THE AGENCY'S PROGRAMME FOR 1973 - 78 AND BUDGET FOR 1973

GC(XVI)/485

Printed by the
International Atomic Energy Agency
in Austria - August 1972

INTERNATIONAL ATOMIC ENERGY AGENCY

CONTENTS

ANNEXES

LIST OF ABBREVIATIONS

ACABQ	Advisory Committee on Administrative and Budgetary Questions of the General Assembly of the United Nations
ACC	Administrative Committee on Co-ordination (of the United Nations)
Agency	International Atomic Energy Agency
Board	Board of Governors (of the Agency)
CCAQ	Consultative Committee on Administrative Questions
CINDA	Computer Index of Neutron Data
CREST	Committee on Reactor Safety Technology (of OECD (NEA))
D	Director
DDG	Deputy Director General
DG	Director General
ECE	Economic Commission for Europe (of the United Nations)
ECOSOC	Economic and Social Council of the United Nations
ESNA	European Society for Nuclear Methods in Agriculture
EUCARPIA	European Association for Research on Plant Breeding
EURATOM	European Atomic Energy Community
EXFOR	Exchange Format for Neutron Data
FAO	Food and Agriculture Organization of the United Nations
Fourth Geneva Conference	Fourth International Conference on the Peaceful Uses of Atomic Energy
GS	General Service category (staff)
IAEA	International Atomic Energy Agency
IAMS	International Association of Microbiological Societies
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ICRP	International Commission on Radiological Protection

ICRU	International Commission on Radiation Units and Measurements
ICSH	International Committee for Standardization in Haematology
ICSU	International Council of Scientific Unions
IG	Inspector General
IHD	International Hydrological Decade
ILO	International Labour Organisation
IMCO	Inter-Governmental Maritime Consultative Organization
INIS	International Nuclear Information System
ISO	International Organization for Standardization
IUPAC	International Union of Pure and Applied Chemistry
IUPAP	International Union of Pure and Applied Physics
Joint FAO/IAEA Division	Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture
M&O	Maintenance and Operatives Service (staff)
Monaco Laboratory	International Laboratory of Marine Radioactivity at Monaco
NORAD	Norwegian Agency for International Development
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
OECD	Organisation for Economic Co-operation and Development
OECD (NEA)	OECD-Nuclear Energy Agency
OILB	International Organization for Biological Control of Noxious Animals and Plants
P	Professional category (staff)
PNE	Peaceful nuclear explosions
RENDA	Request-list for Neutron Data Measurements (OECD)
SABRAO	Society for the Advancement of Breeding Research in Asia and Oceania
SIDA	Swedish International Development Authority
Trieste Centre	International Centre for Theoretical Physics at Trieste
UNDP	United Nations Development Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPU	Universal Postal Union
USAEC	United States Atomic Energy Commission
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WMO	World Meteorological Organization

NOTES

1. All sums of money are expressed in United States dollars.

2. Round brackets are used in financial tables to indicate decreases, and in other tables to indicate the change in the situation from 1972, as shown in the budget for that year (GC(XV)/460).

I. INTRODUCTION

General

I.1. In accordance with Article XIV.A of the Statute, the Board of Governors hereby submits to the General Conference the budget estimates for 1973, preliminary estimates for 1974, and the programme of work for the Agency for the six-year period 1973-78. The Board requests the General Conference to approve its budgetary and programme recommendations for 1973.

I.2. Estimates shown for the year 1974 are based upon presently known conditions and trends and are presented as preliminary estimates only. Budget estimates for 1974 will be presented to the General Conference at its seventeenth regular session, with supporting programme explanations. It may be expected that adjustments to the preliminary figures may be necessary as a result of changes in programme emphasis or in factors outside the control of the Agency.

Change in format

I.3. The experience gained in the past by the Secretariat and the desire to take into account comments made by the representatives of Member States during the discussions on the Agency's programme and budget have led the Director General to introduce some changes in the presentation of the Agency's six-year programme. It is considered that this new format will facilitate the process of phasing out some elements of the programme and introducing new ones reflecting the changing pattern of nuclear science and techniques.

I.4. The basic idea underlying this new pattern of arrangement of the technical programmes is to put more emphasis on projects rather than general functions, and thus provide a clearer picture of the work undertaken by the Agency. The degree to which this objective has been achieved varies according to the different fields of the Agency's activities. In the programmes connected with the application of nuclear techniques in agriculture, medicine, food preservation and industry, the Agency is co-ordinating research on specific methods which may subsequently be utilized, for instance in the framework of the technical assistance programme, once their application has become routine. These activities can be more easily arranged as projects than those in the field of nuclear safety, for example, where the Agency's role is indirect and involves the working out of uniform guides, review studies and recommendations. In this type of work, some continuity, both from the point of view of selected long-term problems as well as methods applied, is necessary. Efforts have been made to describe what has been achieved in programmes, although it is recognized that in many cases it is quite difficult to identify and put to practical use valid indicators of achievements.

I.5. The splitting-up of the programme into clearly identifiable components has made the programme document more specific and makes it possible to include brief comments on the proposed date of completion or phasing out of projects. It is considered that this information will be particularly useful in judging the value of proposed programmes and in setting priorities. Compared to the former presentation, additional information is provided on related activities, such as the servicing of technical assistance requests, research contracts and agreements, and laboratory services. It is hoped that the information on links between the Agency's promotional activities and the technical assistance programme will prove to be an aid for the developing countries when drawing up requests for technical assistance. The scope and form of the Agency's co-operation with other organizations, as well as between various Agency organizational units is also indicated.

I.6. If the new format is found satisfactory by the Agency's policy-making organs, it is the Director General's intention to provide information on the cost estimates of individual programme components in future programme and budget presentations.

I.7. In order to facilitate study of the document and to show how the various programmes have been presented, the standardized form of presentation used is shown in Figure 1 below.

FIGURE 1 Standardized form of programme presentation

NUCLEAR POWER AND REACTORS

THE PROGRAMME

OBJECTIVE

RESULTS TO DATE

PLANS FOR 1973-78

RELATED ACTIVITIES

CO-OPERATION WITH OTHER ORGANIZATIONS

STRUCTURE

This programme consists of ... sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

URANIUM RESOURCES

OBJECTIVE

STRUCTURE

This sub-programme consists of ... components which are described in the following paragraphs.

Exploration of uranium reserves

Objective

Results to date

Plans for 1973-74

Related activities

Plans for 1975-78

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

COSTS

Trends in the overall programme

I.8. The period 1973-74, for which a detailed programme has been formulated, will be marked by some changes in the extent and character of the Agency's activities corresponding to developments in the field of nuclear energy.

I.9. In activities relating to nuclear reactors and fuel, more emphasis will be placed on the introduction of nuclear power in developing countries, as in this period a number of these countries will be planning, constructing or commissioning their first nuclear power stations. As many large, mainly light-water power reactors will be put into commerical operation, the analysis of their operating experience will be intensified in order to make it available to interested Member States.

I.10. Taking into account the increasing public concern about man's environment and the rapid growth of nuclear power generation throughout the world, the Agency will considerably extend its activities connected with the study of the behaviour, fate and consequences to the environment of releases of radionuclides resulting from all kinds of peaceful uses of nuclear energy. These studies will aim at the elaboration of recommended standards of safety concerning the dispersion into the environment of radioactive waste resulting from the peaceful use of nuclear energy. The Board recently considered this to be one of the Agency's most important and urgent tasks in which the Agency, in the light of its statutory responsibilities, should take the leading role in close collaboration with competent organs of the United Nations, the specialized agencies and other international organizations concerned.

I.11. In promoting activities connected with the application of nuclear methods and techniques in food and agriculture, life sciences, hydrology and industry, periodic reviews will be made of progress and prospects. This will facilitate both the process of setting priorities for those areas of research where results of economic interest for developing countries can be expected within the immediate or near future and of making available the results of completed projects. The transfer of those activities involving the use of nuclear methods which have become established or routine to other interested organizations in the United Nations family will also be actively pursued. The granting of research contracts to complement programmes will be increased. The practice of co-ordinating research activity by means of co-ordinated research programmes, which proved to be useful in the past, will be widened and, to the extent possible depending upon the subject matter, organized on a regional basis.

I.12. Although the technical assistance programme reflects entirely the wishes of individual Member States, it may be anticipated that in the next few years more Agency assistance will be concentrated on projects directly or indirectly involved in the introduction of nuclear power or installation of large radiation sources. Member States with a basically agricultural economy will continue to concentrate their atomic energy development within the framework of agricultural research centres with multidisciplinary programmes. These trends will also change the pattern of the needs for training facilities in the developing countries.

I.13. The Agency will prepare for a period of wide application of its safeguards system in connection with NPT. Procedures, techniques and instrumentation developed to achieve the safeguards objective under the optimum economic conditions for the Agency, the States and the facility operators, will be introduced into routine operations. The rapid increase of the number of samples of safeguarded nuclear materials to be analysed will be handled by a network of analytical laboratories in Member States, with which contractual arrangements will be made, and also by setting up in 1973-75 an Agency safeguards analytical laboratory to enable it to make periodical assessments of the limits of errors in the results of analyses of samples performed by national laboratories.

I.14. In the field of scientific and technical information, 1973 will be the first year throughout which INIS will operate with the full subject scope, and this will result in a substantial increase in the coverage of literature and enable the participating Member States to benefit more from the system.

1972 Revised Budget

I.15. Since the time that the Agency's budget for 1972 was approved, the on-going survey of the deployment and utilization of staff has resulted in a number of changes in the organizational structure of several Departments and in a number of internal transfers of posts to obtain the maximum benefit from available resources. In order to reflect these changes and other administrative adjustments made within the approved 1972 budget totals and to allow for meaningful comparisons with the 1973 estimates, a "1972 Revised Budget" has been drawn up.

I.16. The Research Contracts Section of the Department of Research and Isotopes has been transferred to the Division of Budget and Finance of the Department of Administration, where it has been renamed the Contracts Administration Section and given wider responsibilities, and conference services previously dealt with by both the Division of Scientific and Technical Information and the Division of General Services have been consolidated in the Division of External Relations. The public information services have also been transferred to the Division of External Relations. The Languages Division has been amalgamated with the Secretariat of the General Conference and the Board of Governors to form the Division of Languages and Policy-making Organs. Intensive use has been made of all available authorized posts by transfers of posts to programmes where requirements are most pressing. A number of such shifts have been made in order to permit the regrading of some posts, as recommended in the survey, and in a few cases no funds have been provided in the budget because the posts will not for the time being be filled (see Annex IV, Tables 1 and 2).

I.17. In line with the objective of showing all the costs involved in carrying out specific programmes, the funds to meet the costs of interpretation required for meetings have been applied on an estimated basis to the programmes responsible for the meeting. This has the effect of reducing the cost of Service and support activities and increasing the cost of programmes using interpretation services, except for Policy-making organs to which the cost of the latter services has been charged in the past. It is expected that the cost of other support activities, such as computer services, will be charged in future to programmes using support services.

I.18. Finally, it will be recalled that a special appropriation line, "adjustments to staff emoluments, including common staff costs", was included in the 1972 budget to be applied as required to the various programmes upon the approval of the Board. The funds authorized were accordingly distributed and are incorporated in the several figures under established posts and common staff costs in respect of each programme.

The Regular Budget for 1973

I.19. The appropriations proposed for the Regular Budget for 1973 total $18 127 000. After deducting $1 377 000 for expected income for the period the total amount to be assessed on Member States is $16 750 000, which represents an increase of $1 358 000 or 8.8% over the assessment in 1972.

I.20. Most of the increase is attributable to the continuing rises in prices and to the consequences of the revaluation of currencies. Only a very small increase in funds has been devoted to programme expansion in certain areas. It will be necessary to compensate for the higher costs of goods and services by slightly curtailing the activities in a number of programmes; the reductions in question are shown throughout under various items of expenditure. The greater emphasis on environmental problems will require additional funds to permit an extension of the work of the Division of Nuclear Safety and Environmental Protection.

I.21. In view of the importance placed on the fostering of scientific development work throughout the world, the funds for research and technical contracts in the scientific programmes have been increased to permit the extension of this work.

I.22. Although income from miscellaneous sources is not expected to increase at the same rate as in recent years, every effort has been made to increase the income from the provision of various services. It should be noted in particular that income from the sale of Agency publications will increase significantly due to higher sales. Because of the rising publication and distribution costs, a price increase in Agency publications is foreseen; this would lead to a further increase in income. It is also expected that the increasing demand for INIS publications will augment receipts considerably.

I.23. After taking into account the estimated income from all sources, the resulting assessment increase of 8.8% can be attributed to a 9.9% overall increase in prices, including approximately $700 000 or 4.5% due to the revaluation of currencies, less a 1.1% reduction in programme activities.

I.24. While it was assumed in the estimates for 1972 that a third class of post adjustment [I.1] for Vienna would become effective from October 1972, it in fact became effective on 1 January 1972. A fourth class of post adjustment became necessary in May 1972. The present estimates for 1973 provide for a fifth class of post adjustment in September 1973. It should be noted, however, that with rapidly increasing prices and continuing changes in the currency exchange rates, this post adjustment might be required even earlier.

I.25. The changes in the exchange rates between certain currencies, particularly the Austrian schilling and the dollar, late in 1971 and early in 1972 had the effect of increasing the dollar equivalent of GS and M&O salaries by more than 7%. These changes also resulted in increases in costs in respect of common services, supplies and equipment which are purchased locally, common staff costs related to GS and M&O salaries and, to a lesser degree, costs of scientific supplies and equipment, as well as costs of meetings held in locations where the local currency had been revalued.

I.26. The maximum use of available manning table posts has been made in order to allow the Agency's work to be performed without an increase in the number of authorized posts. It should be noted especially that because the implementation of safeguards agreements in connection with NPT has not proceeded at the rate anticipated, it will not be necessary to take on additional safeguards inspectors in the numbers expected and at the time first planned. It is now foreseen that 45 inspectors in the Division of Operations will be sufficient to carry out the Agency's commitments at the end of 1972. At the rate of growth now envisaged for 1973, 15 additional inspectors will be required and these should be recruited only in the month of October, bringing the total to 60 at the end of the year. Funds will therefore be provided for 45 inspectors for the whole year and for the additional 15 for the last three months only. The present estimates indicate the need for a further increase of 20 inspectors in mid-1974 bringing the total to 80.

I.27. Since staff costs absorb such a large proportion of the Agency's funds in the execution of programmes, every effort has been made to confine expansion to work in which it was considered essential. In addition, further efforts have been made in this direction by examining the possible benefits of having certain services performed by outside contractors. In this respect, the cleaning of the Agency's building at Traungasse in Vienna is being carried out by a contractor on a trial basis, and the cost benefits will be studied to ascertain whether this arrangement should be continued or not.

[I.1] A "class" of post adjustment means the fixed amount which is added to the net salary for each 5% rise in the cost of living above the base level.

Target for voluntary contributions to the General Fund

I.28. The target for 1972 for voluntary contributions to the General Fund was set at $3 million and the response of Member States in increasing their contributions towards meeting that target has been satisfactory. It is to be expected that contributions for that year will exceed 80% of the target. The Board considers that the target should be maintained at $3 million for 1973, and it is hoped that contributions will be further increased.

Working Capital Fund

I.29. The General Conference will be aware that the Board's proposals which led to a reduction in the level of the Working Capital Fund from $2 million to $1.7 million [I.2] in September 1971 were formulated as far back as the previous June. During the year that has since elapsed, however, the financial picture has changed considerably. The continuing fluctuations in currency rates of exchange as well as rising costs are contributing to the Agency's difficulties, but a factor of much greater importance is the increase in the total sum in respect of assessed contributions to Regular Budgets for 1971 and previous years which, according to present indications, either may or are likely to remain unpaid [I.3].

I.30. The Board would be failing in its duty if it neglected to invite the Conference's attention to a situation that has already become serious. In that context the Board has come to the conclusion that the level of the Working Capital Fund must be raised in order to ensure that the Agency will have adequate funds available in cash to meet its day-to-day requirements. The Board understands that a level of $2 million is likely to prove sufficient to meet such requirements if those Members which have in the past paid their assessed contributions late in the year in the future to pay them earlier. The Board has been informed that, this being the case, the Director General was communicating with the Members in question with a view to inducing them to advance the dates of payment of such contributions; it has, however, noted that it will be impossible to determine the precise level of the Fund that will be required until the responses to those communications are known. For the time being, therefore, it can do no more than recommend that for 1973 the level be set at $2 million, a figure which it requests the Conference to approve by adoption of draft resolution C in Annex V.

Report on the budget to the United Nations General Assembly

I.31. In accordance with Article XVI of the Agency's relationship agreement with the United Nations [I.4], the budget will be reviewed by ACABQ, which will report on the administrative aspects thereof to the Assembly.

[I.2] GC(XV)/457.
[I.3] For the situation at the end of 1971, see document GC(XVI)/484, Part IV, Schedule B.1.
[I.4] INFCIRC/11, part I.

II. THE CONSOLIDATED BUDGET

Table II. 1

Item	1971 Actual	1972 Revised	1973 Estimate
RECEIPTS			
Regular Budget			
Assessed contributions of Member States	12 201 519	15 392 000	16 750 000
Transfer of 1969 cash surplus for use in 1971	136 258	-	-
Miscellaneous income	1 023 279	1 169 000	1 377 000
General Fund			
Voluntary contributions	2 134 328	3 000 000	3 000 000
Special contributions	295 000	295 000	295 000
Miscellaneous income	67 010	80 000	80 000
Operating Fund I			
Direct contributions for Trieste Centre	332 237	260 000	271 000
Reimbursable laboratory services	61 200	-	-
Miscellaneous income	37 604	15 000	30 000
Drawings on unobligated balance	38 682	-	-
Savings on prior years' operations	12 883	-	-
Adjustment to Trieste income[a/]	(125 000)	-	-
Operating Fund II			
Government contributions in respect of experts' services	62 502	65 000	65 000
Miscellaneous income	13 513	-	-
Drawings on unobligated balance	278 092	-	-
	16 569 107[b/]	20 276 000	21 868 000
EXPENDITURES			
Regular Budget	14 010 024	16 561 000	18 127 000
Operating Fund I	715 606	570 000	596 000
Operating Fund II	2 492 445	3 145 000	3 145 000
	17 218 075[b/]	20 276 000	21 868 000

a/ See The Agency's Accounts for 1971 (GOV/1527, Part III, para. 26).

b/ The difference of $648 968 between expenditures and receipts represents the provisional cash deficit for 1971.

FIGURE 2
Total expenditures 1971, 1972 and 1973 by programme
Regular Budget, Operating Fund I, Operating Fund II

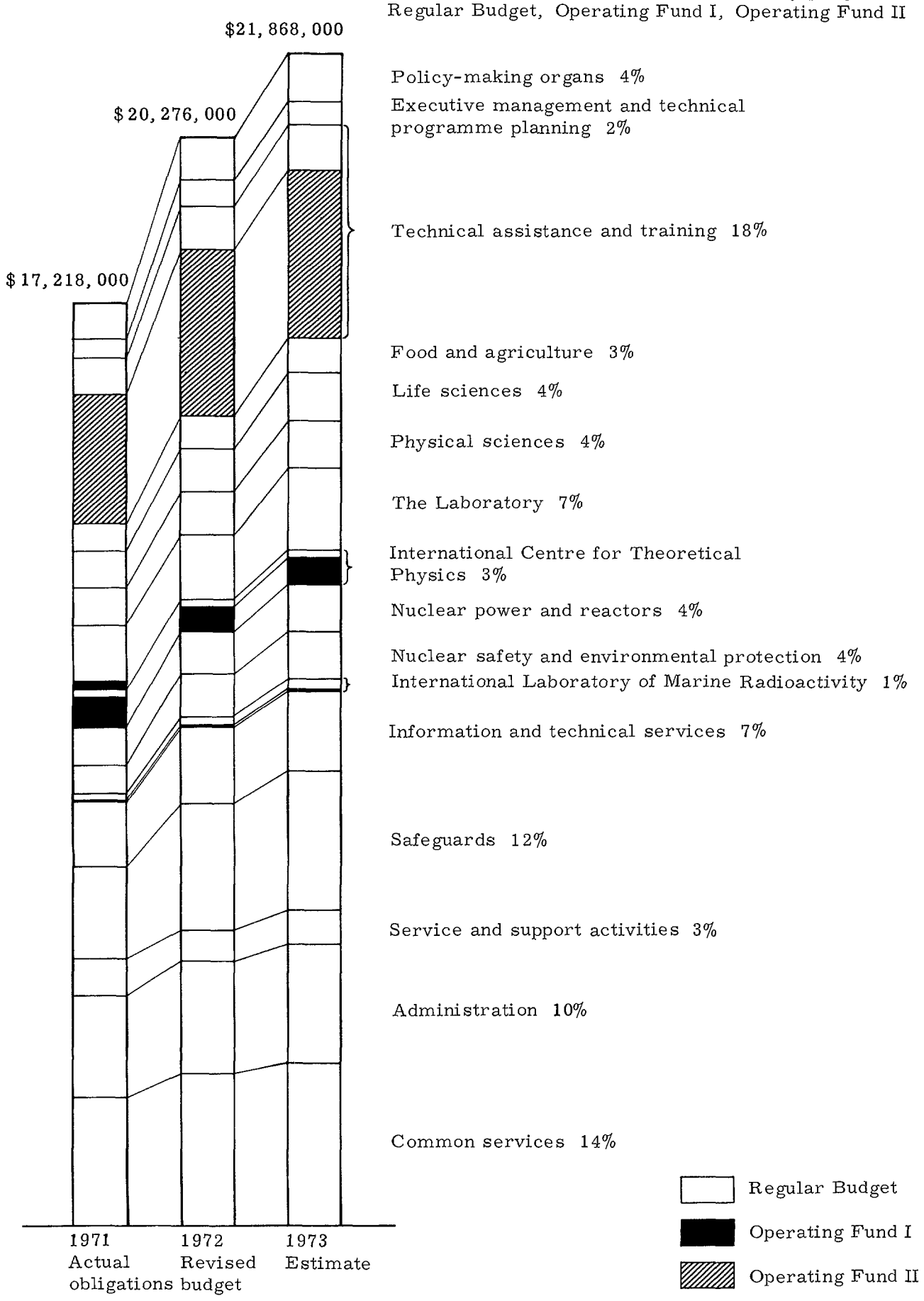
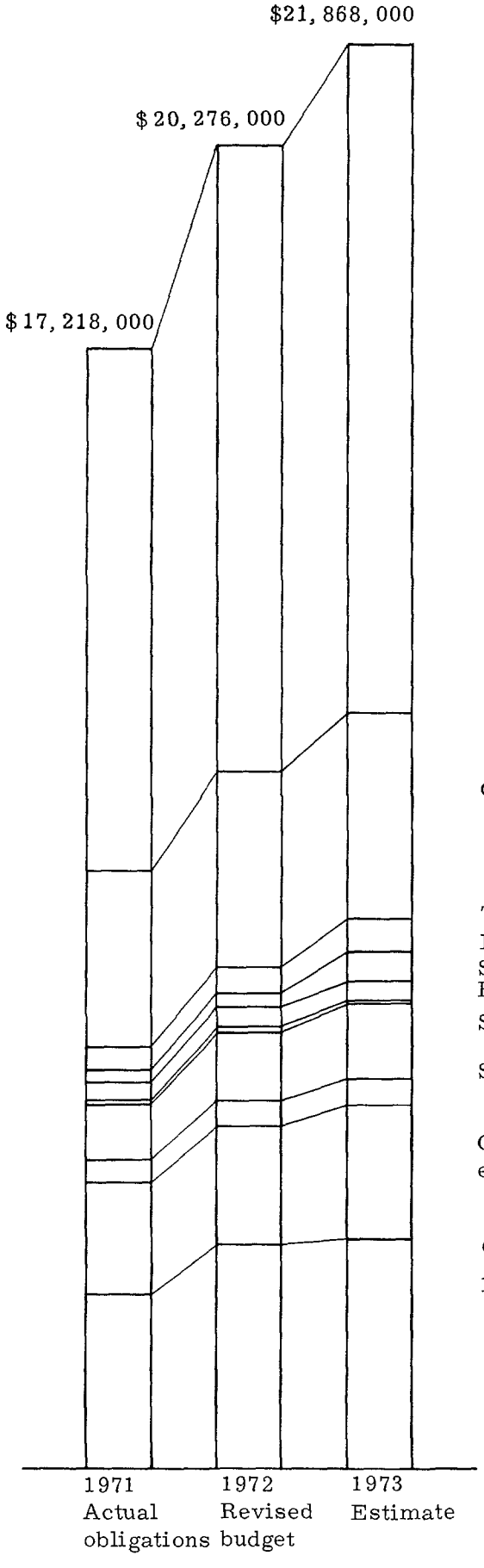


