN
	RLA/8/005 (115)	Regional working group meeting V	1985	MEX
	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 (012)	RTC on radiography (level III)	1986	COL
	RLA/8/013 (024)	RTC on real time radiography	1989	BRA
	RLA/8/013 (026)	Regional working group meeting	1989	COS
	RLA/8/013 (106)	RTC on preparation of test procedures	1991	GUY
TORRES GARCIA	RLA/8/005 (086)	Regional train-the-trainers course on magnetic particles	1985	CAN
	RLA/8/006 (008)	RTC on surface methods (level III)	1985	BRA
TOVAR RODAS	RLA/9/011 (002)	RTC on safe operation of industrial radiation facilities	1991	MEX
	RLA/9/017 (006)	Regional congress on radiological and nuclear safety for Central America and the Caribbean region	1995	PER
VILLAGRAN RIVERA	INT/5/103 (001)	ITC on the use of isotope and radiation techniques in studies on biological nitrogen fixation	1986	AUS
	RLA/5/020 (001)	RWS on food irradiation	1986	BRA
	RLA/5/020 (003)	RTC on general aspects of food irradiation	1988	CHI

PROJECTS COMPLETED IN GUATEMALA SINCE 1985
(As of 1 November 1995)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1983	GUA/1/003	X-ray fluorescence in mineral analysis	9/14	63 035	280 692	-	9/15	55 910	280 199	-	1989
1984	GUA/1/004	Dosimetry laboratory (SSDL)	1/00	6 600	298 487	15 125	1/04	9 128	298 311	14 488	1995
1989	GUA/1/005	Dosimetry laboratory (phase II)	4/08	33 258	261 831	10 312	4/10	28 573	262 304	10 312	1995
1988	GUA/2/002	Nuclear analytical laboratory	3/12	24 480	48 295	-	3/18	24 990	48 327	-	1990
1983	GUA/3/003	Uranium prospection	4/02	27 435	84 890	-	3/02	23 386	84 584	-	1988
1989	GUA/4/003	Nuclear instrumentation laboratory	1/28	15 660	49 327	5 100	1/28	13 386	49 169	4 888	1993
1983	GUA/5/005	Radioisotopes in agriculture	4/05	27 415	202 451	2 471	4/05	26 742	202 512	2 820	1990
1984	GUA/5/006	Medfly eradication programme	1/15	10 350	69 885	-	1/16	8 495	71 678	-	1988
1988	GUA/5/007	Control of the mediterranean fruit fly ^{1/}	0/22	2 442	224 999	-	0/14	2 442	224 999	-	1991

^{1/} Equipment under sub-contract.

PROJECTS COMPLETED IN GUATEMALA SINCE 1985
(As of 1 November 1995)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1989	GUA/5/008	Mutation breeding	2/14	21 640	94 191	28 589	2/14	25 059	94 191	28 589	1994
1989	GUA/5/009	Nuclear techniques in soil sciences	4/13	38 160	71 007	25 681	4/22	46 656	67 620	26 772	1994
1976	GUA/6/004	Radioimmunoassay ^{2/}	3/00	9 000	39 000	-	3/03	15 947	29 147	-	1986
1983	GUA/6/006	Preparation and control of radio-pharmaceuticals	3/00	20 400	115 241	-	3/07	20 694	116 335	-	1990
1986	GUA/6/007	Nuclear medicine laboratory	3/00	20 850	38 500	-	3/02	17 946	40 848	-	1990
1989	GUA/6/008	Nuclear medicine laboratory (in vitro)	-	-	21 899	34 190	-	-	22 358	34 190	1992
1984	GUA/8/007	Isotopes in hydrology	4/00	29 250	92 700	15 800	3/28	33 067	93 392	16 275	1991
	TOTAL	16 Projects	50/13	349 975	1 993 395	137 268	50/08	352 421	1 985 974	138 334	

^{2/} Totals for equipment include gifts in kind by the USA: \$30 000 under allotments and \$21 732 under disbursements.