FIGURE 3
Total costs for 1971, 1972 and 1973 by item of expenditure



Salaries and wages 46.5%

Common staff costs 14.8%

Travel 2.2%
Panels and committees 2.1%
Seminars, symposia and conferences 1.4%
Representation and hospitality 0.2%
Scientific and technical contracts 5.4%

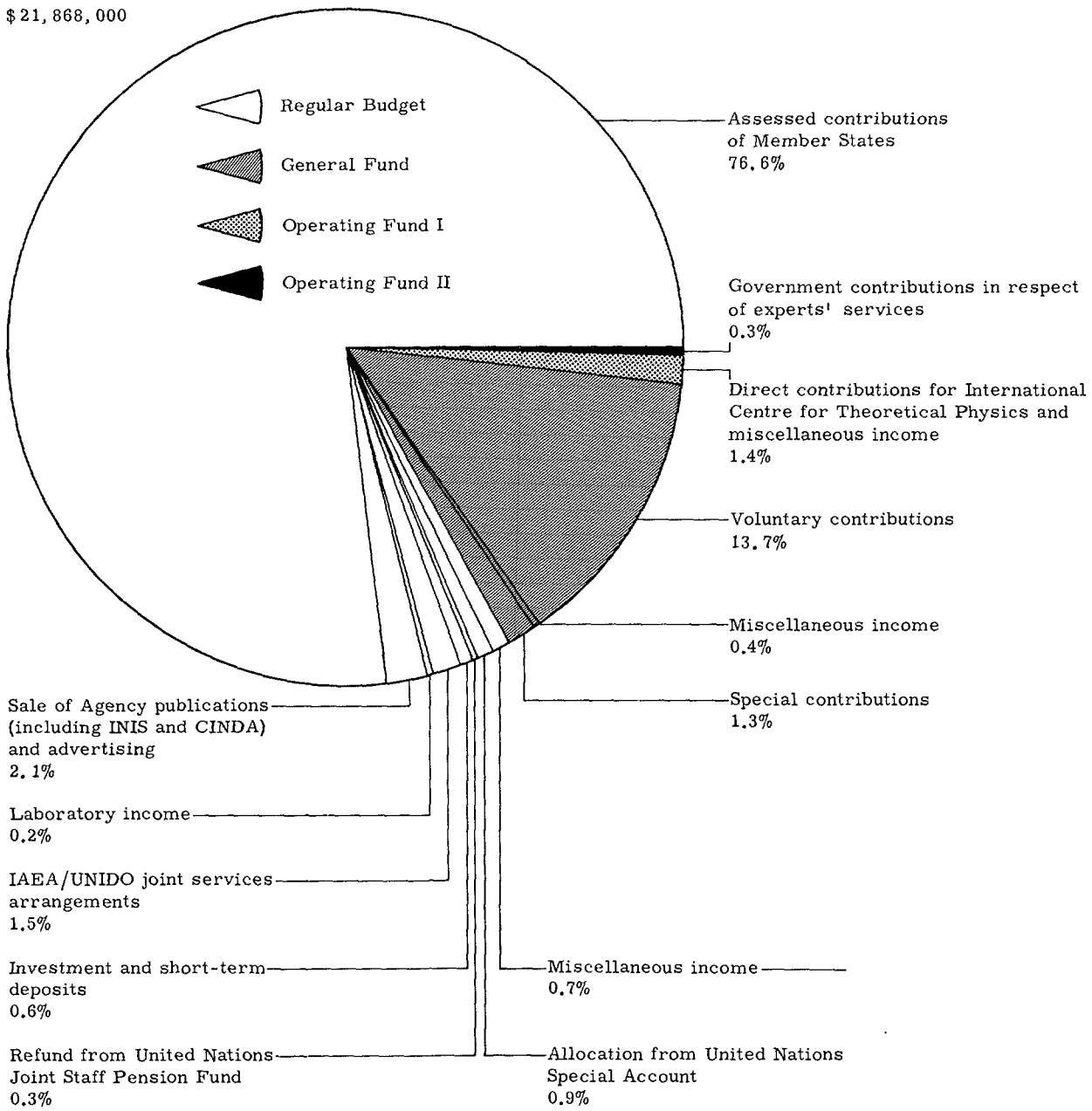
Scientific supplies and equipment 1.8%

Common services, supplies and equipment 9.5%

Other: 16.1%

Consists of:	
Operating Fund II	$ 3 145 000
Safeguards plutonium laboratory	120 000
Inter-agency activities	21 000
International Centre for Theoretical Physics	237 000
External audit	7 000
	$3 530 000

FIGURE 4
Total income for 1973 by source



III. THE REGULAR BUDGET

Summary of expenditures and income

Table III. 1

Item	1971 Actual	1972 Revised budget	Increase or (decrease) over 1972	1973 Estimate
Expenditures				
Policy-making organs	741 647	705 000	80 000	785 000
Executive management and technical programme planning	331 230	380 000	22 000	402 000
Technical assistance and training	640 131	724 000	51 000	775 000
Food and agriculture	565 745	621 000	82 000	703 000
Life sciences	622 670	730 000	66 000	796 000
Physical sciences	695 479	848 000	61 000	909 000
The Laboratory	1 018 252	1 305 000	163 000	1 468 000
Trieste Centre	155 000	150 000	5 000	155 000
Nuclear power and reactors	682 694	834 000	77 000	911 000
Nuclear safety and environmental protection	557 925	732 000	144 000	876 000
Monaco Laboratory	185 622	217 000	24 000	241 000
Information and technical services	1 183 497	1 492 000	100 000	1 592 000
Safeguards	1 636 423	2 456 000	142 000	2 598 000
Service and support activities	665 666	634 000	68 000	702 000
Administration	1 840 933	1 955 000	135 000	2 090 000
Common services	2 487 110	2 778 000	346 000	3 124 000
	14 010 024	16 561 000	1 566 000	18 127 000
Income				
Assessed contributions on Member States	12 201 519	15 392 000	1 358 000	16 750 000
Transfer of 1969 cash surplus for use in 1971	136 258	-	-	-
Sale of Agency publications	256 605	298 000	52 000	350 000
Sale of INIS publications including microfiches	25 684	40 000	35 000	75 000
Sale of INIS tapes purchased from computer programme funds	a/	5 000	1 000	6 000
Sale of CINDA publications	b/	10 000	-	10 000
Advertising	b/	10 000	-	10 000
Laboratory income	-	45 000	2 000	47 000
Sale of surplus property	c/	3 000	7 000	10 000
IAEA/UNIDO joint services arrangement	103 756	309 000	14 000	323 000
Amounts recoverable under safeguards agreements from non-member States	-	-	30 000	30 000
Investment and short-term deposits	195 100	130 000	-	130 000
Refund from United Nations Joint Staff Pension Fund	56 767	74 000	(6 000)	68 000
Allocation from the United Nations Special Account	181 510	175 000	20 000	195 000
Reimbursement under Food Irradiation Project	-	-	20 000	20 000
United Nations - Fourth Geneva Conference	105 750	-	-	-
Other	98 107	70 000	33 000	103 000
	13 361 056	16 561 000	1 566 000	18 127 000

a/ Included in INIS publications.

b/ Included in Agency publications.

c/ Included in "Other".

Summary of income, expenditures and allocations

Table IV.1

Item	General Fund			Operating Fund I			Operating Fund II		
	1971 Actual	1972 Budget	1973 Estimate	1971 Actual	1972 Budget	1973 Estimate	1971 Actual	1972 Budget	1973 Estimate
INCOME									
Voluntary contributions of Member States	2 134 328	3 000 000	3 000 000	-	-	-	-	-	-
Special contributions of Member States:									
Italian Government	250 000	250 000	250 000	-	-	-	-	-	-
Monaco Government	45 000	45 000	45 000	-	-	-	-	-	-
Direct contributions for special projects									
Ford Foundation	-	-	-	50 000	50 000	50 000	-	-	-
UNESCO· Regular contribution	-	-	-	150 000	150 000	155 000	-	-	-
UNDP projects	-	-	-	60 979	-	-	-	-	-
SIDA	-	-	-	51 226	60 000	66 000	-	-	-
Danish Atomic Energy Commission	-	-	-	10 000	-	-	-	-	-
Reimbursable laboratory services	-	-	-	61 200	-	-	-	-	-
Income from investment and short-term deposits	67 010	80 000	80 000	-	-	-	-	-	-
Government contributions in respect of experts' services	-	-	-	-	-	-	62 502	65 000	65 000
Miscellaneous income	-	-	-	47 636	15 000	30 000	13 513	-	-
Drawings on unobligated balance	-	-	-	38 682	-	-	278 092	-	-
Savings in prior years' operations	-	-	-	12 883	-	-	-	-	-
Adjustment to Trieste income[a/]	-	-	-	(125 000)	-	-	-	-	-
TOTAL	2 496 338	3 375 000	3 375 000	357 606	275 000	301 000	354 107	65 000	65 000
Transfers from General Fund to Operating Fund I:									
Laboratory	(63 000)	-	-	63 000	-	-	-	-	-
Trieste Centre	(250 000)	(250 000)	(250 000)	250 000	250 000	250 000	-	-	-
Monaco Laboratory	(45 000)	(45 000)	(45 000)	45 000	45 000	45 000	-	-	-
to Operating Fund II:	(2 138 338)	(3 080 000)	(3 080 000)	-	-	-	2 138 338	3 080 000	3 080 000
TOTAL	-	-	-	715 606	570 000	596 000	2 492 445	3 145 000	3 145 000
EXPENDITURES AND ALLOCATIONS									
Operating Fund I:									
Laboratory	-	-	-	152 307	-	-	-	-	-
Trieste Centre	-	-	-	516 107	525 000	551 000	-	-	-
Monaco Laboratory	-	-	-	47 192	45 000	45 000	-	-	-
Operating Fund II:									
Technical assistance: Experts and equipment	-	-	-	-	-	-	1 565 965	2 445 000	2 445 000
Fellowships and training	-	-	-	-	-	-	926 480	700 000	700 000
TOTAL	-	-	-	715 606	570 000	596 000	2 492 445	3 145 000	3 145 000
UNDP(TA): Fellowships							308 101		
Experts and equipment							1 046 565		
							1 354 666		
							3 847 111		

a/ See The Agency's Accounts for 1971 (GOV/1527, Part III, para. 26).

Total price and programme increase by programme, 1972-73

Table V.1

	1972 Budget	1972 Revised budget[a]	Price increase		Programme increase		Total change		1973 Estimate	1974 Preliminary estimate
	$	$	$	%	$	%	$	%	$	$
1. Policy-making organs	711 000	705 000	76 200	10.8	3 800	0.5	80 000	11.3	785 000	834 000
2. Executive management and technical programme planning	354 000	380 000	22 000	5.8	-	-	22 000	5.8	402 000	419 000
3. Technical assistance and training										
Regular Budget	709 000	724 000	56 300	7.7	(5 300)	(0.7)	51 000	7.0	775 000	829 000
Operating Fund II	3 145 000	3 145 000	-	-	-	-	-	-	3 145 000	3 145 000
	3 854 000	3 869 000	56 300	1.4	(5 300)	(0.1)	51 000	1.3	3 920 000	3 974 000
4. Food and agriculture	582 000	621 000	45 200	7.3	36 800	5.9	82 000	13.2	703 000	740 000
5. Life sciences	667 000	730 000	55 400	7.6	10 600	1.4	66 000	9.0	796 000	844 000
6. Physical sciences	792 000	848 000	73 400	8.6	(12 400)	(1.5)	61 000	7.1	909 000	977 000
7. The Laboratory	1 266 000	1 305 000	141 400	10.8	21 600	1.7	163 000	12.5	1 468 000	1 568 000
8. International Centre for Theoretical Physics										
Regular Budget	150 000	150 000	5 000	3.3	-	-	5 000	3.3	155 000	181 000
Operating Fund I	525 000	525 000	46 000	8.7	(20 000)	(3.8)	26 000	4.9	551 000	579 000
	675 000	675 000	51 000	7.5	(20 000)	(2.9)	31 000	4.6	706 000	760 000
9. Nuclear power and reactors	787 000	834 000	69 800	8.3	7 200	0.9	77 000	9.2	911 000	959 000
10. Nuclear safety and environmental protection	704 000	732 000	55 300	7.5	88 700	12.1	144 000	19.6	876 000	891 000
11. International Laboratory of Marine Radioactivity										
Regular Budget	204 000	217 000	24 000	11.1	-	-	24 000	11.1	241 000	259 000
Operating Fund I	45 000	45 000	-	-	-	-	-	-	45 000	45 000
	249 000	262 000	24 000	9.2	-	-	24 000	9.2	286 000	304 000
12. Information and technical services	1 468 000	1 492 000	127 900	8.6	(27 900)	(1.9)	100 000	6.7	1 592 000	1 708 000
13. Safeguards	2 443 000	2 456 000	194 000	7.9	(52 000)	(2.1)	142 000	5.8	2 598 000	3 260 000
14. Service and support activities	916 000	634 000	59 600	9.4	8 400	1.3	68 000	10.7	702 000	734 000
15. Administration	1 807 000	1 955 000	193 600	9.9	(58 600)	(3.0)	135 000	6.9	2 090 000	2 209 000
16. Common services	2 701 000	2 778 000	394 200	14.2	(48 200)	(1.7)	346 000	12.5	3 124 000	3 386 000
17. Adjustment to staff emoluments, including common staff costs	300 000	-	-	-	-	-	-	-	-	-
TOTAL	20 276 000	20 276 000	1 639 300	8.1	(47 300)	(0.2)	1 592 000	7.9	21 868 000	23 567 000
Source of funds:										
Regular Budget	16 561 000	16 561 000	1 593 300	9.6	(27 300)	(0.1)	1 566 000	9.5	18 127 000	19 798 000
Operating Fund I	570 000	570 000	46 000	8.1	(20 000)	(3.5)	26 000	(4.6)	596 000	624 000
Operating Fund II	3 145 000	3 145 000	-	-	-	-	-	-	3 145 000	3 145 000
TOTAL	20 276 000	20 276 000	1 639 300		(47 300)		1 592 000		21 868 000	23 567 000
Regular Budget	16 561 000	16 561 000	1 593 300	9.6	(27 300)	(0.1)	1 566 000	9.5	18 127 000	19 798 000
Less: Income	1 169 000	1 169 000	62 000		146 000		208 000		1 377 000	1 454 000
Assessments on Member States	15 392 000	15 392 000	1 531 300	9.9	(173 300)	(1.1)	1 358 000	8.8	16 750 000	18 344 000

a/ Adjusted for spreading of "contingency", organizational changes, interpretation cost.

Miscellaneous income - Regular Budget

Table V. 2

	1972 Revised budget	Increase or (decrease)	1973 Estimate
(a) Not attributable to specific programmes			
Investment and short-term deposits	130 000	-	130 000
Refund from United Nations Joint Staff Pension Fund	74 000	(6 000)	68 000
Allocation from the United Nations Special Account	175 000	20 000	195 000
Other	70 000	33 000	103 000
Sub-total	449 000	47 000	496 000
(b) Attributable to specific programmes			
Publications of the Agency	298 000	52 000	350 000
INIS publications	40 000	35 000	75 000
Sale of INIS tapes purchased from computer programme funds	5 000	1 000	6 000
CINDA publications	10 000	-	10 000
Advertising	10 000	-	10 000
Laboratory income	45 000	2 000	47 000
Sale of surplus property	3 000	7 000	10 000
IAEA/UNIDO joint services arrangements	309 000	14 000	323 000
Amounts recoverable under safeguards agreements from non-member States	-	30 000	30 000
Reimbursement under Food Irradiation Project	-	20 000	20 000
Sub-total	720 000	161 000	881 000
TOTAL	1 169 000	208 000	1 377 000

Summary of total costs

Table V. 3

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	7 600 373	9 007 500	1 016 000	(142 000)	874 000	9 881 500	10 770 100
Consultants	98 463	120 700	10 100	3 600	13 700	134 400	143 300
Overtime	63 091	33 700	3 200	10 300	13 500	47 200	50 000
Temporary assistance	162 561	118 800	11 200	(15 100)	(3 900)	114 900	129 700
Sub-total	7 924 488	9 280 700	1 040 500	(143 200)	897 300	10 178 000	11 093 100
Common staff costs	2 795 551	3 106 900	186 900	(55 900)	131 000	3 237 900	3 555 600
Travel	329 297	442 700	40 500	(13 200)	27 300	470 000	488 500
Meetings							
Panels and committees	191 774	354 100	33 000	60 900	93 900	448 000	447 500
Seminars, symposia and conferences	212 365	284 000	27 000	(12 500)	14 500	298 500	334 000
Representation and hospitality	42 820	48 600	1 500	700	2 200	50 800	52 300
Scientific and technical contracts	888 736	1 120 000	53 000	8 100	61 100	1 181 100	1 231 100
Scientific supplies and equipment	337 853	315 500	26 000	50 500	76 500	392 000	439 000
Common services, supplies and equipment	1 698 835	1 861 700	219 200	800	220 000	2 081 700	2 240 900
Other items of expenditure	2 796 356	3 461 800	11 700	56 500	68 200	3 530 000	3 685 000
TOTAL	17 218 075	20 276 000	1 639 300 8.1%	(47 300) (0.2)%	1 592 000 7.9%	21 868 000	23 567 000
Source of funds:							
Regular Budget	14 010 024	16 561 000	1 593 300	(27 300)	1 566 000	18 127 000	19 798 000
Operating Fund I	715 606	570 000	46 000	(20 000)	26 000	596 000	624 000
Operating Fund II	2 492 445	3 145 000	-	-	-	3 145 000	3 145 000
TOTAL	17 218 075	20 276 000	1 639 300 8.1%	(47 300) (0.2)%	1 592 000 7.9%	21 868 000	23 567 000

Major components of price increases in the 1973 budget

Table V. 4

Item of expenditure	Regular Budget	Operational Budget	Total
Salaries and wages	1 028 700	11 800	1 040 500
Common staff costs	184 900	2 000	186 900
Travel and meetings	93 500	8 500	102 000
Scientific services, including contracts, supplies and equipment	80 000	10 700	90 700
Common services, supplies and equipment	206 200	13 000	219 200
TOTAL	1 593 300	46 000	1 639 300

Summary of total manpower by grade

Table V. 5

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	1	1	1	-	1	1
DDG/IG	5	5	5	-	5	5
D	19	19	19	-	19	19
P-5	87	90	90	(1)	89	90
P-4	112	120	120	3	123	126
P-3	101	106	106	(3)	103	110
P-2	45	48	48	-	48	57
P-1	30	30	30	(5)	25	25
Sub-total	400	419	419	(6)	413	433
GS	507	517	517	1	518	526
M&O	157	155	155	-	155	161
TOTAL	1 064	1 091	1 091	(5)	1 086	1 120

Summary of total manpower by Department

Table V. 6

Department	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
Office of the Director General	7	8	8	-	8	8
Department of Administration	396	396	407	-	407	415
Department of Research and Isotopes	232	232	227	-	227	227
Department of Safeguards and Inspection	103	126	126	(6)	120	143
Department of Technical Assistance and Publications	173	174	174	1	175	176
Department of Technical Operations	153	155	149	-	149	151
TOTAL	1 064	1 091	1 091	(5)	1 086	1 120

1. POLICY-MAKING ORGANS

Summary of costs

Table V.1.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	436 215	432 500	53 000	-	53 000	485 500	513 000
Consultants	-	-	-	-	-	-	-
Overtime	10 091	6 600	1 000	3 100	4 100	10 700	11 900
Temporary assistance	76 713	50 900	6 000	700	6 700	57 600	64 200
Sub-total	523 019	490 000	60 000	3 800	63 800	553 800	589 100
Common staff costs	156 867	149 500	9 200	-	9 200	158 700	170 000
Travel	-	500	-	-	-	500	600
Meetings							
Panels and committees	-	-	-	-	-	-	-
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	-	-	-	-	-	-	-
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	55 809	58 000	7 000	-	7 000	65 000	66 800
Other items of expenditure	5 952	7 000	-	-	-	7 000	7 500
TOTAL	741 647	705 000	76 200 10.8%	3 800 0.5%	80 000 11.3%	785 000	834 000

Summary of manpower

(A proportional share of the staff of the Division of Languages and Policy-making Organs and of the Division of Publications)

Table V.1.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
D and P	20	20	19	-	19	19
GS	24	24	24	-	24	24
M&O	3	3	3	-	3	3
TOTAL	47	47	46	-	46	46

Summary of manpower by organization unit and category

(A proportional share of the staff of the Division of Languages and Policy-making Organs and of the Division of Publications)

Table V.1.3

	1971 Revised budget				1972 Revised budget				1973 Estimate				1974 Preliminary estimate			
	D and P	GS	M&O	Total	D and P	GS	M&O	Total	D and P	GS	M&O	Total	D and P	GS	M&O	Total
Division of Languages and Policy-making Organs	20	18	-	38	19	18	-	37	19	18	-	37	19	18	-	37
Division of Publications	-	6	3	9	-	6	3	9	-	6	3	9	-	6	3	9
TOTAL	20	24	3	47	19	24	3	46	19	24	3	46	19	24	3	46

THE PROGRAMME

OBJECTIVE

V. 1. 1. In providing services for the Agency's two policy-making organs - the General Conference and the Board - the objective is to make available such staff, facilities and equipment as are required to assist the organs in carrying out their functions effectively and expeditiously.

PLANS FOR 1973-78

V. 1. 2. Throughout the period 1973-78 it is planned to provide services on the same lines as in the past, making such modifications as may be needed to meet the changing requirements of the policy-making organs and introducing such improvements as further experience indicates are desirable, to the extent that the funds that can be made available will allow.

V. 1. 3. In broad terms the services the policy-making organs require may be divided into those needed in preparation for meetings and after meetings, and those to be provided while the organs are actually in session. As to the preparatory work, after the initial, detailed arrangements for meetings have been made, the principal task is to write, translate, print and circulate the provisional agenda and working documents; when a meeting is over, a record of the proceedings is prepared and circulated, first in a provisional form subject to correction, and subsequently as a definitive text. It has not yet been found possible to achieve the timely circulation of the whole of this considerable volume of documentation; while efforts to improve matters will continue, it is recognized both that it is not solely within the power of the Secretariat to control the situation and also that the production of documents in four languages is a highly staff-intensive activity and thus greatly dependent on the availability of funds.

V. 1. 4. For the meetings themselves a wide diversity of services is required. Fully equipped conference rooms must be available and provided with the necessary administrative staff; the proceedings are simultaneously interpreted; précis writers take notes from which to prepare summary records; and a full range of secretarial support is available to facilitate the work being done.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.1.5. It will be seen from Table V.1.3. above that the policy-making organs are mainly serviced by staff in the Division of Languages and Policy-making Organs and the Division of Publications; in the case of the latter Division the contribution to this service is small, but in the case of the former Division it is very considerable [V.1.1].

V.1.6. For 1973, it is planned to upgrade one P-3 post to the P-4 level in the Policy-making Organs Service of the Division of Languages and Policy-making Organs. For 1974 no further change is foreseen.

[V.1.1] See also paras V.14.11-V.14.13 below.

COSTS

V.1.7. The new method of budgeting for interpretation from the funds provided for individual meetings has had the effect of reducing the provision for the policy-making organs by an amount equivalent to one man-year of interpretation costs, as shown in the third column of Table V.1.1 above (1972 Revised budget), with a total corresponding increase in the financial provisions for other meetings.

V.1.8. It will be seen from Table V.1.1 that the total cost of this programme is expected to increase by $ 80 000 in 1973, of which $ 76 200 reflects salary and price increases and $ 3 800 the cost of a programme expansion. The latter amount, will be required for extra overtime and temporary assistance, reflecting actual requirements in 1971.

V.1.9. The estimates of the emoluments of staff to provide supporting services referred to in paragraph V.1.5 above are based on similar assumptions as were used to compute the 1972 revised budget. The increases shown in Table V.1.1 above are partly attributable to rising prices and partly to changes in currency exchange rates.

V.1.10. No expansion of the programme is foreseen for 1974, but the preliminary estimates for that year involve an increase of $ 49 000 in costs, which would be entirely attributable to higher prices and salaries.

Distribution of costs between the General Conference and the Board

V.1.11. The distribution of costs between the General Conference and the Board for the years 1971-1974 is shown below.

Table V.1.4

Policy-making organs	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
General Conference	258 445	317 000	32 600	(600)	32 000	349 000	374 000
Board of Governors	483 202	388 000	43 600	4 400	48 000	436 000	460 000
TOTAL	741 647	705 000	76 200	3 800	80 000	785 000	834 000

2. EXECUTIVE MANAGEMENT AND TECHNICAL PROGRAMME PLANNING

Summary of costs

Table V. 2. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	206 688	228 000	15 900	-	15 900	243 900	255 000
Consultants	2 388	16 000	1 000	-	1 000	17 000	17 600
Overtime	3 323	3 600	300	-	300	3 900	4 000
Temporary assistance	-	300	-	-	-	300	400
Sub-total	212 399	247 900	17 200	-	17 200	265 100	277 000
Common staff costs	76 092	78 500	1 800	-	1 800	80 300	84 100
Travel	19 014	20 400	2 000	-	2 000	22 400	23 700
Meetings							
Panels and committees	6 470	13 000	1 000	-	1 000	14 000	14 000
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	17 255	20 200	-	-	-	20 200	20 200
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	-	-	-	-	-	-	-
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	331 230	380 000	22 000 5.8%	-	22 000 5.8%	402 000	419 000

Summary of manpower

Table V. 2. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	1	1	1	-	1	1
DDG	2	2	2	-	2	2
D	1	1	1	-	1	1
P-5	1	1	1	-	1	1
P-4	-	-	-	-	-	-
P-3	1	1	1	-	1	1
P-2	2	2	2	-	2	2
P-1	1	1	1	-	1	1
Sub-total	9	9	9	-	9	9
GS	7	8	8	-	8	8
M&O	-	-	-	-	-	-
TOTAL	16	17	17	-	17	17

THE PROGRAMME

OBJECTIVE

V. 2. 1. The objective of the Office of the Director General is to propose and implement programmes within the scope of the Agency's statutory objectives, pursuant to decisions of the Board and the General Conference and on the advice of the Scientific Advisory Committee; it is also responsible for the efficient conduct and co-ordination of the Agency's work.

V. 2. 2. The objective of the Offices of the Deputy Directors General for Research and Isotopes and for Technical Operations is to advise and assist the Director General in matters concerning the planning and implementation of the Agency's scientific programmes; they are also responsible for the effective execution of approved programmes within their respective Departments.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 2. 3. No change in the manning table for 1973 or 1974 is foreseen.

COSTS

V. 2. 4. It is expected that the increase in the cost of this programme for 1973, which will be solely attributable to price increases and higher salary rates, will be $22 000. This amount consists of $17 700 for higher salaries and common staff costs in respect of established posts, attributable to normal annual increases and the effects of currency revaluations, $1300 in respect of consultants and overtime, and $3000 in respect of travel and the Scientific Advisory Committee's meeting, mainly resulting from an increase in air fares.

V. 2. 5. The preliminary estimate for 1974 shows an increase of $17 000 over 1973 to cover price increases.

3. TECHNICAL ASSISTANCE AND TRAINING

Summary of costs

Table V.3.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	452 138	517 000	47 500	-	47 500	564 500	595 000
Consultants	1 959	1 000	-	-	-	1 000	1 000
Overtime	294	400	100	-	100	500	500
Temporary assistance	270	500	100	300	400	900	900
Sub-total	454 661	518 900	47 700	300	48 000	566 900	597 400
Common staff costs	166 745	177 900	6 600	-	6 600	184 500	196 400
Travel	15 822	19 000	2 000	(500)	1 500	20 500	22 000
Meetings							
Panels and committees	-	5 000	-	(5 000)	(5 000)	-	10 000
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	2 903	3 200	-	(100)	(100)	3 100	3 200
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	-	-	-	-	-	-	-
Other items of expenditure	2 492 445	3 145 000	-	-	-	3 145 000	3 145 000
TOTAL	3 132 576	3 869 000	56 300 1.4%	(5 300) (0.1%)	51 000 1.3%	3 920 000	3 974 000
Source of funds:							
Regular Budget	640 131	724 000	56 300 7.7%	(5 300) (0.7%)	51 000 7.0%	775 000	829 000
Operating Fund II	2 492 445	3 145 000	-	-	-	3 145 000	3 145 000
TOTAL	3 132 576	3 869 000	56 300 1.4%	(5 300) (0.1%)	51 000 1.3%	3 920 000	3 974 000

Summary of manpower

Table V. 3. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	1	1	1	-	1	1
D	1	1	1	-	1	1
P-5	6	6	6	-	6	6
P-4	9	8	8	-	8	8
P-3	3	3	3	-	3	3
P-2	2	2	2	-	2	2
P-1	-	-	-	-	-	-
Sub-total	22	21	21	-	21	21
GS	30	30	30	-	30	30
M&O	-	-	-	-	-	-
TOTAL	52	51	51	-	51	51

THE PROGRAMME

OBJECTIVE

V. 3. 1. The objective is to promote the transfer of skills and knowledge relating to the peaceful uses of atomic energy, to support the efforts made by recipient countries to carry out their atomic energy activities more efficiently and to ensure that the knowledge acquired can continue to be applied after Agency projects have been completed.

RESULTS TO DATE

V. 3. 2. The programme was initiated in 1958. During the period from 1958 to the end of 1971, the Agency provided technical assistance, financed by it and from other sources, valued at over $39 million. This sum financed the assignments of about 1700 experts and visiting professors in 76 countries, over 4000 fellowship awards for individual study and the provision of equipment and supplies valued at $10 million. In addition, over 2000 persons participated in the 143 regional and interregional projects organized by the Agency.

PLANS FOR 1973-74

V. 3. 3. The technical assistance programme is drawn up on the basis of requests by Governments and reflects priorities established by the Governments themselves. Governments submit their requests, in accordance with a system of integrated

programming, for the three components of technical assistance, viz. experts, equipment, and fellowships and training. These three elements are co-ordinated as far as possible to make the maximum impact on development. The amount of assistance provided from the Agency's own resources will depend on the funds and facilities made available to the Agency.

V.3.4. In 1959, the resources available from Operating Fund II, UNDP and in the form of gifts in kind amounted to about $1 500 000, and it is estimated that these will amount to about $5.5 million in 1972 and that there will be a further increase in 1973. The target for voluntary contributions to the General Fund has been set at $3 million for the period 1972-74. It is expected that in 1972 only 80% of the target will be reached and that it will be possible to meet only some 40% of the requests for experts and equipment.

PLANS FOR 1975-78

V.3.5. It is expected that during the period 1975-78 the technical assistance programme will continue to follow the same general lines as in 1973-74. The assistance to be provided will, of course, be determined by the requests of Governments and the resources contributed by Member States.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.3.6. The system of full country programming has been applied in 1972 for all UNDP national and regional projects. In the current year the Agency is executing eight large-scale projects (formerly of the Special Fund type), and in subsequent years it will execute several additional projects, which Governments now have under consideration. It will also continue to act as a sub-contractor in some large-scale projects for which other United Nations organizations are executing agencies.

V.3.7. Links are being established with other organizations operating bilateral assistance programmes, such as SIDA and NORAD, with a view to increasing the funds available for developing countries introducing nuclear technology. The Agency will continue its joint co-operation programmes financed by SIDA, in particular the sponsoring of training courses of a regional or interregional nature. It is also hoped to collaborate in other bilateral programmes (in field projects involving the assignment of experts and the provision of equipment).

STRUCTURE

V.3.8. This programme consists of two sub-programmes which are dealt with separately below.

SUB - PROGRAMMES

EXPERTS AND EQUIPMENT

OBJECTIVE

V.3.9. The objective is to provide expert assistance and specialized equipment for development projects in Member States.

RESULTS TO DATE

V.3.10. Since the start of the programme about 1700 expert assignments have been carried out and there are now, on average, about 65 experts in the field at any one time. This number is expected to increase.

PLANS FOR 1973-74

V.3.11. It is expected that Governments will continue to stress the need for the assistance of experts and equipment in the application of radioisotopes and radiation in agriculture, medicine and health, including environmental pollution control programmes. There are, however, several Member States which are relatively advanced in the application of nuclear technology in their development programmes and are embarking on nuclear power programmes. Their needs are reflected in requests for specialized, often short-term, assistance relating to nuclear engineering, fuel fabrication, control systems and so forth. With increasing importance being placed in national development plans on the secondary sector, for example industry and mining, many Governments are continuing, or embarking on, nuclear raw materials prospection and development programmes, which are included in their mineral resources inventories or consist of projects specifically confined to radioactive minerals. Assistance is being provided, as appropriate, for these programmes in the form of experts and equipment.

V.3.12. Efforts will continue to be made to help make up for the lack of resources by using, where possible, staff members from the Agency's Headquarters to carry out expert assignments, by identifying projects of a similar nature which could be serviced by the same expert and by arranging periodic visits of relatively short duration by advisers or Headquarters staff in preference to long-term assignments. On request, assistance will be given to Governments in formulating projects and in elaborating the necessary plans of operation. This will be done by Headquarters staff who will, if necessary, work in conjunction with short-term specialized consultants.

PLANS FOR 1975-78

V.3.13. It is expected that during the period 1975-78 the programme will continue to follow the same general lines as in 1973-74.

FELLOWSHIPS AND TRAINING

OBJECTIVE

V.3.14. The objective is to assist Member States in building up their scientific infrastructure with a view to facilitating the application of nuclear technology to economic and scientific development.

RESULTS TO DATE

V.3.15. Since the programme started approximately 4000 fellowships have been awarded and, at any one time, there are approximately 300 fellows studying in host countries.

V.3.16. Nearly 150 training courses have been held, an average in recent years of 17 per year. Every year a few visiting professors are provided and about 15 scientific visits are carried out.

V.3.17. As a result of the panels on nuclear science teaching held in Bangkok in 1968 and Buenos Aires in 1970, technical reports have been published with suggestions for topics in nuclear science for secondary schools and the subjects of courses for future physicists, engineers and science teachers.

PLANS FOR 1973-74

V.3.18. It is expected that about 350 fellowship awards will be made annually.

V.3.19. The application of nuclear technology in developing countries requires teachers trained in the nuclear sciences and qualified to train research workers. There is also a pressing need for middle grade staff and laboratory technicians, and it is expected that Member States will place emphasis on the training of such staff. This will be provided in training courses on a regional level, where group training is appropriate, or by in-service training by an expert. In view of the likelihood that less UNDP funds will be available for regional activities in the future, it is expected that only some 10-14 training courses and study tours will be organized in 1973 and subsequent years.

V.3.20. As the establishment of a scientific infrastructure in developing countries requires a base of trained scientific personnel, the Agency expects to continue to receive requests for visiting professors to teach in universities and research institutes. As their atomic energy programmes become consolidated, it is desirable for developing countries to study the development of nuclear science and technology in more advanced countries, for example, power station management and administration. Provision will, therefore, continue to be made for scientific visits and research fellowships for scientists who have considerable experience and are working on promoting research in their own countries. In 1974, a further panel on nuclear science teaching will be held in co-operation with UNESCO.

PLANS FOR 1975-78

V.3.21. No major changes in the content or scope of the programme are expected.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.3.22. The ILO Training Centre in Turin is being made use of to teach technicians and non-specialist engineers the repair and maintenance of nuclear and electronic instrumentation. Joint panels in nuclear science teaching are held in conjunction with UNESCO. Assistance for a number of training courses and study tours is provided in conjunction with FAO, WHO and SIDA.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.3.23. No change in manpower is foreseen for 1973 or 1974.

COSTS

V.3.24. It is expected that the cost of this programme for 1973 will increase by $51 000 as a result of price increases of $56 300 partly offset by a programme reduction of $5300. Price increases consist of $54 100 in respect of higher salary rates and related common staff costs for established posts, $200 for overtime and temporary assistance and $2000 for travel. The estimate for travel is, however, only increased by $1500, so that there will be a programme reduction of $500. There will be a further programme reduction of $5000 for meetings and $100 for related hospitality owing to the fact that the panel on nuclear science teaching, which is planned for every second year, will not be held in 1973. Since there will be a programme increase of $300 for additional temporary assistance, the net programme reduction will amount to $5300.

V.3.25. The total of the Operational Budget is expected to remain at $3 145 000, of which $3 million represents the target for voluntary contributions, $80 000 the estimated income from investment and $65 000 the estimated refund of local costs of experts.

V.3.26. For 1974 the cost of the programme is expected to increase by $54 000, of which $44 000 will be attributable to salary and other price increases and $10 000 to the panel on nuclear science teaching which will be held in that year.

V.3.27. No change in the total of the Operational Budget for 1974 is foreseen.

4. FOOD AND AGRICULTURE

Summary of costs

Table V.4.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	200 836	225 000	19 500	15 000	34 500	259 500	273 000
Consultants	15 372	15 300	1 700	-	1 700	17 000	18 000
Overtime	-	200	-	-	-	200	200
Temporary assistance	-	1 000	100	-	100	1 100	1 200
Sub-total	216 208	241 500	21 300	15 000	36 300	277 800	292 400
Common staff costs	74 502	77 400	4 500	3 500	8 000	85 400	90 000
Travel	22 407	23 000	2 300	(700)	1 600	24 600	25 800
Meetings							
Panels and committees	28 169	41 000	4 000	(2 000)	2 000	43 000	47 000
Seminars, symposia and conferences	8 437	18 000	2 000	(2 000)	-	18 000	19 500
Representation and hospitality	204	1 100	100	-	100	1 200	1 300
Scientific and technical contracts	215 818	219 000	11 000	23 000	34 000	253 000	264 000
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	-	-	-	-	-	-	-
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	565 745	621 000	45 200 7.3%	36 800 5.9%	82 000 13.2%	703 000	740 000

Summary of manpower

Table V.4.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	- [1] [a]	- [1]	- [1]	-	- [1]	-
P-5	4 [1]	4 [2]	4 [2]	1	5 [2]	5
P-4	7 [4]	7 [3]	7 [3]	(1)	6 [3]	6
P-3	-	-	-	1	1	1
P-2	-	-	-	-	-	-
P-1	-	-	1	(1)	-	-
Sub-total	11 [6]	11 [6]	12 [6]	-	12 [6]	12
GS	8 [6]	8 [6]	8 [6]	-	8 [6]	8
M&O	-	-	-	-	-	-
TOTAL	19 [12]	19 [12]	20 [12]	-	20 [12]	20

a/ FAO staff in brackets. For 1974 the manning table has not yet been approved by FAO.

THE PROGRAMME

OBJECTIVE

V.4.1. The objective is to assist and advise Member States of the Agency and FAO, particularly the developing countries, regarding the use of nuclear techniques in research and development aimed at increasing food production as well as protecting agricultural crops, livestock and products from pests and/or spoilage, special attention being given to preventing pollution of the agricultural environment.

RESULTS TO DATE

V.4.2. The programme has resulted in the collection of practical information on the efficiency of water and fertilizer use, the development of mutant varieties of crops with high-yielding and other improved agronomic attributes, the improvement of animal nutrition and development of radiation-attenuated vaccines, the control of important insect pests, on an experimental level, by the sterile male technique, the promotion of a better understanding of the use of irradiation as a means of food preservation, and an evaluation of the significance of pollution in the agricultural environment.

PLANS FOR 1973-74

V.4.3. The work is primarily concerned with the use of isotopes and radiation in the following activities:

(a) Research on plant nutrition including the role of micronutrients, efficient use of fertilizers and water, especially for cereals and legumes and physiological aspects of plant yield and grain quality;

(b) Mutation breeding for higher yield, better fertilizer response, early maturing, disease resistance and improved protein content of grains;

(c) Studies related to animal nutrition and health, with emphasis on radiation-produced vaccines against parasites;

(d) Application of the sterile male technique for control of noxious insects and related studies of insect physiology and ecology;

(e) Studies of pesticides and other agricultural chemicals in the environment, especially the fate and significance of residues; and

(f) Use of irradiation for the preservation and disinfestation of foods with special reference to the technological, economic, wholesomeness and legislative aspects of the problem.