OPERATIONAL PROJECTS IN GUATEMALA
(As of 1 November 1995)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1989	GUA/2/003	Nuclear analytical laboratory	2/00	17 235	68 960	-	1/29	19 657	68 327	-
1993	GUA/2/004	Environmental contamination laboratory	1/09	13 905	38 200	10 000	0/19	9 386	37 343	8 968
1995	GUA/2/005	Radioactivity and contamination of the marine environment	2/00	23 400	90 200	26 700	0/15	6 386	38 314	-
1993	GUA/4/004	Maintenance and repair of computing equipment	1/12	14 805	19 240	13 000	1/15	8 087	16 748	11 517
1991	GUA/5/010	Immunoassay techniques in diagnosis of animal disease	3/17	34 720	50 580	14 980	3/18	34 603	51 902	9 537
1995	GUA/5/011	Plant nutrient management in traditional crops	3/00	36 000	72 000	33 900	1/02	7 848	27 913	-
1995	GUA/5/012	Mutations and biotechnology for crop improvement	2/07	26 060	50 300	30 150	0/20	10 097	27 467	-
1995	GUA/5/013	Genetic sexing to control the medfly	2/15	31 500	36 200	-	-	-	-	-

OPERATIONAL PROJECTS IN GUATEMALA
(As of 1 November 1995)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1990	GUA/6/009	Upgrading of a radiotherapy department	1/04	9 580	271 576	67 000	1/04	6 410	190 204	45 152
1991	GUA/6/010	Nuclear medicine	2/07	21 120	108 000	-	2/13	20 477	101 656	-
1993	GUA/6/011	Nuclear medicine network	1/24	20 040	93 891	19 337	0/28	11 817	67 562	7 153
1991	GUA/8/009	Isotopic study of geothermal fields	4/27	47 515	57 200	16 891	4/10	62 725	56 994	12 788
1991	GUA/9/003	Radiological protection	2/26	27 400	61 360	29 777	2/26	26 100	61 342	28 017
1995	GUA/9/004	Radiation protection in waste handling and disposal	2/00	23 100	60 000	27 000	0/14	5 000	9 646	888
	TOTAL	14 Projects	32/28	346 380	1 077 707	288 735	22/03	228 593	755 418	124 020

COUNTERPART INSTITUTIONS IN GUATEMALA (I)

(By Project)

Project No. Institute Counterpart(s)

NUCLEAR PHYSICS AND CHEMISTRY

GUA/1/003	General Directorate of Nuclear Energy, Guatemala City	AYALA JIMENEZ
GUA/1/004	General Directorate of Nuclear Energy, Guatemala City	ASTURIAS VELEZ GOMEZ Y GOMEZ
GUA/1/005	General Directorate of Nuclear Energy, Guatemala City	TOVAR RODAS
GUA/2/002	General Directorate of Nuclear Energy, Guatemala City	AYALA JIMENEZ
GUA/2/003	General Directorate of Nuclear Energy, Guatemala City	AYALA JIMENEZ
GUA/2/004	General Directorate of Nuclear Energy, Guatemala City	AGUILAR SANDOVAL PEREZ SABINO
GUA/2/005	General Directorate of Nuclear Energy, Guatemala City	PEREZ SABINO OLIVA HERNANDEZ DE SANDOVAL

NUCLEAR RAW MATERIALS

GUA/3/003	1. Ministry of Energy and Mines, General Directorate of Mines, Guatemala City	PAIZ LUCERO
	2. General Directorate of Nuclear Energy, Guatemala City	PINEDA GONZALEZ

NUCLEAR ENGINEERING AND TECHNOLOGY

GUA/4/003	General Directorate of Nuclear Energy, Guatemala City	ESCOBAR LEIVA
GUA/4/004	General Directorate of Nuclear Energy, Guatemala City	ESCOBAR LEIVA RAMIREZ MORALES

COUNTERPART INSTITUTIONS IN GUATEMALA (I)

(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>AGRICULTURE</u>		
GUA/5/005	1. General Directorate of Nuclear Energy, Guatemala City	RUEDA CALVET MONTEPEQUE ROLDAN
	2. University of San Carlos, Faculty of Agronomy, Guatemala City	SALAZAR
	3. Institute of Nutrition of Central America and Panama, Guatemala City	ARROJAVE
GUA/5/006	MOSCAMED Programme, Breeding and Sterilization Laboratory, Guatemala City	MATA PEREIRA HENTZE PENADOS
GUA/5/007	MOSCAMED Programme, Breeding and Sterilization Laboratory, Guatemala City	HENTZE PENADOS
GUA/5/008	1. General Directorate of Nuclear Energy, Guatemala City	MONTEPEQUE ROLDAN
	2. Institute of Agricultural Science and Technology, Guatemala City	PAZOS
GUA/5/009	1. General Directorate of Nuclear Energy, Guatemala City	ALFARO VILLATORO
	2. Institute of Agricultural Science and Technology, Guatemala City	PEREZ
GUA/5/010	1. Ministry for Agriculture, Livestock and Food, General Directorate for Livestock Services, Guatemala City	JIMENEZ
	2. University of San Carlos, Faculty of Veterinary Medicine and Animal Science, Guatemala City	MIRANDA HAMMER
GUA/5/011	1. General Directorate of Nuclear Energy, Guatemala City	GARCIA CHACLAN
	2. Institute of Agricultural Science and Technology, Guatemala City	COLLADO DE COLOCHO