RELATED ACTIVITIES

V.4.4. The related activities involve the award of a total of about 250 research contracts and agreements, under some 25 co-ordinated programmes. They also involve the provision of analytical and developmental laboratory services and irradiation services for seed samples from Member States. In regard to technical assistance, some 200 requests are expected, seven to nine training courses are foreseen and about 90 fellowships will be granted in the period 1973-74.

PLANS FOR 1975-78

V.4.5. The major activities will continue as indicated for the previous two-year period, with changes in emphasis within the areas, particularly in relation to pesticides and pollution, additional crop species, insect pests, food products and field testing of radiation-attenuated vaccines, sterile insect releases, mutant varieties, and fertilizer and water practices.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.6. The programme which was initiated in 1964 is carried out jointly on behalf of the Agency and FAO and involves co-operation with UNDP in regard to technical assistance and with WHO on food preservation, pollution, entomology and pest control.

STRUCTURE

V.4.7. This programme consists of six sub-programmes which are dealt with separately below.

SOILS, IRRIGATION AND CROP PRODUCTION

OBJECTIVE

V.4.8. The objective is to advise and assist Member States of the Agency and FAO in the application of radiation and isotope techniques in soil fertility, crop nutrition and water use studies.

RESULTS TO DATE

V.4.9. The sub-programme was initiated in 1964. The co-ordinated research projects have yielded valuable information on how to improve the efficiency of water and fertilizer use for rice, wheat, maize and various tree crops.

PLANS FOR 1973-74

V.4.10. The project on wheat fertilization, which was initiated in 1968, will be phased out and replaced by one on the efficiency of conversion of fertilizer nitrogen into grain protein, and the rice project on water management and nitrogen fertilization practices, which commenced in 1970, will be reviewed. Following the final review and phasing-out of the project on tree crop root distribution in 1972, a new project will be initiated involving the practical use of the techniques developed. The project on soil-water regimes will be continued. The study on the effects of low-dose irradiation of seeds will be reviewed. A project on the factors affecting protein production in legume crops will be continued. The progress of the various projects will be reviewed at research co-ordination meetings. The sub-programme will include two panels, a symposium on isotope and radiation in soil physics, irrigation and drainage problems, and possibly a regional seminar.

RELATED ACTIVITIES

V.4.11. The related activities involve the award of some 35 to 45 research contracts and agreements, which will form the basis of three to four co-ordinated programmes. The training of fellows and provision of services of experts and equipment will increase; a training course will be organized on the use of isotopes and radiation techniques in soil research in Latin America in 1974. Advisory services will be provided and two or three special missions will be sent upon request. The Laboratory will perform isotopic analysis of plant samples and provide other supporting services.

PLANS FOR 1975-78

V.4.12. The work concerning soil-water regimes, the efficiency of conversion of nitrogen into grain protein and fertilizer use by legume and tree crops will be continued. New activities on the use of isotopes in fertilizer management studies of other important agricultural food crops, such as millet and sorghum, will be introduced. They will include training courses, expert panels on the effect of water quality on yields, crop water requirements and soil fertility status (salinity), and symposia.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.13. The sub-programme involves co-operation with UNDP and the International Society of Soil Science.

STRUCTURE

V.4.14. This sub-programme consists of five components which are described in the following paragraphs.

The use of isotopes and radiation in wheat fertilization studies

Objective

V.4.15. The objective is to compare the efficiency of fertilizer nitrogen sources as a function of method and time of application under different moisture regimes and determine the efficiency of fertilizer phosphorus utilization as affected by placement and interaction with nitrogen sources.

Results to date

V.4.16. The component was initiated in 1968 and demonstrated that the method of application of fertilizer nitrogen greatly affects its utilization. In many countries it was shown that a simple banding of a nitrogenous fertilizer in the soil doubled its utilization compared with the common practice of broadcasting it on the surface. It was found that the protein content of grain could be greatly increased by the addition of nitrogen and that the most effective time to add nitrogen for wheat was at the early stage.

Plans for 1973-74

V.4.17. The present objectives will be achieved in 1973 and in 1974 the emphasis will be placed on field investigations on the efficiency of conversion of fertilizer nitrogen into grain protein.

Related activities

V.4.18. The related activities involve the award of research contracts and the conclusion of research agreements; 12 to 15 institutes will participate in the co-ordinated programme. The Laboratory will carry out isotopic analysis of plant samples.

Plans for 1975-78

V.4.19. The studies on efficiency of conversion of fertilizer nitrogen into grain protein will be completed in 1978.

The use of isotopes and radiation in rice production studies

Objective

V.4.20. The objective is to study the effect of water management and nitrogen fertilizer practices on the efficiency of nitrogen fertilizer utilization and conversion to protein by new high-yielding varieties of rice.

Results to date

V.4.21. The component was initiated in 1970. In eight countries it was shown that mid-term drainage of the rice paddy had no significant effect on yield of grain or nitrogen uptake. Fertilizer nitrogen, on the average, was used three times more efficiently when applied at the primordial initiation stage of growth than when it was applied at the time of transplanting. In general, ammonium sulphate and urea served as equally good sources of nitrogen for rice.

Plans for 1973-74

V. 4. 22. This project will be reviewed by a combined research co-ordination meeting and panel in 1973 to determine the lines it should follow.

Related activities

V. 4. 23. In the period 1973-74, eight to ten institutes will participate in the co-ordinated research programme. The Laboratory will perform isotopic analysis of plant samples.

Plans for 1975-78

V. 4. 24. The project will be completed in 1975 and the results will be published as a Technical Report in 1976.

The use of isotopes in fertilizer efficiency studies on grain legume crops

Objective

V. 4. 25. The objective is to study the efficiency of fertilizer use by grain legume crops as influenced by source, time and method of application, and the influence of fertilizer nitrogen on nitrogen fixation by the crop.

Results to date

V. 4. 26. The first results of this activity, initiated in 1972, will be available in 1973-74.

Plans for 1973-74

V. 4. 27. The project will be implemented through this period as a co-ordinated research contract programme.

Related activities

V. 4. 28. It is estimated that six to nine institutes will participate in the co-ordinated research programme. The Laboratory will carry out analysis of plant samples and supporting developmental research.

Plans for 1975-78

V. 4. 29. This activity will be phased out by 1977 and the results published as a Technical Report in 1978.

The use of isotopes in fertilizer efficiency studies on tree crops

Objective

V. 4. 30. The objective is to study the efficiency of fertilizer use by tree crops as influenced by factors such as intercropping, interline vegetation, methods of placement and season of application.

Results to date

V. 4. 31. The pattern of root activity of banana, coffee, citrus, cocoa, coconut and oilpalm were evaluated under a previous project initiated in 1967 and terminated in 1972. The information obtained is considered to be essential for subsequent studies on the efficient utilization of commercial fertilizers. In all the tree crops studied, the highest root activity is observed in the upper 30 cm of soil. While coffee, coconut and banana showed highest root activity close to the tree (30-100 cm distance), in cocoa and citrus the

zones of highest activity were further away (100-300 cm). In oilpalms, on the other hand, roots seemed to be equally active at all distances studied (100-400 cm). Root activity in wet seasons was always considerably higher than in dry seasons for all crops.

Plans for 1973-74

V.4.32. The project will be initiated and implemented in 1973-74, with emphasis on practical fertilizer problems.

Related activities

V.4.33. Some eight to ten institutes are to take part in the co-ordinated research programme. The Laboratory services envisaged include the analysis of plant samples and other supporting research work.

Plans for 1975-78

V.4.34. This project will continue until 1978, when it will be reviewed by a panel of experts and the results published.

The use of isotopes and radiation techniques in studies of soil-water regimes

Objective

V.4.35. The objective is to develop improved means for controlling the dynamics of soil-water in the field as a basis for better use of soil and water resources in agriculture.

Results to date

V.4.36. Suitable experimental sites have been selected, soil characteristics have been determined, and equipment has been purchased and calibrated.

Plans for 1973-74

V.4.37. The project will be carried out in many Member States having water shortage problems. The use of nuclear techniques in the in situ characterization of the physical and hydraulic properties of soil profiles will be intensified. Nuclear techniques applicable to water balance studies will be developed.

Related activities

V.4.38. Some eight to twelve institutes will participate in the programme by carrying out research contracts and agreements. Several requests for technical assistance are expected in 1973-74.

Plans for 1975-78

V.4.39. The project will continue until 1977; the work to be done as from 1975 will be based on the recommendations of a panel.

Co-operation with other organizations

V.4.40. This component may involve co-operation with UNDP in the implementation of a regional project.

PLANT BREEDING AND GENETICS

OBJECTIVE

V.4.41. The objective is to assist and advise Member States on the use of radiation and isotope techniques in plant improvement.

RESULTS TO DATE

V.4.42. Many technical problems relating to mutagenic treatment, like the dosimetry of neutron seed irradiation, have been solved since the sub-programme was initiated in 1964 and several techniques have been standardized. Co-ordinated international mutant variety performance and yield trials have resulted in the increased use of high-yielding durum wheat varieties in the Near East and Mediterranean countries. Mutation breeding has made remarkable contributions to crop plant improvement; it is estimated that the use of more than 100 mutant varieties has increased farm incomes by at least $50 million annually. Development of computer systems for standardized field trials and research on computerized storage and retrieval of gene pools have been recognized internationally as important pioneering activities. For the first time, a manual on mutation breeding has been published.

PLANS FOR 1973-74

V.4.43. Assistance and advice in mutation breeding will continue to be provided through correspondence and missions. It is planned to hold one symposium, two expert panels and at least one training course. The research contract programme will focus on techniques for seed protein improvement and for breeding disease-resistant crop varieties. Special attention will be paid to the development of suitable methods of inducing mutations in vegetatively propagated crops and perennial crops. The work will be reviewed at research co-ordination meetings.

RELATED ACTIVITIES

V.4.44. It is planned to award 35 to 45 research contracts and agreements, which will form the basis of three or four co-ordinated programmes. Requests for experts and training are expected to increase. The Laboratory will organize a training course on mutation breeding techniques and carry out mutagen treatment of seeds and protein analysis of breeding material and research on improvement of mutation breeding methods and their standardization.

V.4.45. The Federal Republic of Germany supports a large project on plant protein improvement, contributing to research contracts, laboratory activities and co-ordination.

PLANS FOR 1975-78

V.4.46. In research on seed protein improvement and disease resistance, the emphasis may shift to special aspects of nutritional quality and pathogen resistance of crop plants and, by 1976, to specific crops or urgent breeding requirements. Research activities on better use of irradiation and isotope techniques in plant breeding will continue; the manual on mutation breeding will be updated.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.47. The sub-programme involves co-operation with UNDP, EUCARPIA, SABRAO, the European Society for Nuclear Methods in Agriculture, EURATOM, and the Gesellschaft für Strahlen und Umweltforschung (Radiation Environmental Research Organization, Munich, Federal Republic of Germany).

STRUCTURE

V.4.48. This sub-programme consists of five components which are described in the following paragraphs.

Seed protein improvement through nuclear techniques

Objective

V. 4. 49. The objective is to improve seed protein of major food crops like cereals and pulses.

Results to date

V. 4. 50. The first results of this work, which was initiated in 1971, are expected by 1973-74.

Plans for 1973-74

V. 4. 51. The project will involve the radiation treatment of seeds, screening of induced mutants, and the improvement of methods of screening. Progress will be reviewed at annual research co-ordination meetings.

Related activities

V. 4. 52. The component will involve the award of research contracts and agreements to some 15 to 20 institutes. Three to five fellowships will be awarded and the services of two or three experts may be provided. The Laboratory will perform chemical analysis and radiation treatments of seeds and develop mass screening methods.

Plans for 1975-78

V. 4. 53. The project will continue at least until 1976, when emphasis might be shifted to particular crops and more basic problems of protein biosynthesis and nutrition.

Co-operation with other organizations

V. 4. 54. This activity involves co-operation with the Radiation Environmental Research Organization in regard to the joint project. Progress is reported to the Protein Advisory Group of the United Nations.

Induced mutations for disease resistance in crop plants

Objective

V. 4. 55. The objective is to develop disease-resistant varieties of crop plants through the use of induced mutations.

Results to date

V. 4. 56. Results are not expected before 1973-74, since the work was initiated in 1971.

Plans for 1973-74

V. 4. 57. The work will consist of the radiation treatment of seeds to induce mutants with improved disease resistance and the development of new and more efficient mass-screening methods and better utilization of resistant varieties.

Related activities

V. 4. 58. Some 15 to 20 research contracts and agreements will be awarded in 1973-74. The services of two or three experts will be provided and some fellows will be trained.

The Laboratory will carry out mutagen treatments and developmental research on behalf of the contractors.

Plans for 1975-78

V. 4. 59. The project will be continued until 1976, when a meeting will be held to review the progress achieved in the project and in the closely related research fields of plant pathology, genetics and breeding.

Mutation breeding techniques

Objective

V. 4. 60. The objective is to improve techniques for induction, selection and utilization of mutants in plants.

Plans for 1973-74

V. 4. 61. Emphasis will be placed on techniques for selection and utilization of induced mutants in order to foster the application of mutation breeding. A symposium to review the status of mutation breeding and related research fields is planned for 1974.

Related activities

V. 4. 62. It is expected that some 15 to 20 research contracts and agreements will be placed in 1973-74. The training of three or four fellows at the Seibersdorf Laboratory and the provision of the services of two or three experts are envisaged.

V. 4. 63. The services to be rendered by the Laboratory will include mutagen treatments and standardization of techniques.

Plans for 1975-78

V. 4. 64. The project activities will be continued until 1977, when they will be terminated in their present form and the new direction determined on the basis of the results obtained.

Co-operation with other organizations

V. 4. 65. This component involves co-operation with SABRAO and EUCARPIA.

Mutation breeding of vegetatively propagated and perennial crops

Objective

V. 4. 66. The objective is to breed superior varieties using induced mutations and to improve the technology of induction and utilization of mutations for vegetatively propagated and perennial crops.

Plans for 1973-74

V. 4. 67. The project will be organized as a co-ordinated research programme in line with the above objective, and will include annual or biennial co-ordination meetings.

Related activities

V. 4. 68. In the related research contracts and agreements programme, some 12 to 15 institutes will participate. The award of a few fellowships and the provision of the services of some experts are envisaged for 1973-74. The Laboratory will carry out mutagen treatment and methodological research.

Plans for 1975-78

V. 4. 69. The work will include co-ordination meetings each year, and the provision of services by the Laboratory, including selection and testing of mutant lines. It is expected that the project will be terminated by 1978.

Co-operation with other organizations

V. 4. 70. Meetings will be organized in co-operation with EUCARPIA and SABRAO.

Rice mutation breeding

Objective

V. 4. 71. The objective is to develop superior varieties of rice through the use of induced mutations and to improve rice mutation breeding technology.

Results to date

V. 4. 72. This component was initiated in 1972. An earlier programme resulted in the development of six new varieties and a significant improvement in mutation breeding techniques in South East Asia. Many improved lines are ready to be used as new varieties. They represent a significant improvement over the best local varieties of IR 8 either in yield/hectare, earliness, productivity/day or protein yield/hectare.

Plans for 1973-74

V. 4. 73. This project will concern itself primarily with the solution of specific breeding problems resulting from the Green Revolution, e. g. diseases, pests and poor quality.

Related activities

V. 4. 74. Some 10 to 15 institutes will participate, in 1973-74, in the research contracts and agreements programme. The training of two or three fellows at the Seibersdorf Laboratory is envisaged. The Laboratory services to be provided include mutagen treatment and developmental work on techniques.

Plans for 1975-78

V. 4. 75. The work will emphasize testing and releasing of mutant varieties and will be completed by 1977.

Co-operation with other organizations

V. 4. 76. The project is carried out within the framework of the International Rice Commission in association with the International Rice Research Institute and SABRAO.

ANIMAL PRODUCTION AND HEALTH

OBJECTIVE

V. 4. 77. The objective is to advise and assist Member States in applying isotopes and radiation for animal production and health.

RESULTS TO DATE

V. 4. 78. The sub-programme was initiated in 1966. The use of tracers and of neutron activation analysis have made possible the determination of both deficiencies and excess of

trace minerals in livestock. A better understanding of metabolic interrelationships and disorders has been gained, particularly in regard to calcium, phosphorus, magnesium, iron, copper, zinc, manganese, cobalt and selenium.

V.4.79. Radiation-attenuation of vaccines is, in some cases, being applied on a commercial scale.

PLANS FOR 1973-74

V.4.80. The programme will aim at the substitution of dietary protein by non-protein nitrogen sources in high-energy rations for ruminants and at the quantitative assessment of metabolic processes and requirements under such feeding conditions. A research co-ordination meeting is planned and a training course will be organized.

V.4.81. Work will continue in order to improve and apply in field tests radiation-attenuated vaccines against parasitic diseases which, so far, cannot be eradicated or treated by other means. The aetiology and immunology of such diseases will be studied. A symposium on this subject is planned.

RELATED ACTIVITIES

V.4.82. The related activities will include the award of 20 to 25 research contracts and agreements, the organization of two training courses and the grant of about 20 fellowships. Some ten countries are expected to formulate requests for technical assistance. The Laboratory will carry out determinations of nitrogen-15.

PLANS FOR 1975-78

V.4.83. The activities aiming at the improvement and intensification of livestock production with high-energy and protein-substituted diets will continue. The animal health activities will include large-scale field applications of vaccines in selected endemic areas.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.84. The sub-programme involves co-operation with UNDP.

STRUCTURE

V.4.85. This sub-programme consists of two components which are described in the following paragraphs.

Animal nutrition and physiology

Objective

V.4.86. The objective is to help improve animal production by using isotopes in studies of animal nutrition and physiology.

Results to date

V.4.87. This component was initiated in 1972. In a previous five-year programme, the metabolism and kinetics of major minerals and trace minerals were studied in order to recognize and avoid limitations of livestock production caused by nutrient deficiencies, imbalance and oversupplies. The results are described in a number of scientific publications. A training manual was prepared.

Plans for 1973-74

V.4.88. A co-ordinated programme will deal with the use of isotopes in studies of non-protein nitrogen and of pre-treated proteins in high-energy diets for ruminants, thus permitting the quantitative assessment of protein synthesis in the ruminant's forestomach. The first results are expected in this two-year period.

Related activities

V.4.89. Some 12 to 15 institutes will be participating in the research contracts and agreements programme. Animal nutrition and physiology aspects are studied in UNDP projects in India and Lebanon and will be dealt with, provided approval is obtained, in projects in Cuba and Nigeria. The Laboratory will carry out nitrogen-15 analyses.

Plans for 1975-78

V.4.90. Research on the use of isotopes in attempts to develop further economic and effective feeding systems on a high-energy/low-plant protein basis, with the maximum use of cheap non-protein nitrogen compounds, will be continued. Special emphasis will be placed on systems to be developed for areas with non-temperate climates. Research on rumen metabolism will be intensified.

Co-operation with other organizations

V.4.91. The component involves co-operation with UNDP.

Parasitology and animal diseases

Objective

V.4.92. The objective is to apply radiation and tracers in the production of vaccines against parasitic diseases and in studies on their aetiology, pathogenesis and immunology.

Results to date

V.4.93. Under this component, which was initiated in 1966, effective and safe radiation-attenuated vaccines have been developed and applied in large field trials in India and Iraq against lungworms in sheep and goats. In laboratory and field tests such vaccines have provided various degrees of immunity against some protozoal diseases (e.g. East Coast fever, trypanosomiasis, caccidiosis, babesiosis) and helminthic infestations (liver fluke, haemonchiasis, syngamosis). Diagnostic improvements were made with regard to schistosomiasis and new pathogenetic and immunological findings were reported.

Plans for 1973-74

V.4.94. With regard to the preparation of radiation-attenuated vaccines, it is planned to continue studies in countries where the above-mentioned diseases are endemic and to carry out large-scale screening and field tests with vaccines which are now being developed. More emphasis will be laid on problems of immunity and aetiology, since highly sensitive and accurate tracer methods are now becoming available. A consultants' meeting and a symposium are planned.

Related activities

V.4.95. The related activities involve the award of 12 to 15 research contracts and agreements in 1973-74. Technical assistance projects will be carried out in India, Mali and probably Lebanon.

Plans for 1975-78

V. 4. 96. Based on new achievements in tracer methodology, the activities will increasingly concentrate on diagnostic procedures and immunological studies to support efforts to develop vaccines against parasitic and possibly viral diseases of animals.

Co-operation with other organizations

V. 4. 97. The component involves co-operation with UNDP.

INSECT ERADICATION AND PEST CONTROL

OBJECTIVE

V. 4. 98. The objective is to assist and advise Member States of the Agency and FAO on the use of radiation and isotopes in the control of insects and other pests in agriculture.

RESULTS TO DATE

V. 4. 99. This sub-programme was initiated in 1964. Experiments in the laboratory and in the field have indicated that the Mediterranean fruit fly can be controlled by releasing sterile males. Considerable progress has been made on mass rearing and radiation sterilization of the olive fly. Rice stem borers can be sterilized. Data from tagged Heliothis indicated that they migrate more than previously suspected. Furthermore, an artificial membrane for feeding tsetse flies has been developed and artificial feeding involving the use of freeze-dried blood appears promising.

PLANS FOR 1973-74

V. 4. 100. Research on specific topics will be conducted through co-ordinated programmes. The Information Circular on radiation techniques and their application to insect pests will continue to be issued. Panels and a symposium will be convened. The efforts directed towards the practical application of the sterile male technique for control of the Mediterranean fruit fly, olive fly, and tsetse fly will be continued in line with the recommendations to be made by a review panel in 1972.

RELATED ACTIVITIES

V. 4. 101. A number of research contracts and agreements will be concluded within the framework of three to four co-ordinated programmes. A training course and a study tour will be organized and the Laboratory will participate in this sub-programme by training fellows and by carrying out developmental and supporting research.

PLANS FOR 1975-78

V. 4. 102. Emphasis may gradually shift both to other insects that are susceptible to control by the sterile male technique and to tracer applications in ecology and insect physiology. Training will continue on the application of established techniques to control pests. A symposium and panels are foreseen.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 4. 103. The sub-programme involves co-operation with WHO in regard to mosquitoes and tsetse flies, the Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA) in the Medfly field project and UNDP.

STRUCTURE

V.4.104. This sub-programme consists of four components which are described in the following paragraphs.

The use of the sterile male technique against rice stem borers

Objective

V.4.105. The objective is to determine whether it is possible to apply the sterile male technique to rice stem borers.

Results to date

V.4.106. This component was initiated in 1968. Three species of rice stem borers have been maintained on artificial media. Some winter mortality factors have been determined, as have sterilization dosages. One of the major problems identified at the second co-ordination meeting was the inability to mass-rear rice stem borers on artificial diets.

Plans for 1973-74

V.4.107. A review of the rice stem borer programme will be made. It will be determined at that time whether this programme should be continued or replaced by a feasibility study on the control of another economically important insect of significance to developing countries.

Related activities

V.4.108. Eight to ten institutes will participate in the programme of research contracts and agreements. The Laboratory will take part in developmental research on principles of the sterile male technique and on all aspects of rearing of lepidoptera and will provide training for fellows.

Plans for 1975-78

V.4.109. In the work for 1975-78, emphasis may be shifted to the use of the sterile male technique against another insect.

Development of the use of the sterile male technique against fruit flies

Objective

V.4.110. The objective is to promote and co-ordinate research and exchange of information on all aspects of the sterile male technique for control of fruit flies.

Results to date

V.4.111. This activity, which was initiated in 1969, has demonstrated that the sterile male technique is applicable against the Mediterranean fruit fly in several countries. Rearing of the olive fly has progressed to the point that field experiments are now possible. Significant progress in the rearing and sterilization of the cherry fruit fly and other species of fruit flies has been made.

Plans for 1973-74

V.4.112. Research will be carried out by research contractors on important fruit fly pests other than the Mediterranean fruit fly to determine the feasibility of using the sterile male technique. A meeting to review the progress achieved will be held. Those countries wishing to proceed with field programmes will be given technical advice.

Related activities

V.4.113. Some 10 to 15 institutes are expected to participate in the research contracts and agreements programme. In 1973-74, three to five fellowships and the services of a few experts will be provided. The Laboratory will carry out research for developmental and programme support.

Plans for 1975-78

V.4.114. This project will be terminated or reorganized following the review meeting.

Co-operation with other organizations

V.4.115. This component involves co-operation with the Organisation Internationale de Lutte Biologique contre les Animaux et les Plantes Nuisibles and OIRSA.

Ecology and behaviour of the species in the Heliothis complex as related to the sterile male technique

Objective

V.4.116. The objective is to obtain information on the behaviour, dispersion and migration, population dynamics, host relationships and diapause and to determine the species in the Heliothis complex in different countries.

Results to date

V.4.117. Studies initiated in 1969 have shown that Heliothis migrate longer distances than was previously believed. Rearing procedures have been largely worked out for one species involved but not for the other two. Radiation dosages necessary to induce sterility have been determined.

Plans for 1973-74

V.4.118. Research on mass rearing, radiation sterilization and ecology will be carried out through contracts and agreements and progress will be reviewed at a research co-ordination meeting.

Related activities

V.4.119. Some eight to ten institutes will participate in the research contracts and agreements programme.

Plans for 1975-78

V.4.120. If it is established in a review of the work, to be made at the end of 1974, that the majority of the objectives have been achieved, the work will be terminated.

Development of the sterile male technique against tsetse flies

Objective

V.4.121. The objective is to develop the use of the sterile male technique against tsetse flies by obtaining and evaluating data on a satisfactory mass-rearing method, on the ecology of the pest and on sterilization and competitiveness.

Results to date

V.4.122. Rearing of the tsetse fly in large numbers, the most difficult problem in this project, has been partially solved in the work done under this component, which was

initiated in 1970. The use of artificial membranes with either freeze-dried or defibrinated blood shows much promise. Radiation dosages necessary to sterilize tsetse flies have been determined and tests have shown that the sexual competitiveness of sterile male tsetse flies is comparable to that of normal males.

Plans for 1973-74

V.4.123. Research work related to ecology, artificial rearing and radiation sterilization will be carried out through contracts and agreements. Progress will be reviewed at a research co-ordination meeting.

Related activities

V.4.124. About six institutes will participate in the research contracts and agreements programme. The training of a few fellows at the Seibersdorf Laboratory is foreseen for the two-year period 1973-74. The Laboratory will provide services related to developmental research in support of field programmes.

Plans for 1975-78

V.4.125. This project should be terminated by the end of 1975. A new project to be recommended by a panel may be initiated subsequently.

Co-operation with other organizations

V.4.126. The component involves co-operation with WHO and the International Centre of Insect Physiology, Kenya.

PESTICIDE RESIDUES AND POLLUTION

OBJECTIVE

V.4.127. The objective is to advise and assist Member States in the use of isotopes and radiation for studying problems of chemical and radioactive contamination of food and pollution in agriculture.

RESULTS TO DATE

V.4.128. The sub-programme, which was initiated in 1969, has yielded results on the distribution, chemical and biological fate of pesticides and other potentially hazardous environmental chemicals, e.g. fumigant residues in food and mercury residues in soil and aquatic systems.

PLANS FOR 1973-74

V.4.129. Co-ordinated research programmes will be continued on the fate and significance of foreign substances in food and in the environment; a panel on this subject is also planned. A regional training course on isotope tracer techniques for studying pesticide residue problems in Latin America will be organized. Collection and dissemination of information on radiometric instrumentation and the supply of labelled compounds will be continued. The results of a world-wide monitoring of radioactive food contamination, with particular reference to the needs of UNSCEAR, will be reviewed.

V.4.130. A seminar will be held in collaboration with WHO and a panel on pesticide residues and other agricultural pollutants in soil and ground water systems will be organized jointly with the Section of Soil Fertility, Irrigation and Crop Protection.

RELATED ACTIVITIES

V.4.131. Research contracts and agreements will be awarded under two co-ordinated programmes, each involving 10 to 15 institutes. Field projects will be implemented in Brazil, Ethiopia, Uganda, Venezuela and possibly in Colombia and Peru. The number of fellowships will increase and a training course on pesticide residues will be organized in 1973-74.

PLANS FOR 1975-78

V.4.132. Expert panels will determine the direction of projects and the extent to which the emphasis in future projects should be shifted toward nuclear applications in studies of microbiological conversion mechanisms. A symposium will be organized and the publication of periodical summaries on chemical residues continued.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.133. This sub-programme involves co-operation with WHO in holding meetings, IUPAC on pesticide residues and pollution, UNDP in field projects and training activities and UNSCEAR in the collection and interpretation of data on radioactive contaminants in food and agriculture.

STRUCTURE

V.4.134. This sub-programme consists of two components which are described in the following paragraphs.

Isotopic tracer aided studies of the fate and significance of foreign substances in food and in the agricultural environment

Objective

V.4.135. The objective is to obtain quantitative information on the persistence, nature and significance of pesticide and other chemical residues in food and in the agricultural environment as an essential basis for the formulation of international recommendations for limiting and controlling such residues, for the protection of food crops and wild life, and for the effective use of agricultural chemicals for pest control.

Results to date

V.4.136. This component was initiated in 1969. Quantitative information has been obtained in relation to pesticides and fumigant residues in food and in the soil. This information is made available to the joint FAO/WHO programme on pesticide residues. Data have also been obtained on the fate and significance of toxic elements such as mercury and cadmium in aquatic systems.

Plans for 1973-74

V.4.137. Co-ordinated research work will be continued on the fate and significance of foreign substances in food and in the agricultural environment coupled with research co-ordination meetings.

Related activities

V.4.138. Research contracts and agreements will be awarded under two co-ordinated research programmes, with 10 to 15 institutes participating in each.

Plans for 1975-78

V. 4. 139. Under this component various classes of persistent pesticides will be studied in succession. Pending the results of a panel in 1976, the work will focus on other toxic elements.

Co-operation with other organizations

V. 4. 140. This work involves co-operation with IUPAC and WHO in regard to the organization of meetings.

Collection and dissemination of comparative information on the fate and significance of foreign substances (including radioactive substances) in food and agriculture

Objective

V. 4. 141. The objective is to provide concise information in order to permit the comparison of global inputs and the nature and significance of all foreign substances (including radioactive substances) appearing in food and in the agricultural environment. This information is essential for the establishment of realistic priorities and for the identification of research needs.

Results to date

V. 4. 142. Although this exercise has only just commenced as the result of the recommendations of a panel of experts, it promises to provide information of considerable value to United Nations organizations concerned with the environment.

Plans for 1973-74

V.4. 143. These activities will be continued along the lines recommended by expert panels concerned with the co-ordinated research programmes.

Plans for 1975-78

V. 4. 144. The work in question is of a continuing nature, but will be adjusted to meet the needs of UNSCEAR and to take into account the characteristics of pollution in food and agriculture.

Co-operation with other organizations

V. 4. 145. This component involves co-operation with several United Nations and other international organizations. The review and interpretation of data related to levels of radioactive substances in food is expected to be of interest to UNSCEAR for incorporation into its periodic reports.

FOOD PRESERVATION

OBJECTIVE

V. 4. 146. The objective is to advise and assist Member States of the Agency and FAO regarding the use of ionizing radiation for the preservation of food.

RESULTS TO DATE

V. 4. 147. The sub-programme was initiated in 1964. Ionizing radiation has been found effective in the elimination of pathogenic and spoilage bacteria from food without the use

of heat, the disinfestation of agricultural products without leaving chemical residues, and the extension of the market life of fish, fruits and vegetables without altering the characteristics of the fresh products. Temporary international acceptance of irradiated wheat and wheat products and potatoes for human consumption was recommended by a Joint FAO/IAEA/WHO Expert Committee on Wholesomeness of Irradiated Foods in 1969.

PLANS FOR 1973-74

V.4.148. Research programmes will continue on food disinfestation, preservation of fish, fruits and vegetables and control of animal parasites in food. The usefulness of ionizing radiation treatment in reducing quarantine periods for agricultural products will be investigated. International acceptance of additional irradiated food items will be sought through the collection and dissemination of information and through the International Food Irradiation Project on Wholesomeness Testing. In co-operation with WHO, a panel will be held to review progress and to make recommendations on clearance of food items. Special missions will advise Governments, upon request, regarding the organization and conduct of irradiation work on food and feed.

RELATED ACTIVITIES

V.4.149. The sub-programme will involve the award of research contracts and agreements under two or three co-ordinated programmes. A training course on food preparation will be organized in 1973 or in 1974.

PLANS FOR 1975-78

V.4.150. It is expected that early in this period clearance for human consumption of several additional types of irradiated food will be obtained. This should stimulate the use of the irradiation process in the food industry. The rising concern regarding the increase in chemical residues in man's environment, and especially in food, should further enhance the interest in this process. Further wholesomeness studies will be undertaken.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.4.151. The sub-programme involves co-operation with WHO on wholesomeness, UNDP in relation to technical assistance, and OECD(NEA) in international wholesomeness testing.

STRUCTURE

V.4.152. This sub-programme consists of six components which are described in the following paragraphs.

Disinfestation and shelf-life extension of fruits and vegetables

Objective

V.4.153. The objective is to investigate the effect of radiation on the shelf-life extension of fruits and vegetables and the role of irradiation in solving quarantine problems.

Results to date

V.4.154. The component was initiated in 1969. The results obtained so far show that ionizing radiation is a promising means of extending the storage life of perishable products.

Plans for 1973-74

V.4.155. Research on the radiation preservation of mangoes, papayas, strawberries and dates will continue until 1974. Thereafter, the results will be reviewed by a panel and, on the basis of the results obtained, other fruits and vegetables which show promise, will be selected.

Related activities

V.4.156. Research contracts and agreements will be awarded to the seven to ten institutes participating in the programme. The provision of the services of a few experts and some equipment is envisaged.

Plans for 1975-78

V.4.157. The scope of the work for this period will be determined by the conclusions reached by a panel.

Co-operation with other organizations

V.4.158. The component involves co-operation with WHO in programme co-ordination.

Preservation of fishery products by irradiation

Objective

V.4.159. The objective is to extend the market life of various fishery products.

Results to date

V.4.160. The component was initiated in 1969. The results obtained under research contracts and Government projects on scampi, shrimp and cod have shown that ionizing radiation can be used effectively to preserve such sea-food and thus facilitate its transport to markets.

Plans for 1973-74

V.4.161. The project will be completed in 1974 when attention will be directed to other marine and fresh-water species, as recommended by a panel.

Related activities

V.4.162. About ten to twelve institutes will participate in the research contracts and agreements programme. The provision of the services of experts, equipment and fellowships is expected to increase in this two-year period.

Plans for 1975-78

V.4.163. The future orientation of this work will be determined by the conclusions of a panel to be held in 1974 or 1975.

Co-operation with other organizations

V.4.164. This component involves co-operation with WHO in programme co-ordination.

Elimination of micro-organisms harmful to health

Objective

V.4.165. The objective is to eliminate harmful organisms from food and feed by irradiation.

Results to date

V. 4. 166. The component was initiated in 1970. Results obtained under research contracts undertaken within the framework of the project have shown that ionizing radiation could be used to rid food of organisms that constitute health hazards. Progress was made in the devitalization of parasites, radicidation treatment of Salmonella, control of Clostridia and inactivation of viruses. The results have been published in the Panel Proceedings series.

Plans for 1973-74

V. 4. 167. Investigations on the application of ionizing radiation to eliminate harmful organisms from food and feed will be continued, including work on the use of radiation to control animal parasites in food.

Related activities

V. 4. 168. The work will involve the award of research contracts and agreements to some seven to ten institutes. It is expected that some requests for technical assistance will be received.

Plans for 1975-78

V. 4. 169. Pending the outcome of a review scheduled for 1975, a new project is expected to be initiated which will include the collection of economic data on pilot plants and on commercial operation.

Co-operation with other organizations

V. 4. 170. The component involves co-operation with WHO in programme co-ordination.

International project in the field of food irradiation

Objective

V. 4. 171. The objective is to assist national and international authorities in their consideration of the acceptance of irradiated food.

Results to date

V. 4. 172. This project was initiated in 1971. As a result of the recommendations of a Joint FAO/IAEA/WHO Expert Committee on Wholesomeness of Irradiated Food, eight countries have cleared irradiated wheat and wheat products for human consumption.

Plans for 1973-74

V. 4. 173. Studies on wheat and wheat products and potatoes which have been requested by the Joint FAO/IAEA/WHO Expert Committee on Wholesomeness of Irradiated Food will be carried out and additional irradiated products for wholesomeness testing will be selected. Research on the means of determining the wholesomeness of irradiated food and the dissemination of information on wholesomeness testing will be carried out. Assistance will be offered to national and international authorities in their consideration of acceptance of irradiated food.

V. 4. 174. In co-operation with WHO, a panel of experts will be held in 1974 to review progress in obtaining clearance and to recommend selected irradiated food items for clearance.

Plans for 1975-78

V. 4. 175. The project will continue for an initial period of five years. Its continuation beyond this period will be determined by decision of the 21 participating countries.

Co-operation with other organizations

V.4.176. OECD(NEA) acts as co-sponsor of the project and WHO in an advisory capacity.

Reduction of microbial contamination of food conditioners by radiation treatment

Objective

V.4.177. The objective is to reduce microbial contamination of food ingredients capable of spoiling the final product even if used in small concentrations.

Results to date

V.4.178. Earlier work on food ingredients such as spices, texture aids, sugar and colouring substances, has shown that elimination of microbial contamination and infestation from these products greatly improved microbial stability of the final food product. Heating or chemicals cannot usually be applied to the above products for decontamination.

Plans for 1973-74

V.4.179. Research will be co-ordinated on the reduction of microbial contamination in some spices, starch preparations, texture improvers, and food colours. Work will include the determination of the doses required for efficient decontamination, as well as the measurement of any chemical, flavour or taste changes caused by various doses of irradiation.

Related activities

V.4.180. The related activities include the award of research contracts and agreements to some five institutes.

Plans for 1975-78

V.4.181. Work will continue on these ingredients and be extended to any others which may present a microbiological problem.

Co-operation with other organizations

V.4.182. The work involves co-operation with WHO in regard to wholesomeness testing and organization of meetings.

Co-ordinating centre for the collection of wholesomeness and legislation data on irradiated food

Objective

V.4.183. The objective is to provide Member States of the Agency and FAO, upon their request, with current information related to the wholesomeness of and legislation on irradiated food in order to secure the approval of such food.

Results to date

V.4.184. This activity was initiated in 1971. A questionnaire requesting information on wholesomeness of and legislation on irradiated food was sent to Member States: a certain number of replies has been received.

Plans for 1973-74

V.4.185. Information concerning national legislation on the licensing of irradiated food for human consumption and data relating to the wholesomeness of such food will be provided to Member States in a computerized index.

Plans for 1975-78

V.4.186. This activity is of a continuing nature.

Co-operation with other organizations

V.4.187. This component involves co-operation with WHO in regard to wholesomeness.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.4.188. Under the Food Irradiation Project an additional P-3 post will be required in 1973 for an assistant to the project leader, the cost of this post will be reimbursed to the Agency. Since the survey of the utilization and deployment of staff carried out in 1971 showed that there was a redundant P-1 post in another programme, this post has been transferred to the Joint Division in the revised manning table for 1972; thus, it will only be necessary to upgrade the post to the P-3 level in 1973. A P-4 post will be upgraded to the P-5 level for the head of the Food Irradiation Section. Therefore no new posts will need to be added to the manning table.

V.4.189. No changes in manpower are proposed for 1974.

COSTS

V.4.190. For 1973 it is expected that the cost of this programme will increase by $82 000 of which $45 200 will be required to cover salary and price increases and $36 800 represents a programme increase. Higher salary rates and related common staff costs for established posts account for an increase of $24 000 and the cost of consultants' services and temporary assistance will increase by $1800. Price increases in respect of travel, meetings and related hospitality in the amount of $8400 are partly offset by a programme reduction of $4700 in respect of these items. The increase for research contracts is $34 000, of which $11 000 will be required to cover price increases.

V.4.191. The programme increase of $18 500 in respect of salaries and related common staff costs represents the cost of a P-3 post for the Food Irradiation Project, which is reimbursable to the Agency and is offset under miscellaneous income. Although only the upgrading of an existing P-1 post will be required, the full cost of the post has to be added since no funds were included in the revised budget for 1972.

V.4.192. For 1974 it is foreseen that the cost of this programme will increase by $37 000, which will be entirely attributable to salary and price increases.

COMBINED FAO/IAEA SUPPORT

V.4.193. For 1973 the staff provided by FAO to the Joint Division will consist of the Director and five Professional officers. Funds for GS posts are provided under contractual services.

V.4.194. It is to be noted that the budget for FAO is prepared on a biennial basis and that the biennial programme of FAO covers different years from those of the Agency. For this reason no estimates are available for 1974.

Contribution by FAO towards the financing of the activities of the Joint FAO/IAEA Division

Table V. 4. 3

	Approved budget 1970-71 $	Increase or (decrease) $	Estimates 1972-73 $
Salaries for Professional staff	177 050	93 150	270 200
Common staff costs	90 300	9 850	100 150
Consultants	38 100	-	38 100
Duty travel	23 500	-	23 500
Contractual services and equipment[a/]	101 700	27 600	129 300
Meetings	83 100	(83 100)	--[b/]
Documents	26 250	3 500	29 750
Total	540 000	51 000	591 000

a/ Including GS staff salaries.

b/ The cost, amounting to $83 100, is included under Salaries and Contractual services and equipment on the basis of CCAQ's expenditure classification.

5. LIFE SCIENCES

Summary of costs

Table V. 5. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	248 715	281 000	28 800	(18 000)	10 800	291 800	306 000
Consultants	10 377	12 800	1 200	2 000	3 200	16 000	17 600
Overtime	-	200	-	-	-	200	200
Temporary assistance	212	1 600	-	(1 600)	(1 600)	-	-
Sub-total	259 304	295 600	30 000	(17 600)	12 400	308 000	323 800
Common staff costs	92 324	97 100	4 800	(5 800)	(1 000)	96 100	101 000
Travel	15 246	15 000	1 500	-	1 500	16 500	17 600
Meetings							
Panels and committees	20 151	45 000	4 000	(3 000)	1 000	46 000	47 000
Seminars, symposia and conferences	16 454	34 000	3 000	(3 000)	-	34 000	36 000
Representation and hospitality	746	1 300	100	-	100	1 400	1 600
Scientific and technical contracts	218 328	242 000	12 000	40 000	52 000	294 000	317 000
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	117	-	-	-	-	-	-
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	622 670	730 000	55 400 7.6%	10 600 1.4%	66 000 9.0%	796 000	844 000

Summary of manpower

Table V. 5. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	1	1	1	-	1	1
P-5	4	4	4	-	4	4
P-4	6	6	6	-	6	6
P-3	1	1	1	-	1	1
P-2	-	-	-	-	-	-
P-1	2	2	2	-	2	2
Sub-total	14	14	14	-	14	14
GS	10	10	9	-	9	9
M&O	-	-	-	-	-	-
TOTAL	24	24	23	-	23	23

THE PROGRAMME

OBJECTIVE

V.5.1. The objective is to foster the development of methods and techniques for the application of radioisotopes in medicine and biology, with special reference to the needs of developing countries.

RESULTS TO DATE

V.5.2. This programme was initiated in 1958. The results to date are described in the relevant paragraphs relating to the sub-programmes and components of the programme which are set out below.