COUNTERPART INSTITUTIONS IN GUATEMALA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>AGRICULTURE (cont'd)</u>		
GUA/5/012	1. General Directorate of Nuclear Energy, Guatemala City	MOLINA MONTERROSO
	2. Institute of Agricultural Science and Technology, Guatemala City	RAMIREZ GARCIA PAZOS
	3. Sugar Cane Research Centre, Guatemala City	GUEVARA CENGICA
GUA/5/013	MOSCAMED Programme, Guatemala City	NATARENO ANDRADE
<u>NUCLEAR MEDICINE</u>		
GUA/6/004	General Directorate of Mining and Hydrocarbons, Guatemala City	GONZALEZ
GUA/6/006	General Directorate of Nuclear Energy, Guatemala City	GUTIERREZ ALVAREZ
GUA/6/007	1. "San Juan de Dios" General Hospital, Guatemala City	GUTIERREZ ALVAREZ RODRIGUEZ JIMENEZ
	2. General Directorate of Nuclear Energy, Guatemala City	PINEDA GONZALEZ
GUA/6/008	1. "San Juan de Dios" General Hospital, Guatemala City	GUTIERREZ ALVAREZ
	2. General Directorate of Nuclear Energy, Guatemala City	RICHTER ARIS DE PENADOS
GUA/6/009	1. Cancer Research Centre, Guatemala City	ESCOBAR AGUIRRE
	2. General Directorate of Nuclear Energy, Guatemala City	ALVAREZ VARGAS
GUA/6/010	General Directorate of Nuclear Energy, Guatemala City	GUTIERREZ ALVAREZ
GUA/6/011	"San Juan de Dios" General Hospital, Guatemala City	GUTIERREZ ALVAREZ PADILLA MORALES

COUNTERPART INSTITUTIONS IN GUATEMALA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR TECHNIQUES IN INDUSTRY AND HYDROLOGY</u>		
GUA/8/007	1. General Directorate of Nuclear Energy, Guatemala City	ARAGON CASTILLO
	2. National Institute of Seismology, Volcanology, Meteorology and Hydrology, Department of Underground Waters, Guatemala City	ARAGON CASTILLO ALVAREZ E.
GUA/8/009	National Institute for Electrification, Geothermal Development Unit, Guatemala City	CAICEDO ROLDAN MANZO
<u>NUCLEAR SAFETY</u>		
GUA/9/003	General Directorate of Nuclear Energy, Guatemala City	ALVAREZ VARGAS
GUA/9/004	General Directorate of Nuclear Energy, Guatemala City	GOMEZ Y GOMEZ GOMEZ ORDONEZ

COUNTERPART INSTITUTIONS IN GUATEMALA (II)
(By Institute)

GUATEMALA CITY

General Directorate of Nuclear Energy
Guatemala City

GUA/1/003	X-Ray Fluorescence in Mineral Analysis
GUA/1/004	Dosimetry Laboratory (SSDL)
GUA/1/005	Dosimetry Laboratory (Phase II)
GUA/2/002	Nuclear Analytical Laboratory
GUA/2/003	Nuclear Analytical Laboratory
GUA/2/004	Environmental Contamination Laboratory
GUA/2/005	Radioactivity and Contamination of the Marine Environment
GUA/3/003	Uranium Prospection
GUA/4/003	Nuclear Instrumentation Laboratory
GUA/4/004	Maintenance and Repair of Computing Equipment
GUA/5/005	Radioisotopes in Agriculture
GUA/5/008	Mutation Breeding
GUA/5/009	Nuclear Techniques in Soil Sciences
GUA/5/011	Plant Nutrient Management in Traditional Crops
GUA/5/012	Mutations and Biotechnology for Crop Improvement
GUA/6/006	Preparation and Control of Radiopharmaceuticals
GUA/6/007	Nuclear Medicine Laboratory
GUA/6/008	Nuclear Medicine Laboratory (in vitro)
GUA/6/009	Upgrading of a Radiotherapy Department
GUA/6/010	Nuclear Medicine
GUA/8/007	Isotopes in Hydrology
GUA/9/003	Radiological Protection
GUA/9/004	Radiation Protection in Waste Handling and Disposal