V.5.3. In relation to those results it is of interest to note that, in medical applications, the selection of subjects to be dealt with is made in agreement with WHO. Preference is given to subjects which are of special interest to developing countries or which, because of their complexity, require international co-operation and stimulation of the work involved.

V.5.4. In radiation biology, the work relating to the improvement of micro-organisms for industrial applications and radiation sterilization of medical products is of special interest to developing countries because the results achieved in research have an immediate impact on the economy of those countries.

V.5.5. In radiation dosimetry, the work relating to medical radiation dose intercomparison and computer-assisted radiotherapy is especially helpful to developing countries because of the lack of highly-trained scientists in those countries.

PLANS FOR 1973-78

V.5.6. It is considered that more effective work can be done by concentrating the efforts in the research contract programme on fewer topics which are to be investigated more thoroughly. This would be reflected in a relative increase in co-ordinated research programmes. Co-ordinated research programmes have the additional advantage of allowing the provision of a more effective service for the research work by means of co-ordinated research meetings.

V.5.7. In establishing co-ordinated research programmes, preference is given to co-ordinating the research work of laboratories on a regional basis in order to facilitate the exchange of results and to make such programmes less expensive. The selection of topics for symposia and panels takes into account the topics of co-ordinated research programmes.

V.5.8. Laboratory services are provided to support the research work. In particular the Medical Applications Laboratory at the Agency's Headquarters provides services for the work on iron nutrition and inter-laboratory comparison of radioimmunoassay measurements. For the dosimetry work, the Dosimetry Laboratory at Headquarters provides the relevant services. The Computer Section provides services for the intercomparison of computer-assisted scintigraphic techniques and computer-assisted radiotherapy. The Seibersdorf Laboratory provides services for the medical applications of activation analysis.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.5.9. This programme involves co-operation with WHO, IARC, ICRU and ICSH.

STRUCTURE

V.5.10. This programme consists of three sub-programmes which are dealt with separately below.

SUB - PROGRAMMES

MEDICAL APPLICATIONS

OBJECTIVE

V.5.11. The objective is to provide assistance and advice to Member States, in particular developing countries, in the application of radioisotopes in medicine and to make available training methods and procedures and some specialized equipment for work with radioisotopes in preventive and clinical medicine as well as in medical research.

RESULTS TO DATE

V.5.12. The various projects have resulted in improvements in instrumentation, for example through the design of an inexpensive whole-body counter and the development of better criteria for evaluation of collimators used in scintigraphy, and improvements in techniques, for example through the successful application of radioisotope techniques in epidemiological studies, the standardization of techniques for thyroid function studies, the standardization of radioisotope procedures in haematology, the inter-laboratory comparison of radioimmunoassay measurements, and the intercomparison of techniques for computer-assisted scintigraphy.

PLANS FOR 1973-74

V.5.13. The work will include:

(a) Applications of radioisotopes in nutrition studies;

(b) Medical applications of activation analysis;

(c) Applications of radioisotopes in microbial immunology;

(d) Functional studies with radioisotopes in clinical medicine and research;

(e) In vitro procedures with radioisotopes in clinical medicine and research; and

(f) Medical radioisotope scintigraphy.

RELATED ACTIVITIES

V.5.14. The related activities involve approximately 50 research contracts and 20 research agreements most of which relate to five co-ordinated research programmes. About 20 requests for experts and 50 requests for fellowships for 1973 are expected. An increase in the number of both types of request of 5% per year thereafter is expected. It is planned to convene jointly with WHO a working group on standardization of procedures in nuclear medicine in 1973. It is also proposed to hold jointly with WHO a seminar on training in nuclear medicine in 1974.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.5.15. This sub-programme involves co-operation with WHO in three joint co-ordinated research programmes, IARC in the elaboration of techniques and other services provided by the Agency, and ICSH in the drafting of recommendations.

STRUCTURE

V.5.16. This sub-programme consists of six components which are described in the following paragraphs.

Applications of radioisotopes in nutrition studies

Objective

V.5.17. The objective is to promote the applications of radioisotopes in nutrition studies, particularly in studies of iron-deficiency anaemia.

Results to date

V.5.18. This component was initiated in 1969. An inexpensive whole-body counter has been designed and four of its kind have been built in the Medical Applications Laboratory and delivered to institutes in developing countries participating in the co-ordinated research programme. Two sets of plans of the counter have been sent upon request to other laboratories in developing countries. Techniques for measuring iron absorption from a mixed meal have been developed.

Plans for 1973-74

V.5.19. The absorption of iron will be further studied and attempts to improve iron nutrition will be continued. A panel to review radioisotope methods for measuring gastrointestinal absorption of other nutrients in the diet will be convened in 1973.

Related activities

V.5.20. The related activities involve ten research contracts, one technical contract and one research agreement, seven of which relate to a co-ordinated research programme. The requests for assistance expected are mentioned in paragraph V.5.14 above. The Laboratory will continue to provide analytical services, develop and test whole-body counting techniques, and support the co-ordinated research programme.

Plans for 1975-78

V.5.21. The investigations relating to iron nutrition will be phased out. The initiation of work on the absorption of other nutrients is under consideration in consultation with WHO.

Co-operation with other organizations

V.5.22. There is a joint IAEA/WHO co-ordinated research programme on iron nutrition.

Medical applications of activation analysis

Objective

V.5.23. The objective is to promote the applications of activation analysis in studies of the aetiology of disease.

Results to date

V.5.24. This component was initiated in 1965. Preliminary results relating to the role of trace elements in cardiovascular diseases, cancer, malnutrition, goitre and other diseases have been obtained. Relevant analytical techniques have been developed in the Medical Applications Laboratory.

Plans for 1973-74

V.5.25. Special emphasis will be placed on the joint IAEA/WHO co-ordinated research programme on trace elements in cardiovascular diseases.

Related activities

V.5.26. The related activities involve two research contracts and three research agreements, four of which relate to a co-ordinated research programme. The requests for assistance expected are mentioned in paragraph V.5.14 above. The Laboratory will continue to provide analytical services, develop and test analytical techniques, provide standard analytical reference and intercomparison materials and support the co-ordinated research programme.

Plans for 1975-78

V.5.27. The work on trace elements in cardiovascular diseases will be phased out. The initiation of work on their role in other diseases will be considered in consultation with WHO.

Co-operation with other organizations

V.5.28. This component involves co-operation with WHO in a joint IAEA/WHO co-ordinated research programme on trace elements in cardiovascular diseases, which was initiated in 1969, and with IARC in the elaboration of techniques and measurement of 300-600 samples per year in connection with studies relating to the role of trace elements in cancer.

Applications of radioisotopes in microbial immunology

Objective

V.5.29. The objective is to promote the applications of radioisotopes in microbial immunology, particularly in studies of communicable diseases.

Results to date

V.5.30. This component was initiated in 1970. Initial results indicate that radioisotope techniques can be successfully applied in epidemiological studies.

Plans for 1973-74

V.5.31. Following the recommendations of the panel on applications of radioactive tracer techniques in microbial immunology, which was convened in 1971, the Agency will continue to support research in this subject, especially in epidemiological aspects of infectious diseases, the early diagnosis of viral diseases and the detection of hidden or masked forms of infectious diseases. A section of the symposium on radioimmunoassay and related techniques to be held in 1973 will be devoted to the applications of radioisotopes in microbial immunology.

Related activities

V.5.32. The related activities involve six research contracts, three of which relate to a co-ordinated research programme. The requests for assistance expected are

mentioned in paragraph V. 5. 14 above. The Laboratory will continue to provide support for the co-ordinated research programme.

Plans for 1975-78

V. 5. 33. The current work will be phased out. Future activities in the subject will depend upon the results obtained and the evaluation of WHO.

Co-operation with other organizations

V. 5. 34. This component involves co-operation with WHO in a joint IAEA/WHO co-ordinated research programme on the use of labelled antigens in serological epidemiology which was initiated in 1970.

Functional studies with radioisotopes in clinical medicine and research

Objective

V. 5. 35. The objective is to advise and assist Member States in the applications of radioisotopes in functional studies in clinical medicine and research.

Results to date

V. 5. 36. This component was initiated in 1959. Panel reports and the proceedings of a symposium on the subject have been published.

Plans for 1973-74

V. 5. 37. A panel on radioisotope renography will be convened in 1973 and a panel with ICSH on the standardization of radioisotope procedures in diagnostic haematology in 1974. A symposium on dynamic functional studies with radioisotopes in clinical medicine and research is planned for 1974.

Related activities

V. 5. 38. The related activities involve five research contracts on cardiovascular studies. The requests for assistance expected are mentioned in paragraph V. 5. 14 above.

Plans for 1975-78

V. 5. 39. A continuing demand for advice and assistance relating to the subject is foreseen. A further symposium may be held in 1978.

Co-operation with other organizations

V. 5. 40. This component involves co-operation with ICSH and with its panel on radioisotope procedures in diagnostic haematology in drafting recommendations, and with WHO in holding scientific meetings and other activities.

In vitro procedures with radioisotopes in clinical medicine and research

Objective

V. 5. 41. The objective is to advise and assist Member States in the applications of radioisotopes in in vitro procedures in clinical medicine and research.

Results to date

V. 5. 42. This component was initiated in 1969. The proceedings of a symposium on the subject have been published. An international training course on radioimmunoassay

techniques has been held particularly for the benefit of developing Member States. An inter-laboratory comparison of radioimmunoassay measurements embracing 20 laboratories is in progress.

Plans for 1973-74

V.5.43. The present work will continue with an increased emphasis on radioimmunoassay procedures aimed at the determination of small non-proteic molecules of biological significance. A symposium on radioimmunoassay and related techniques is planned for 1973. A further international training course on radioimmunoassay techniques is planned for 1974.

Related activities

V.5.44. The related activities involve 15 research contracts which relate to a co-ordinated research programme. The requests for assistance expected are mentioned in paragraph V.5.14 above. The Laboratory will continue to provide support services for inter-laboratory comparisons of radioimmunoassay measurements.

Plans for 1975-78

V.5.45. A continuing demand for advice and assistance relating to the subject is foreseen. The development of new techniques as well as the standardization of reagents and techniques is expected to influence the programme of work. A further symposium may be held in 1977.

Co-operation with other organizations

V.5.46. This component involves co-operation with WHO in regard to scientific meetings and other activities.

Medical radioisotope scintigraphy

Objective

V.5.47. The objective is to advise and assist Member States in the applications of radioisotopes in scintigraphy.

Results to date

V.5.48. This component was initiated in 1959. The proceedings of four symposia on the subject have been published. A laboratory programme to evaluate the performance of multi-hole collimators used in scintigraphy has been completed. A co-ordinated research programme for the intercomparison of computer-assisted scintigraphic techniques has been initiated. Technical support has been given to the radiopharmaceuticals programme of the Chemistry Section (see paragraphs V.6.19-V.6.24 below).

Plans for 1973-74

V.5.49. The co-ordinated research programme on the intercomparison of computer-assisted scintigraphic techniques will be continued. A regional training course on scintigraphic techniques is planned for 1974. Further support will be given to the radiopharmaceuticals programme of the Chemistry Section.

Related activities

V.5.50. The related activities involve ten research contracts and 17 research agreements, 18 of which relate to a co-ordinated research programme. The requests for assistance expected are mentioned in paragraph V.5.14 above. The Laboratory will continue to provide support services for the co-ordinated research programme.

Plans for 1975-78

V.5.51. A continuing demand for advice and assistance relating to the subject is foreseen. A further symposium may be held in 1976.

Co-operation with other organizations

V.5.52. This component involves co-operation with WHO in regard to scientific meetings and other activities.

DOSIMETRY FOR INTENTIONAL RADIATION APPLICATIONS

OBJECTIVE

V.5.53. The objective is to assist and advise Member States in relation to dosimetric problems and procedures for intentional radiation applications. These procedures cover a range of 100 rads to 5000 rads of single exposure in the medical field, and 10 000 to 5 000 000 rads in the field of food preservation and sterilization.

RESULTS TO DATE

V.5.54. The postal dose intercomparison service has helped to improve dosimetry in a large number of radiotherapy institutions. About 300 institutes in Member States have participated so far. Twenty per cent of all participants have shown that their dosimetry varies by $\pm$ 10%, and 9% that it varies by $\pm$ 25%.

V.5.55. A training course on dosimetry in radiotherapy was held in Puerto Rico in 1970 and a training course on dosimetry for industrial and agricultural processing establishments was held in Bangkok in 1971. A Manual of Dosimetry in Radiotherapy (Technical Reports Series No. 110), a Directory of High-Energy Radiotherapy Centres (1970) and a number of other publications have been issued.

PLANS FOR 1973-74

V.5.56. The current work in medical dosimetry intercomparison will be continued and extended to cover agricultural and industrial radiation applications.

V.5.57. The availability of a cobalt-60 source will enable the Laboratory to continue to provide the following services:

(a) Calorimetric calibration of high-energy radiation absorbed doses;

(b) Supply of calibrated ionization chambers to Member States on request;

(c) Distribution of ferrous sulphate dosimeters to institutes in Member States; and

(d) Thermoluminescence dosimeter (TLD) intercomparison; the TLD powder for each intercomparison batch will be calibrated by the Dosimetry Laboratory.

An irradiation service up to 5000 rads with the cobalt-60 source will continue to be available.

PLANS FOR 1975-78

V.5.58. It is planned to continue the work done in 1973-74, together with dosimetry for neutron irradiation in medical, radiobiological and agricultural applications. The

individual activities which will be continued will depend on the interest expressed by Member States and WHO.

V.5.59. Three requests for experts and five requests for fellowships per year are expected.

V.5.60. The Laboratory will calibrate dosimeters and assess the results of the postal intercomparison service. Some dosimeter devices are made at Headquarters.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.5.61. This sub-programme involves co-operation with WHO in regard to medical dosimetry.

STRUCTURE

V.5.62. This sub-programme consists of five components which are described in the following paragraphs.

Cobalt-60 medical postal dose intercomparison

Objective

V.5.63. The objective is to check the effectiveness of the cobalt-60 medical postal dose intercomparison in radiotherapy centres with a view to improving the effectiveness of radiation treatment in Member States.

Results to date

V.5.64. This component was initiated in 1968. About 300 institutions in over 50 Member States have participated in the work in question. About 20% of all participants have shown that their dosimetry varies by $\pm$ 10%, and 9% that it varies by $\pm$ 25%.

Plans for 1973-74

V.5.65. The postal dose intercomparison service will be extended to cover radiation energies other than that of cobalt-60 by using other types of dosimeters and radiation sources.

V.5.66. Symposia on luminescence dosimetry and on recent advances in high-energy particle dosimetry are planned in consultation with the Division of Nuclear Safety and Environmental Protection.

Related activities

V.5.67. The related activities involve five research contracts on the following subjects: development of new dosimetric techniques; improvement of existing dosimetric techniques; direct methods of measurement of absorbed dose; calibration and intercomparison of standardization of selected types of dose measurements; and biophysical aspects of radiation quality and microdosimetry. Three to five requests for assistance are expected per year. A training course on dosimetry relating to radiotherapy techniques for radiotherapy personnel is envisaged. The Laboratory services are set out in paragraph V.5.57 above.

Plans for 1975-78

V.5.68. The continuation of this programme will depend on the interest expressed by Member States and WHO. It is expected to phase out the ^{60}Co part by 1978.

Co-operation with other organizations

V.5.69. This component involves co-operation with WHO in a joint project.

Dose intercomparison service for large industrial and food processing radiation sources

Objective

V.5.70. The objective is to improve and standardize dosimetric procedures used in industrial and food processing plants, and to establish a dose intercomparison service for large industrial irradiation equipment.

Results to date

V.5.71. This component was initiated in 1971. A meeting of experts in September 1971 discussed the technological aspects of international standardization of large radioisotope sources. Means to carry out dose comparison services are being formulated.

Plans for 1973-74

V.5.72. Suitable dosimetry systems such as the existing "perspex" foils will be developed. A pilot intercomparison scheme will be organized. A symposium on advances in dosimetry of high intensity and pulsed radiation fields and a panel on radiation dosimetry of large radioisotope sources are planned. The safety aspects of those topics will be studied in consultation with the Division of Nuclear Safety and Environmental Protection.

Related activities

V.5.73. The related activities involve five research contracts on the following subjects: development of new dosimetric techniques; improvement of existing dosimetric techniques; direct methods of measurement of absorbed dose; and calibration and intercomparison of standardization of selected types of dose measurements. The requests for assistance expected are mentioned in paragraph V.5.67 above. A study tour on radiation calibration facilities is foreseen. Laboratory services will be provided in co-operation with national laboratories or at Headquarters.

Plans for 1975-78

V.5.74. Dose intercomparison services may be offered to Member States by 1975 and continued at the level requested. It is expected that they will be phased out by 1978.

Computerized teletherapy dosimetry service

Objective

V.5.75. The objective is to facilitate and improve treatment plans in radiotherapy by the use of computers, and to provide, in co-operation with advanced institutes, suitable computer programmes to radiotherapy clinics in developing countries.

Results to date

V.5.76. This component was initiated in 1970. Comprehensive computer programmes have been worked out in co-operation with institutions in various countries with the Agency as a collector and distributor of such programmes. Pilot studies are carried out with institutions in Kuwait and Panama.

Plans for 1973-74

V.5.77. The pilot studies will be extended to additional countries. Furthermore, the programme library will be used in the existing medical radiation data service. A panel on advances in computer technology for dealing with radiation dosimetry problems will be held.

Related activities

V.5.78. The related activities involve four to six research contracts and six agreements. Requests for the services of three or four experts are expected.

Plans for 1975-78

V.5.79. Programmes evaluated in pilot studies will be made available to developing countries and services in applying these programmes will be provided. A continuation of this work after 1978 will depend on the requests of Member States.

Neutron dosimetry for intended medical applications

Objective

V.5.80. The objective is to improve and standardize dosimetry methods for fast neutrons and mixed neutron-gamma fields used in radiotherapy and radiobiological studies.

Results to date

V.5.81. This component was initiated in 1966. Standardized procedures for neutron and mixed neutron-gamma dosimetry have been developed.

Plans for 1973-74

V.5.82. Thorough investigation of the dosimetry problems associated with neutron and mixed neutron-gamma irradiation will be carried out, with emphasis on neutron dose distributions and dose equivalents in biological substances caused by californium-252 sources of different geometrical arrangements. A symposium on advances in neutron and mixed neutron-gamma ray dosimetry will be held.

Plans for 1975-78

V.5.83. Dosimetric techniques developed for routine use and for standardization purposes will be made available, as needed. This work is expected to continue after 1978.

Physical data for radiation dosimetry, radiation biology and radiation therapy

Objective

V.5.84. The objective is to collect, review and periodically publish physical data concerning the interaction process between radiation and matter, with emphasis on radiation application in biology and medicine.

Plans for 1973-74

V.5.85. An international working group on physical data for radiation dosimetry, radiation biology and radiation therapy, if formed in 1972, will collect, critically review and publish physical data related to the interaction process between charged particles and matter. Participation of the Division of Nuclear Safety and Environmental Protection in this working group is foreseen.

Related activities

V.5.86. The related activities involve three research contracts and three research agreements.

Plans for 1975-78

V.5.87. It is hoped that responsibility for the work in question will be taken over by an international committee; in that event it would be terminated in the Agency.

Co-operation with other organizations

V.8.88. This component, which was initiated in 1972, involves the exchange of information with ICRU and financial support of ICRU by the Agency.

RADIATION BIOLOGY

OBJECTIVE

V.5.89. The objective is to encourage research on the fundamental mechanisms of radiation damage and repair in living systems that have applications in medicine, industry and agriculture.

RESULTS TO DATE

V.5.90. This sub-programme was initiated in 1960. Knowledge and data have been exchanged and several panel reports and symposia proceedings have been published.

PLANS FOR 1973-74

V.5.91. It is planned to carry out work, which is described in paragraphs V.5.96-V.5.125 below, on radiation sterilization of biomedical products and biological tissues, radiation microbiology, radiation attenuation of toxins and infective agents for preparation of vaccines, radiation biology of neutrons and heavy particles, and environmental radiation biology. The work on environmental radiation biology will complement the work on environmental protection done by the Division of Nuclear Safety and Environmental Protection and will therefore be carried out in conjunction with that Division. The latter Division will be responsible for work dealing with the interaction of nuclear pollutants resulting from the increased use of nuclear power with the biological environment (radiation bioecology), whereas the Division of Life Sciences will be responsible for work dealing with the application of nuclear techniques and biological methods for the improvement of biosphere resources and the management of non-nuclear pollutants of the environment.

PLANS FOR 1975-78

V.5.92. The work relating to radiation attenuation of toxins and infective agents for preparation of vaccines and radiation biology of neutrons and heavy particles will continue. The scope of this work will be determined in the light of scientific consultation and the results expected to be achieved.

V.5.93. It is expected that the radiation sterilization work will be concluded in 1975 and that, in 1976, the radiation microbiology work will be reduced and incorporated in a programme on management of non-nuclear pollutants of the environment which will form part of the work on environmental radiation biology.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 5. 94. This sub-programme involves co-operation with WHO in joint meetings and consultations, UNESCO and IAMS in joint meetings and the co-ordination of programmes, EURATOM and WMO (consultations), and FAO in agricultural applications of neutrons.

STRUCTURE

V. 5. 95. As indicated in paragraph V. 5. 91 above, this sub-programme consists of five components which are described in the following paragraphs.

Radiation sterilization of biomedical products and biological tissues

Objective

V. 5. 96. The objective is to elaborate criteria for the safe and reliable use of ionizing radiation for sterilization of biomedical products and for preservation of transplantable biological tissues.

Results to date

V. 5. 97. This component was initiated in 1967. Biological monitoring systems have been developed, consisting of suitable radioresistant spore-forming and vegetative bacterial cells, for the assessment of radiation sterilization processes. A recommended code of practice for radiosterilization of medical products and a radiation sterilization manual were published in 1972.

Plans for 1973-74

V. 5. 98. Research on the subject in question will be supported. A working group will be convened in 1973 and 1974 to elaborate international standards and determine requirements for the use of radiation sterilization procedures and quality and sterility control methods.

V. 5. 99. Two working group meetings and a panel of experts on the effects of irradiation on antigenic properties of proteins and biological tissues will be convened.

Related activities

V. 5. 100. The related activities will involve four to six new research contracts and agreements on radiosterilization methods for new types of medical devices and biomedical products, the antigenic alterations induced by sterilizing doses in biological materials, and the possible increase of radioresistance in micro-organisms which survive radiation sterilization. Six requests for assistance are expected. A second regional training course will be arranged. The Laboratory will provide biological monitoring materials and evaluate the efficiency of sterilizing procedures.

Plans for 1975-78

V. 5. 101. A symposium on radiation sterilization of biomedical products and their utility in medical practices and a third regional training course are planned.

Co-operation with other organizations

V. 5. 102. Working group meetings are jointly organized with WHO.

Radiation microbiology

Objective

V.5.103. The objective is to utilize radiation and radioactive isotopes to create and characterize mutant micro-organisms of use in industrial processes.

Results to date

V.5.104. This component was initiated in 1970. The book entitled "Radiation and Radio-isotopes for Industrial Micro-organisms" has been published.

Plans for 1973-74

V.5.105. The work on this subject will be continued, with emphasis on the selection of mutant micro-organisms capable of producing citric acid, tetracycline, and single-cell protein from inexpensive carbon and nitrogen sources which are present in local agricultural and domestic wastes.

Related activities

V.5.106. The related activities involve 11 research contracts on the use of mutant micro-organisms obtained by irradiation to produce, for example, protein from the carob bean in Greece and from cassava in Nigeria, and citric acid from molasses in India and Pakistan. Ten requests for assistance are expected.

Plans for 1975-78

V.5.107. The research contract programme will continue at approximately the same level and a study tour on industrial irradiation microbiology is planned. It is also planned to hold the fourth and fifth regional training courses during this period.

Co-operation with other organizations

V.5.108. This component involves co-operation with UNESCO, WHO and IAMS on consultations on the work programme.

Radiation attenuation of toxins and infective agents for preparation of vaccines

Objective

V.5.109. The objective is to elaborate methods and techniques for using ionizing radiation to reduce toxicity of animal poisons, including snake venoms, and the pathogenicity and proliferative capactiy of micro-organisms and human parasites so that these attenuated agents can be used for the preparation of efficient vaccines.

Results to date

V.5.110. This component was initiated in 1969. The proceedings of the Panel on Radiation Sensitivity of Toxins and Animal Poisons were published in 1970.

Plans for 1973-74

V.5.111. The current work will be extended and the main emphasis will be shifted to the development of vaccines against helminth parasites, such as Schistosoma, and against some protozoan infections including malaria, trypanosomiasis and leishmaniasis which are widespread in developing countries, particularly in tropical areas. The work will be harmonized with similar work done by the Agency in veterinary medicine. A joint WHO/IAEA panel of experts on the application of nuclear techniques in research and control

of parasitic diseases will be convened in 1973. Several consultants' meetings are foreseen for the purpose of evaluating possibilities of using radiation in the preparation of vaccines against malaria and other protozoan infections.

Related activities

V.5.112. The related activities involve six to ten research contracts. Four requests for assistance are expected.

Plans for 1975-78

V.5.113. Depending on the results obtained, the work may be extended to cover the preparation of vaccines against certain bacterial diseases, such as cholera, typhus and some viral infections.

Co-operation with other organizations

V.5.114. Meetings are jointly organized with WHO.

Radiation biology of neutrons and heavy particles

Objective

V.5.115. The objective is to promote application of the biological effects of neutrons and heavy particles in agriculture, medicine and other areas of practical importance and co-ordinate the work of scientists concerned with this subject.

Plans for 1973-74

V.5.116. In this component, which was initiated in 1972, research work will be undertaken to develop and make available standard irradiation facilities and recommendations for fast neutron dosimetry and spectrometry as well as for biological monitoring systems. Biological research will be aimed at the evaluation and interpretation of the dependence of the relative biological efficiency of neutrons on the distribution of dose in time, the biological object used, the radiobiological end-points studied and the environmental conditions prevailing after the exposure. A symposium on the effects of neutrons on cell functions is planned for 1973.

Related activities

V.5.117. The related activities involve five research contracts and three research agreements. A training course on radiobiological methods in life sciences (including neutron dosimetry) and a study tour on utilization of reactors for biomedical research will be arranged.

Plans for 1975-78

V.5.118. The work will be reviewed and will depend on the results achieved and the requests for assistance received.

Co-operation with other organizations

V.5.119. This component involves co-operation with WHO in the radiotherapeutical application of fast neutron beams, and with FAO in the agricultural application of neutrons.

Environmental radiation biology

Objective

V.5.120. The objective is to develop and encourage applications of nuclear techniques for improvement of biosphere resources and the management of non-nuclear pollutants of biological origin.

Results to date

V.5.121. As stated in paragraph V.5.91 above, this component, which was initiated in 1972, complements the work on environmental protection done by the Division of Nuclear Safety and Environmental Protection. One research contractor has demonstrated that ionizing radiation alters the relative numbers of the different species of micro-organisms in the secondary purification process for sewage.

Plans for 1973-74

V.5.122. A working group will be convened in 1974 to consider the applications of nuclear techniques for the management of non-nuclear pollutants of the environment. It is planned to hold a panel on the use of nuclear techniques in the management of waste of biological origin.

Related activities

V.5.123. The related activities involve about ten research contracts and agreements. Four requests for assistance are expected. A study tour on radiation biology research in environmental studies will be organized.

Plans for 1975-78

V.5.124. It is expected that work under this component will expand and that emphasis will be placed on those activities that hold out the promise of useful developments in the applications of nuclear techniques for the management of fresh water pollutants.

Co-operation with other organizations

V.5.125. Consultations on the work programme are held with FAO, UNESCO, WHO, WMO and EURATOM.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.5.126. One GS post has been transferred from this programme to the Physical Sciences programme in the revised manning table for 1972. No further changes in the manning tables for 1973 and 1974 will be required.

COSTS

V.5.127. For 1973 it is expected that the cost of this programme will increase by $66 000, of which $55 400 represents estimated salary and other price increases and $10 600 the cost of a small programme expansion. Of the price increases, $33 600 will be required to meet the cost of higher salaries and related common staff costs, $1200 for consultants' services, $1500 for travel (mainly as a result of the increase in air fares), $7100 for meetings and related hospitality (partly offset by a programme reduction of $6000) and $12 000 for scientific and technical contracts, for which there is, in addition, a programme increase of $40 000. Of the latter amount, $5000 represents an increase to $9000 in the funds available for the technical contract with ICRU.

V.5.128. Although no change in the manning table for 1973 is foreseen, there will be a programme reduction of $23 800 in respect of salaries and related common staff

costs as compared with the revised budget for 1972, which covered the cost of the services of a staff member for whom a post had been made available under another programme and for which no provision is made in the estimate for 1973.

V.5.129. A programme increase of $2000 in funds for consultants is largely offset by the elimination of a provision of $1600 for temporary assistance.

V.5.130. For 1974 an increase of $48 000 is foreseen, of which about $10 000 can be considered as a programme increase.

6. PHYSICAL SCIENCES

Summary of costs

Table V.6.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	348 800	417 000	44 700	(12 000)	32 700	449 700	472 000
Consultants	18 257	19 000	1 300	3 000	4 300	23 300	25 600
Overtime	25	300	-	-	-	300	300
Temporary assistance	-	2 000	-	(2 000)	(2 000)	-	-
Sub-total	367 082	438 300	46 000	(11 000)	35 000	473 300	497 900
Common staff costs	129 045	143 600	7 300	(3 600)	3 700	147 300	155 800
Travel	16 364	30 000	3 000	(1 000)	2 000	32 000	33 200
Meetings							
Panels and committees	32 191	66 500	6 000	(1 000)	5 000	71 500	78 000
Seminars, symposia and conferences	26 896	37 000	4 000	2 000	6 000	43 000	46 000
Representation and hospitality	1 446	1 700	100	100	200	1 900	2 100
Scientific and technical contracts	122 344	109 000	6 000	15 000	21 000	130 000	136 000
Scientific supplies and equipment	-	15 000	-	(15 000)	(15 000)	-	17 000
Common services, supplies and equipment	111	6 900	1 000	2 100	3 100	10 000	11 000
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	695 479	848 000	73 400 8.6%	(12 400) (1.5%)	61 000 7.1%	909 000	977 000

Summary of manpower

Table V.6.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	1	1	1	-	1	1
P-5	5	5	5	-	5	5
P-4	6	6	6	-	6	6
P-3	8	8	8	-	8	8
P-2	2	2	2	-	2	2
P-1	1	1	1	-	1	1
Sub-total	23	23	23	-	23	23
GS	15	15	16	-	16	16
M&O	-	-	-	-	-	-
TOTAL	38	38	39	-	39	39

THE PROGRAMME

STRUCTURE

V. 6. 1. This programme consists of five sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

PHYSICS

OBJECTIVE

V. 6. 2. The objective is to foster the exchange of information relating to physics and to provide Member States with consultative and evaluating services in diverse branches of applied and fundamental research in physics, particularly fission, fusion, neutron and solid-state physics.

RESULTS TO DATE

V. 6. 3. This sub-programme was initiated in 1960. Symposia and conferences on inelastic scattering of neutrons, plasma physics and controlled nuclear fusion research, and the physics and chemistry of fission have been held. It is recognized that such meetings constitute the most important international media for the exchange of information and that they considerably influence developments in their respective subjects. Panels and consultants' meetings on selected topics have been organized to analyse and stimulate research of particular importance to developing countries.

PLANS FOR 1973-74

V. 6. 4. In addition to providing consultative and evaluating services and to supervising a number of research contracts, it is proposed to hold the Third International Symposium on Physics and Chemistry of Fission in 1973 (the first two were held in 1965 and 1969 respectively) and the Fifth International Conference on Plasma Physics and Controlled Nuclear Fusion in 1974 (the last three have been held at three-year intervals since 1965). It is planned to hold, during 1973-74, a panel on the application of neutron generators (with particular reference to the needs of the relatively large number of developing countries at present initiating a programme in this field), a panel on comparison of nuclear techniques in the study of hyperfine fields (as a follow-up to the meetings that have concentrated on the Mössbauer technique and which have given rise to considerable interest and activity in many developing countries), a panel on the application of lasers in the controlled fusion programme, a panel on nuclear physics and other applications of low-energy accelerators, and a panel on ternary fission, experiment and theory. Annual meetings of the International Fusion Research Council and of the Joint Liaison Group on Thermionic Electrical Power Generation, co-sponsored by OECD(NEA), are also planned.

RELATED ACTIVITIES

V. 6. 5. The related activities involve the award of research contracts in fission cross-section measurements, fission theory and computation, fission process experiments, nuclear data measurements, hyperfine field studies, and fundamental studies in radiation damage. They also involve the evaluation of some 30 requests for assistance in regard to physics, electronics or related subjects and the provision of advice on the technical supervision of 11 technical assistance projects.

PLANS FOR 1975-78

V. 6. 6. Special attention will be paid to projects organized on a regional basis or of international scope that may arise in areas such as controlled fusion, thermionic energy conversion in space or subterranean environments, and particle acceleration and measurements in the environment.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 6. 7. This sub-programme involves co-operation with UNESCO, the Inter-American Nuclear Energy Commission, IUPAP, the European Physical Society, and OECD(NEA) (in the co-ordination of meetings).

CHEMISTRY

OBJECTIVE

V. 6. 8. The objective is to promote the exchange of information relating to those aspects of nuclear energy which involve chemistry, to initiate and supervise relevant research contracts and advise Member States on the chemistry aspects of their nuclear programmes.

STRUCTURE

V. 6. 9. This sub-programme consists of four components which are described in the following paragraphs.

The thermodynamics of nuclear materials

Objective

V. 6. 10. The objective is to ensure that the relevant information on the behaviour of nuclear materials is made widely known and that recommended and accepted values for the appropriate thermodynamic constants are used when predicting fuel performance and failure under accident conditions.

Results to date

V. 6. 11. Under this component, which was initiated in 1961, 11 publications have been produced and a series of critical reviews of thermodynamic properties has been published in the Atomic Energy Review. Methods to collect data and evaluate basic thermodynamic constants have been devised.

Plans for 1973-74

V. 6. 12. Emphasis is now being placed on such topics as the chemical state of fission products in highly irradiated fuels and the extrapolation of the properties and behaviour of nuclear fuels under conditions, such as accident conditions, which do not readily permit direct experimental study. In 1973 a panel will be held on the chemical state of fission products in highly irradiated fuels and for 1974 a further symposium on the thermodynamics of nuclear fuels is planned, with the emphasis on the behaviour of fuels at very high temperatures.

Plans for 1975-78

V. 6. 13. Meetings on thermodynamics of nuclear materials will be organized every two to three years when progress in the collection and assessment of data warrants.

Co-operation with other organizations

V. 6. 14. This component involves the joint sponsorship of meetings with IUPAC.

The analytical chemistry of nuclear materials

Objective

V. 6. 15. The objective is to assist in the establishment of accurate and well-characterized analytical methods for the analysis of nuclear materials.

Results to date

V. 6. 16. This component was initiated in 1969. Two publications on analytical methods have been produced and the need for an international programme to prepare standard reference materials has been recognized.

Plans for 1973-74

V. 6. 17. A meeting will be arranged to recommend methods for the determination of radioactivity in sea-water at and below monitoring levels. Further meetings will be devoted to the subject of quality control and standards in response to requests from Member States. The issuance of standard samples for quality control purposes will be continued in close co-operation with the Agency's laboratory.

Plans for 1975-78

V. 6. 18. A further symposium is being considered for the period 1976-77 and the production of standard reference materials will be investigated in conjunction with Member States.

The production and utilization of radioisotopes

Objective

V. 6. 19. The objective is to encourage and stimulate the use of research reactors for the preparation of radioisotopes and products derived therefrom, in particular the production and quality control of radiopharmaceuticals derived from both accelerator and reactor produced isotopes.

Results to date

V. 6. 20. The two major reports on the production of radioisotopes which have been published within the framework of this component, which was initiated in 1961, are regarded as authoritative works of reference. Reports from field experts indicate that this activity has resulted in a steady improvement in the quality of radioisotopes produced by developing Member States.

Plans for 1973-74

V. 6. 21. A symposium on new trends in labelled compounds with emphasis on radiopharmaceuticals and panel meetings and consultants' meetings to advise on the production and utilization of accelerator-produced isotopes will be held in 1973. Monographs on radiopharmaceuticals for the international pharmacopoeia are planned in conjunction with WHO. A manual on the preparation and control of radiopharmaceuticals will be issued in 1974.

Related activities

V. 6. 22. Several research contracts and agreements will be awarded in 1973-74 under a co-ordinated research programme on the preparation and quality control of radiopharmaceuticals. A large number of requests for technical assistance is expected and training courses on the preparation and control of radiopharmaceuticals will be organized in 1973-74.

Plans for 1975-78

V. 6. 23. The co-ordinated research programme will be expanded to include rapid tests for sterility and apyrogenicity and meetings will be held to consider new developments as appropriate.

Co-operation with other organizations

V. 6. 24. This component involves co-operation with WHO in regard to radiopharmaceuticals.

Reactor chemistry

Objective

V. 6. 25. The objective is to promote the efficient use of reactors in chemistry.

Results to date

V. 6. 26. This component was initiated in 1958. The use of research reactors has been stimulated by publications on the chemical effects of nuclear transformations, hot-atom chemistry, radiation chemistry and activation analysis.

Plans for 1973-74

V. 6. 27. A panel meeting on corrosion and mass transport phenomena in nuclear reactors will be held in 1974. An interregional training course on neutron activation analysis is also planned for this period.

Related activities

V. 6. 28. A large number of requests for technical assistance is expected in 1973-74.

Plans for 1975-78

V. 6. 29. A symposium on fuel reprocessing is scheduled for this period. This is particularly important for the development of fast reactor concepts which require quick turn-round fuel processing.

INDUSTRIAL APPLICATIONS

OBJECTIVE

V. 6. 30. The objective of this sub-programme, which was initiated in 1966, is to advise and assist Member States in the industrial uses of radioisotopes and radiation technology with particular emphasis on applications from which considerable economic benefit can be derived, especially by developing countries.

STRUCTURE

V. 6. 31. This sub-programme consists of two components which are described in the following paragraphs.

Radiation processing

Objective

V. 6. 32. The objective is to assist Member States in utilizing high-energy ionizing radiation for initiating chemical syntheses and polymerization reactions and for sterilizing medical supplies which are not suitable for heat or chemical sterilization.

Results to date

V. 6. 33. This component was initiated in 1966. Radiation processing and sterilization techniques are progressively gaining wider recognition in the chemical and other manufacturing industries. The Agency programme has paved the way towards industrial utilization of such techniques in four developing Member States on a pilot plant scale.

Plans for 1973-74

V. 6. 34. Particular emphasis will be given to the study of engineering and economic aspects of selected radiation-induced processes. Demonstration projects will be formulated, and it is planned to hold meetings on the design of irradiators for industrial processing in 1973 and on the engineering aspects of the economic evaluation of radiation processing in 1974.

Related activities

V. 6. 35. The related activities involve the award of four research contracts on various aspects of radiation processing technology and the provision of assistance for UNDP projects consisting of a demonstration plant for irradiation sterilization of medical products in India (field operations, including plant construction and commissioning, will commence in early 1972 and are planned to continue for three years), a radiation processing and demonstration facility in Korea, and a demonstration plant for irradiation sterilization of medical products in Hungary.

Plans for 1975-78

V. 6. 36. Attention will be shifted to applications in other industrial sectors.

Co-operation with other organizations

V. 6. 37. This component involves co-operation with UNIDO in regard to the organization of a long-range plan and demonstration projects and the possible transfer of routine applications.

Mineral resources

Objective

V. 6. 38. The objective is to advise developing Member States on the proper selection and use of nuclear methods and instrumentation for their mineral resources programmes.

Results to date

V. 6. 39. This component was initiated in 1968. It has been shown that nuclear techniques often result in greater efficiency and savings in the prospection, development and exploitation of mineral resources.

Plans for 1973-74

V.6.40. The Agency will provide support to developing Member States both in their research and development activities and in their attempt to apply nuclear techniques as supplementary tools in various areas of the mineral industries. The present interest of developing countries appears to be largely in mineral prospecting but this will gradually be shifted to the successive stages of development and exploitation of mineral deposits. Recent progress in these application areas will be reviewed and assessed, and a panel on nuclear techniques in mineral processing will be convened in 1974.

Related activities

V.6.41. The related activities involve the award of research contracts. Four countries are participating in a co-ordinated programme on the use of nuclear techniques in geochemical and geobotanical mineral prospecting and the results will be reviewed in 1972.

Plans for 1975-78

V.6.42. The development trend in the mineral processing industry appears to be towards processing plants of larger throughput which may have to process lower grade ores. It is therefore predicted that the interest in the use of on-stream radioisotope sensors with an on-line computer for central plant control will increase. By this time, californium-252 may also become more widely available for industrial uses related to mineral exploitation and process control. The Agency will expand its mineral resources programme to cover these developments.

Co-operation with other organizations

V.6.43. This component involves co-operation with UNIDO and ECOSOC's Committee on Natural Resources.

ISOTOPE HYDROLOGY

OBJECTIVE

V.6.44. The objective is to encourage the use of isotope techniques as an additional tool for hydrological investigations and to promote the refinement of existing methods and development of new techniques.

RESULTS TO DATE

V.6.45. This sub-programme was initiated in 1961. The participation of the Agency in IHD has provided a useful means of information exchange which has resulted in increased requests for assistance. The Guidebook on Nuclear Techniques in Hydrology is the only publication exclusively devoted to the subject and has stimulated work on such techniques.

V.6.46. The Agency, in collaboration with WMO, initiated in 1961 the global survey of the isotopic composition of precipitation, and the resulting data are being published by the Agency and provide the basis for the use of environmental isotope techniques. Their use in UNDP(SF) projects not only contributes to the solution of specific hydrological problems but also to a further refinement of techniques. During 1971-72 seven such projects in Algeria, Chad, Crete, Morocco, Nicaragua, Northern Sahara and Senegal were completed.

PLANS FOR 1973-74

V.6.47. Emphasis will be placed on the provision of information on, and training in, the use of isotope techniques in hydrology, the development of new methods and the promotion

of field applications. A symposium concerned with the research aspects of isotope hydrology is proposed for 1974. The Agency will provide the technical secretariat of the IHD Working Group on Nuclear Techniques when it meets in 1973 and 1974. IHD will end in 1974. UNESCO has drawn attention to the need for regional study groups and training seminars on isotope hydrology, and the Agency is considering the possibility of inter-agency collaboration and the holding of such a seminar in 1974 in India. The promotion of field applications of isotope techniques in hydrology will be carried out through research contracts, technical assistance projects and sub-contractual arrangements with other United Nations organizations responsible for the execution of UNDP projects Normally the sub-contractual work involves only he use of environmental isotope techniques. The global survey of the isotopic composition of precipitation will be maintained, but on a reduced scale.

V. 6. 48 Requests for advice on the feasibility of using isotope techniques to solve particular hydrological problems wi l increase Work requiring relatively little analytical effort will continue to be carried out in which the Agency's laboratory facilities will be used to provide a demonstration of the techniques.