Ministry of Energy and Mines
General Directorate of Mines
Guatemala City

GUA/3/003	Uranium Prospection
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Ministry for Agriculture, Livestock and Food
General Directorate for Livestock Services
Guatemala City

GUA/5/010	Immunoassay Techniques in Diagnosis of Animal Disease
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COUNTERPART INSTITUTIONS IN GUATEMALA (II)
(By Institute)

GUATEMALA CITY

MOSCAMED Programme
Guatemala City

GUA/5/006 Medfly Eradication Programme
GUA/5/007 Control of the Mediterranean Fruit Fly
GUA/5/013 Genetic Sexing to Control the Medfly

Institute of Agricultural Science and Technology
Guatemala City

GUA/5/008 Mutation Breeding
GUA/5/009 Nuclear Techniques in Soil Sciences
GUA/5/011 Plant Nutrient Management in Traditional Crops
GUA/5/012 Mutations and Biotechnology for Crop Improvement

Institute of Nutrition of Central America and Panama
Guatemala City

GUA/5/005 Radioisotopes in Agriculture

Sugar Cane Research Centre
Guatemala City

GUA/5/012 Mutations and Biotechnology for Crop Improvement

General Directorate of Mining and Hydrocarbons
Guatemala City

GUA/6/004 Radioimmunoassay

**National Institute of Seismology, Volcanology,
Meteorology and Hydrology**
Department of Underground Waters
Guatemala City

GUA/8/007 Isotopes in Hydrology

COUNTERPART INSTITUTIONS IN GUATEMALA (II)
(By Institute)

GUATEMALA CITY

**National Institute for Electrification
Geothermal Development Unit
Guatemala City**

GUA/8/009 Isotopic Study of Geothermal Fields

**University of San Carlos
Faculty of Agronomy
Guatemala City**

GUA/5/005 Radioisotopes in Agriculture

**University of San Carlos
Faculty of Veterinary Medicine and Animal Science
Guatemala City**

GUA/5/010 Immunoassay Techniques in Diagnosis of Animal Disease

**Cancer Research Centre
Guatemala City**

GUA/6/009 Upgrading of a Radiotherapy Department

**"San Juan de Dios" General Hospital
Guatemala City**

GUA/6/007 Nuclear Medicine Laboratory
GUA/6/008 Nuclear Medicine Laboratory (in vitro)
GUA/6/011 Nuclear Medicine Network

**THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH
GUATEMALA
(1985 - 1995)**

LONG-TERM EXPERT ASSIGNMENTS

NONE

RESEARCH CONTRACTS/AGREEMENTS IN GUATEMALA SINCE 1985 ^{1/}
(As of 1 November 1995)

Field of activity	No. of contracts/ agreements	Amount allocated \$
Nuclear chemistry	3	22 000
Nuclear engineering and technology	2	19 000
Nuclear techniques in agriculture	17	151 100
Nuclear medicine	5	38 500
Nuclear techniques in biology	3	38 600
Nuclear techniques in industry & hydrology	3	58 997
TOTAL	33	328 197

^{1/} New awards since 1985.

**SCIENTISTS FROM GUATEMALA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS AND
TRAINING COURSE LECTURERS
OR
PARTICIPATING IN CO-ORDINATION MEETINGS
1985 - 1995
(As of 1 November 1995)**

Name	No. of assignments	Project(s)
AGUILAR SANDOVAL	1	RLA/2/003
ALARCON CACEROS	4	RLA/8/005, RLA/8/006, RLA/8/013
ALVAREZ VARGAS	5	GUA/9/003, RLA/9/009, RLA/9/011, RLA/9/016
AYALA JIMENEZ	10	COL/2/009, COS/2/002, DOM/8/004, PAN/2/004, RLA/2/003, RLA/8/016
BALDIZON MARROQUIN	2	RLA/8/014
CASTANEDA	3	ARG/5/005, CHI/5/015
DEL VALLE	1	ARG/5/005
ESCOBAR LEIVA	1	RLA/4/008
FLORES VELIZ	1	RLA/8/013
FREIRE MARINEZ	2	RLA/2/007
GONZALEZ JUAREZ	3	INT/4/054, RLA/4/006
GUILLEN MORENO	1	RLA/9/011
GUTIERREZ ALVAREZ	1	RLA/6/027
HARNANDEZ VELASQUEZ	1	RLA/4/008
LINARES	1	INT/0/048
MONTEPEQUE ROLDAN	1	RLA/5/021
MORALES SANCHEZ	4	DOM/1/004, RLA/0/009, RLA/2/003
PINEDA GONZALEZ	6	RLA/0/006, RLA/8/020
RENDON ARANA	3	INT/0/048, INT/5/131, POR/5/005
RICHTER ARIS DE PENADOS	4	RLA/6/011, RLA/6/016

**SCIENTISTS FROM GUATEMALA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS AND
TRAINING COURSE LECTURERS
OR
PARTICIPATING IN CO-ORDINATION MEETINGS
1985 - 1995
(As of 1 November 1995)**

Name	No. of assignments	Project(s)
RODRIGUEZ JIMENEZ	3	GUA/2/002, INT/0/048, RLA/8/017
ROMERO ORELLANA	2	ARG/5/005, CHI/5/015
ROSALES TORRES	1	RLA/8/006
SANCHEZ ARENALES	4	COS/1/005, INT/0/040, RLA/4/006
SORIA LEMUS	5	RLA/8/005, RLA/8/006, RLA/8/013
TELLO	1	RLA/6/029
VELASQUEZ VASQUEZ	1	RLA/0/006
VILLATORO	1	POR/5/005
TOTAL	73	

**AGENCY FELLOWSHIPS AND SCIENTIFIC VISITS
HOSTED BY GUATEMALA
1985 - 1995
(As of 1 November 1995)**

Recipient country	No. of fellowships	No. of scientific visits	TOTAL ¹
ARGENTINA	4	16	20
BOLIVIA	-	1	1
CHILE	6	2	8
COLOMBIA	1	-	1
COSTA RICA	-	1	1
CUBA	-	1	1
ECUADOR	1	1	2
MAURITIUS	3	1	4
MOROCCO	-	3	3
PAKISTAN	-	1	1
PHILIPPINES	2	-	2
PORTUGAL	2	2	4
THAILAND	-	2	2
TUNISIA	-	1	1
URUGUAY	1	-	1
TOTAL	20	32	52

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

**REGIONAL AND INTERREGIONAL GROUP TRAINING EVENTS
HOSTED BY GUATEMALA
1985 - 1995
(As of 1 November 1995)**

Course No.	Course Title	Partici- pants	Year
RLA/0/009 (005)	RTC for Librarians and Information Specialists in Nuclear Science and Technology	9	1990
RLA/2/007 (004)	RTC on Hospital Radiopharmacy for Central American Countries	6	1993
RLA/4/006 (008)	Regional Seminar on Recent Advances in Nuclear Data Acquisition and Analysis Systems	15	1987
RLA/4/006 (022)	RTC on Maintenance of Power Supplies in Nuclear Instruments	10	1990
RLA/5/021 (006)	Advanced RTC on Doubled Haploid Techniques in Mutation Breeding	7	1990
RLA/5/026 (001)	RTC and Seminar on the Sterile Insect Technique for Fruit Fly Control or Eradication	12	1989
RLA/6/011 (044)	NTC on Radioisotope Methodology and Basic Radioimmunoassay	1	1990
RLA/8/005 (116)	Sixth Regional Working Group Meeting on Non-Destructive Testing in Latin America	14	1985

**REGIONAL AND INTERREGIONAL GROUP TRAINING EVENTS
HOSTED BY GUATEMALA
1985 - 1995
(As of 1 November 1995)**

Course No.	Course Title	Partici- pants	Year
RLA/8/005 (128)	RTC on Surface Methods (Level II)	11	1986
RLA/8/006 (015)	International Workshop on Implementation and Implications of ISO International Standard	6	1988
RLA/8/013 (110)	RWS on Non-Destructive Testing in Civil Works	15	1991
RLA/8/016 (022)	RTC on the Use of Nuclear Techniques in the Optimization of the Use of Water and in the Environmental Protection Industries	15	1995
RLA/9/017 (001)	Sub-Regional Workshop on Control of Radiation Safety	7	1993
	TOTAL	128	