V 6. 49. The Agency will continue o play a catalytic role in initiating bilateral arrangements between existing national isotope hydrological groups and institutes in the developing countries which have limited facilities

RELATED ACTIVITIES

V. 6. 50. The related activities involve research contracts and agreements, in which 15 countries are participating, and he processing of some 15 requests for assistance. A training course is to be held in Africa and a seminar in India in 1974. The Laboratory provides analytical services, particularly in connection with UNDP projects, which are likely to increase, and some development work to improve analytical methods and intercomparisons of environmental isotope measurements will continue to be done.

PLANS FOR 1975-78

V. 6. 51. Work involving the exchange of information will continue and will include a symposium on applications of isotope techniques in hydrology to be held in a developing country in 1975. Periodic panel meetings on specialized topics, such as applications of techniques to solve water pollution problems, are planned.

V. 6. 52. Although IHD will end in 1974, discussions at an international level are now in progress on the possibility of a long-term international programme in hydrology in which the Agency may participate by carrying out work relating to isotope hydrology.

V. 6. 53. Requests for advice on planning the collection and interpretation of isotope data in field studies are expected to increase as more developing countries establish the r own programmes. This, in turn, is likely to result in an increase in the intercomparison activities of the Laboratory.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 6. 54. This sub-programme involves co-operation with WMO in regard to a survey of isotopes in precipitation, UNESCO in regard to IHD and in providing a training course, and the United Nations, FAO, UNESCO and WHO in providing sub-contractual services in UNDP projects.

NUCLEAR DATA

OBJECTIVE

V 6.55. The objective is to promote the world-wide exchange and evaluation of nuclear data, to assess nuclear data needs and to further national nuclear data programmes for peaceful nuclear energy purposes.

RESULTS TO DATE

V.6.56. The main results obtained since the sub-programme was initiated in 1963 comprise the publication of CINDA and other handbooks, the establishment of the computer-based EXFOR system for exchange of experimental neutron data, the promotion of free exchange of evaluated neutron data, including a world-wide survey, reviews of important standards for neutron data measurements and for reactor design, the review of nuclear data requests (RENDA project) and of requirements for accelerator targets and samples for nuclear data measurements in developing countries, and the taking of the first steps towards co-ordination of compilation and exchange of important non-neutron nuclear data.

PLANS FOR 1973-78

V.6.57. The work will continue to be carried out in accordance with the recommendations of the International Nuclear Data Committee (INDC) which meets annually, with the Agency providing the scientific secretariat Nuclear data conferences will be held at four-year intervals. National institutions in about 45 Member States are expected to request and supply nuclear data.

CO-OPERATION WITH OTHER ORGANIZATIONS

V 6.58. The programme is formulated jointly with INDC and involves close co-operation with the following regional neutron data centres: USAEC Division of Technical Information Extension, United States National Neutron Cross-Section Center, OECD(NEA) Neutron Data Compilation Centre (NDCC), and USSR Nuclear Data Centre (Centr po Jadernym Dannym), as well as with the European-American Nuclear Data Committee (EANDC), the EURATOM Central Bureau for Nuclear Measurements (Bureau Central de Mesures Nucléaires) (BCMN), and the ICSU Committee on Data for Science and Technology (CODATA).

STRUCTURE

V.6.59. This sub-programme consists of five components which are described in the following paragraphs.

Experimental neutron data

Objective

V.6.60. The objective is to compile and disseminate experimental neutron data to promote the world-wide exchange of such data, and to co-ordinate the activities of regional data centres.

Results to date

V.6.61. This component was initiated in 1966. CINDA, the reference handbook for neutron data, has been developed as an international undertaking and is now published annually by the Agency.

V.6.62. The computer-based system EXFOR for the world-wide exchange of experimental neutron data has been in operation since July 1970. In the last year 300 data

sets with 50 000 data lines were supplied upon request to 16 countries outside OECD. Computer programmes for storage, checking, retrieval and editing have been developed and provided upon request to other data centres.

Plans for 1973-74

V. 6. 63. The work will be continued with emphasis on neutron data needed for reactors and for shielding, safeguards, and fusion. This development is co-ordinated by annual meetings of consultants from the centres involved.

Plans for 1975-78

V. 6. 64. The compilation workload will increase. In addition, as a result of the foreseeable growth in data scope, it will be necessary to intensify the co-operation with other specialized data centres with due regard to the requirements concerning non-neutron nuclear data.

Evaluated neutron data

Objective

V. 6. 65. The objective is to make evaluated neutron data available to developing countries and to establish a world-wide exchange of such data.

Results to date

V. 6. 66. This component was initiated in 1963. Free exchange of evaluated neutron data has been achieved for the Karlsruhe Evaluated Neutron Data Library and of selected data from Australia, Hungary, Italy and the United Kingdom. During the past year, 800 data sets with 700 000 data lines were supplied upon request to 13 countries outside OECD. A world-wide survey of the status and needs of evaluated neutron data was carried out in 1971.

Plans for 1973-74

V. 6. 67. The development of the Evaluated Neutron Data Library of the Soviet Union and the unrestricted exchange of evaluated data will be promoted; the exchange of data and the provision of related services to developing countries is expected to increase.

Plans for 1975-78

V. 6. 68. The data scope will be extended from reactor physics to shielding, safeguards and fusion.

Data review

Objective

V. 6. 69. The objective is to review and evaluate standard neutron data and other nuclear data of primary importance for the development of nuclear technology.

Results to date

V. 6. 70. This component was initiated in 1964. Reviews of nuclear standards for neutron data measurements and of important standard and reactor data have provided the basis for further research and have helped to clarify discrepancies in experimental data; "best" values for use in reactor design have been recommended. Computer programmes for data evaluation have been developed or adapted.

Plans for 1973-74

V. 6. 71. The recurrent updating of former reviews is planned. Reviews of uranium-235 fission, threshold reactions for reactor radiation measurements, and of other subjects will be carried out as need arises. A third conference on nuclear data to cover a wider scope of nuclear applications is scheduled for 1974.

Plans for 1975-78

V. 6. 72. The work may be expanded as the need arises to include the evaluation of additional data for shielding, safeguards and fusion.

Requests for measurements and samples

Objective

V. 6. 73. The objective is to assess nuclear data needs for various applications and to promote measurements of requested nuclear data.

Results to date

V. 6. 74. This component was initiated in 1970 and comprises the compilation of RENDA in the fields of reactors and safeguards, and a first survey of requirements for accelerator targets and samples for nuclear data measurements in developing countries.

Plans for 1973-74

V. 6. 75. The main activities will consist of a recurrent review and publication of RENDA and development of relevant computer programmes, the consolidation of the nuclear data request lists for safeguards and fusion, and the provision of assistance to developing countries in the purchase of targets and samples.

Plans for 1975-78

V. 6. 76. The work will be continued with particular reference to the measurements of requested nuclear data.

Co-operation with other organizations

V. 6. 77. This component involves co-operation with INDC and EANDC in regard to the review of RENDA requirements and research co-ordination; with OECD(NEA)/NDCC Saclay for the joint preparation of the RENDA handbook, and with EURATOM/BCMN Geel, Belgium, in connection with the supply of materials and fabrication of targets and samples for nuclear data measurement.

Non-neutron data

Objective

V. 6. 78. The objective is to promote and co-ordinate the compilation, evaluation, exchange and dissemination of non-neutron data of importance to nuclear energy applications.

Results to date

V. 6. 79. This component, which was initiated in 1970, has resulted in the establishment of an International Working Group for the Compilation, Evaluation and Dissemination of Nuclear Structure and Reaction Data.

Plans for 1973-74

V. 6. 80. Subject to recommendations of the International Working Group for the Compilation, Evaluation and Dissemination of Nuclear Structure and Reaction Data, emphasis will be placed on co-ordination of compilation and exchange of data important for reactors, fusion, safeguards, and other nuclear applications. Co-operation between neutron and non-neutron nuclear data centres will be furthered by convening consultants' meetings, panels and working groups. A symposium on applied nuclear data is planned for 1973.

Plans for 1975-78

V. 6. 81. An amplification of the programme, with increasing emphasis on technical co-operation between neutron and non-nuclear data centres in the development of computer-based nuclear data information systems, is envisaged in 1975-78.

Co-operation with other organizations

V. 6. 82. This involves co-operation with EURATOM/BCMN Geel, Belgium in regard to programme co-ordination, and with ICSU/CODATA, IUPAP and the European Physical Society as far as dissemination of information is concerned.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 6. 83. One GS post has been transferred to this programme from the Life Sciences programme in the revised manning table for 1972. No changes in the manning tables for 1973 and 1974 are envisaged.

COSTS

V. 6. 84. For 1973 it is expected that the cost of this programme will increase by $61 000. The estimated salary and other price increases, amounting to $73 400, are partly offset by a net programme reduction of $12 400. Of the price increases, $52 000 will be required to meet the cost of higher salaries and related common staff costs $1300 for consultants' services, $3000 for travel, $10 100 for scientific meetings and related hospitality, $6000 for scientific and technical contracts, and $1000 for common services, supplies and equipment in connection with the CINDA publication.

V. 6. 85. The programme reduction of $15 600 in respect of salaries for established posts and related common staff costs is based on the assumption that, as in other programmes, it will be possible in 1973 to achieve certain savings by delays in recruitment.

V. 6. 86. The programme increase of $3000 for consultants' services is largely offset by the elimination of the provision for temporary assistance in the amount of $2000. Slight programme increases in respect of seminars symposia and conferences and related hospitality, scientific and technical contracts and the CINDA publication are almost offset by the programme reductions in respect of travel and panels and committees and the elimination of the sum of $15 000 which was included in the budget estimate for 1972 to provide nuclear targets for the nuclear data work, when it was assumed that it would not be necessary to provide for this activity in 1973. The income from the sale of the CINDA publication is expected to be at least $10 000, the same amount as was foreseen in the 1972 budget.

V. 6. 87. For 1974 an increase of $68 000 in the cost of the programme is expected, which will be attributable to salary and other price increases, except for a programme increase of $17 000 for nuclear targets, for which no provision has been made in the 1973 estimate.

7. THE LABORATORY

Summary of costs

Table V. 7. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	659 278	765 000	91 000	-	91 000	856 000	905 000
Consultants	-	-	-	-	-	-	-
Overtime	2 454	5 500	500	-	500	6 000	7 000
Temporary assistance	3 205	500	100	-	100	600	700
Sub-total	664 937	771 000	91 600	-	91 600	862 600	912 700
Common staff costs	240 724	264 000	16 100	-	16 100	280 100	298 700
Travel	2 299	3 000	200	-	200	3 200	3 500
Meetings							
Panels and committees	-	-	-	-	-	-	-
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	-	-	-	-	-	-	-
Scientific and technical contracts	558	-	-	1 100	1 100	1 100	1 100
Scientific supplies and equipment	139 772	157 000	12 000	4 000	16 000	173 000	190 000
Common services, supplies and equipment	122 269	110 000	21 500	16 500	38 000	148 000	162 000
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	1 170 559[a/]	1 305 000	141 400 10.8%	21 600 1.7%	163 000 12.5%	1 468 000	1 568 000

a/ Includes $152 307 from Operating Fund I.

Summary of manpower

Table V. 7. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	-	-	-	-	-	-
P-5	5	5	5	-	5	5
P-4	11	11	11	-	11	11
P-3	7	7	7	-	7	7
P-2	6	6	6	-	6	6
P-1	1	1	1	-	1	1
Sub-total	30	30	30	-	30	30
GS	53	53	53	-	53	53
M&O	21	21	21	-	21	21
TOTAL	104	104	104	-	104	104

THE PROGRAMME

STRUCTURE

V.7.1 This programme consists of five sub-programmes which are dealt with separately below.

SUB - PROGRAMMES

METROLOGY

OBJECTIVE

V.7.2. The objective is to provide services to Member States and to other units of the Agency in the accurate assay of radionuclides, nuclear spectroscopy and the preparation of calibrated radioactive sources.

STRUCTURE

V.7.3. This sub-programme consists of four components which are described in the following paragraphs.

Distribution of standardized radioactive sources

Objective

V.7.4. The objective is to assist Member States in the calibration of instruments against absolute standardized samples.

Results to date

V.7.5. This component was initiated in 1962. Many thousands of sources of radionuclides have been distributed to institutes in Member States for the purpose of calibration of instruments against absolute standardized samples. This service was discontinued when commercial concerns began supplying similar services.

Comparison and preservation of radionuclide calibration standards

Objective

V.7.6. The objective is to enable standardizing laboratories to compare their results with those of other laboratories over a period of years.

Results to date

V.7.7. This component was initiated in 1970. The stability of the response of the 4-pi ion chamber has been found satisfactory. A duplicate installation has been set up as an essential reserve. In the course of testing the apparatus, a number of half-lives of radionuclides have been measured with a very high precision.

Plans for 1973-74

V.7.8. Samples will be received from a number of institutes engaged in absolute calibration of radionuclides and compared; results will be recorded and circulated. A panel, to be held in 1973, will advise on the future development of this work.

Plans for 1975-78

V.7.9. The continuation of the work will depend on the recommendations of the panel.

Distribution of materials for reactor neutron fluence measurements

Objective

V.7.10. The objective is to enable reactor centres, especially those in developing countries, to determine the "in-pile" neutron fluence and its energy distribution by providing suitable "kits" and manuals.

Results to date

V.7.11. This component was initiated in 1966. Five different kinds of sets of detectors for the evaluation of fast-neutron fluence measurements and one for slow-neutron fluence have been tested and are available for use in reactor centres.

Plans for 1973-74

V.7.12. The distribution of the calibration sets will continue as long as the demand exists. In addition, material and standards for fission ratio measurements involving the use of solid-state track recorders will be made available to reactor centres as the determinations of the fission ratios uranium-238/uranium-235 and plutonium-239/uranium-238 are part of many investigations of reactor parameters.

Plans for 1975-78

V.7.13. The future work will depend upon the demand for this service.

Provision of assistance to the Department of Safeguards and Inspection

Objective

V.7.14. The objective is to establish analytical reference samples for use as analytical quality control samples.

Results to date

V.7.15. This component was initiated in 1965. Calibrated sources of alpha and gamma emitters have been prepared for checking instruments. The tritium content of heavy-water samples from reactors has been measured as a possible means of measuring the integrated power of heavy-water reactors.

Plans for 1973-74

V.7.16. Support for the Agency's safeguards programme is expected to increase. The demand for calibration sources will probably increase. Initial control and calibration of instruments will be carried out together with investigation of possible new assay methods. Alpha spectrometric methods for the determination of isotopic ratios of transuranic elements will be checked.

Plans for 1975-78

V.7.17. The work is expected to increase as safeguards activities develop.

CHEMISTRY

OBJECTIVE

V.7.18. The objective is to advise and assist Member States, other units of the Agency and other United Nations organizations in chemistry, particularly analytical chemistry.

STRUCTURE

V.7.19. This sub-programme consists of four components which are described in the following paragraphs.

Provision of assistance to the Department of Safeguards and Inspection

Objective

V.7.20. The objective is to provide chemical laboratory support, particularly analytical, to the Department of Safeguards and Inspection.

Results to date

V.7.21. This component was initiated in 1965. Methods have been developed and applied for the determination of uranium and plutonium in safeguards samples. Over 200 samples have been analysed. The Laboratory has participated in an international intercomparison of analysis for uranium and plutonium. For lack of a mass-spectrometer for uranium and plutonium, radiometric methods have been used for the determination of uranium-235. Investigations on the determination of this isotope by atomic absorption have started. Health physics measurements (e.g. plutonium in urine) are carried out as a matter of routine for inspectors and staff working with plutonium.

Plans for 1973-74

V.7.22. Analytical and other support will continue on an increasing scale as the number of samples is expected to increase. As experience is gained, new analytical methods will be developed. After the procurement of a mass-spectrometer, determinations of mass spectra for isotopic dilution and isotopic distribution purposes will be made. Intercomparison work with laboratories in the chain of safeguards national laboratories will be done. Reference and analysed samples will be prepared, distributed and compared. Work on the atomic absorption method for uranium-235 will continue if development of small equipment appears possible. Training of safeguards inspectors in analytical methods will take place.

Plans for 1975-78

V.7.23. Reference laboratory activities will continue.

Provision of assistance to the Agricultural Section of the Laboratory in chemical matters

Objective

V.7.24. The objective is to provide support in chemistry to the Agricultural Section.

Results to date

V.7.25. This component was initiated in 1962. Mass- and emission-spectrometric methods for the determination of nitrogen-15 have been developed. An automatic apparatus for the determination of total nitrogen plant material has been designed and built. Samples of plant and other proteins have been prepared and the resultant amino-acid mixtures have been analysed.

Plans for 1973-74

V.7.26. The provision of the assistance in question will continue as required. It is expected, however, that the increasing interest in nitrogen-15 and the protein programme will result in the preparation of several thousand samples for nitrogen-15 and 20 000-30 000 for protein by the dye-binding method per year.

Plans for 1975-78

V.7.27. Continuation of the service will depend upon the demand.

Provision of assistance in analytical chemistry to other Sections of the Agency, other United Nations organizations and Member States

Objective

V.7.28. The objective is to provide support in chemistry to other Sections of the Agency, other United Nations organizations and Member States.

Results to date

V.7.29. This component was initiated in 1962. Mineralogical samples submitted by technical assistance prospecting experts and Member States have been analysed for uranium and thorium and other elements of economic interest. In 1970, 50 samples were received from five different countries and were analysed only for thorium and uranium. In 1971, however, 86 samples were received and a total of 376 analyses were carried out for uranium, thorium and elements of economic interest (copper, zinc, lead, silver, molybdenum and cobalt). In co-operation with WHO, analytical methods for the quality control of radiopharmaceuticals (sodium chromate labelled with chromium-51, technetium-99m and indium-113m from generators) have been compared.

Plans for 1973-74

V.7.30. The number of mineralogical samples is expected to increase. Support for co-ordinated research contract programmes will continue. As the specifications for radiopharmaceuticals are established, support for this work will be phased out.

Plans for 1975-78

V.7.31. Services will be provided as required.

The establishment and provision of analytical quality control samples of nuclear interest to institutes in Member States

Objective

V.7.32. The objective is to establish analytical reference samples for use as analytical quality control samples.

Results to date

V.7.33. This component was initiated in 1964. The establishment of an "analysed sample" involves an intercomparison with many laboratories which produces valuable statistics about the accuracy and precision of the methods used and can act as a check for participating laboratories. About 30 different types of material are now available as "analysed samples" for use in checking analytical methods.

Plans for 1973-74

V.7.34. The analytical quality control will continue and further analytical intercomparisons will be organized for laboratories in Member States. It is expected that the range of materials to be covered in 1973-74 will include some materials serving as samples in the control of environmental pollution and industrial hygiene, in particular metallic contaminants which can be determined very sensitively by nuclear methods. In 1974 a panel of experts will advise on the work for the following years.

Plans for 1974-78

V.7.35. With the increasing interest in pollution problems it is expected that more materials will be requested to assess analytical performance by nuclear methods. With the rapidly increasing number of power reactors and the resulting waste disposal operations, it is also expected that there will be renewed interest in low-level radionuclide determination to check on environmental radionuclide levels around nuclear installations and waste disposal sites.

Co-operation with other organizations

V.7.36. A total of 120 laboratories in 40 countries collaborate in the certification of the reference samples. This component also involves co-operation with ILO, FAO, WHO, WMO and IUPAC in matters of direct concern to these organizations.

AGRICULTURE

OBJECTIVE

V.7.37. The objective is to assist the Joint FAO/IAEA Division by the provision of analytical and other services, particularly in support of co-ordinated research contract programmes.

RESULTS TO DATE

V.7.38. This sub-programme was initiated in 1962. With regard to soil fertility, analytical and developmental services have been provided for studies of the efficient use of fertilizers for rice, maize, wheat, tree crops and legumes. Methods for the determination of phosphorus-32, nitrogen-15 and total nitrogen have been developed and put into routine use.

V.7.39. With regard to entomology, methods for the mass rearing of the Mediterranean fruit fly, olive fly, tsetse fly and the cocoa moth have been or are being developed. Attempts to rear tsetse flies without the direct use of animals have been successful.

V.7.40. With regard to plant breeding, methods of increasing mutation rates and, at the same time, minimizing physiological damage by gamma and neutron bombardment of seeds have been investigated. By irradiation in nitrogen the neutron dose rate could be drastically reduced while still maintaining the same mutation frequency as in air. It was also established that activation of the seeds by soaking in water prior to the irradiation treatment greatly increased the mutagenic effect. An irradiation service for seed samples from Member States has been established.

V.7.41. In-service training has been provided for all activities relating to agriculture; 52 fellows have so far been trained.

PLANS FOR 1973-78

V.7.42. Work in soil fertility, entomology and plant breeding will continue, as shown in the programme of the Joint FAO/IAEA Division.

TRAINING

OBJECTIVE

V.7.43. The objective is to supply in-service training for fellows in subjects for which the Laboratory has the necessary equipment and expertise.

RESULTS TO DATE

V.7.44. This sub-programme was initiated in 1962. Since 1962, 78 trainees have worked at the Laboratory for periods of one month or more on chemistry, physics, entomology, plant breeding and soil-plant relationships. In the past three years 32 trainees have been trained, 12 in 1969, 10 in 1970 and 10 in 1971.

PLANS FOR 1973-78

V.7.45. In-service training will continue to be provided in appropriate subjects. About 10-12 trainees per year are expected.

ELECTRONICS AND WORKSHOP SERVICES

OBJECTIVE

V.7.46. The objective is to provide electronics and workshop services to assist all Sections of the Agency as required.

RESULTS TO DATE

V.7.47. This sub-programme was initiated in 1960. Maintenance has been provided for the electronic equipment and some has been designed and built when not commercially available. The latter equipment includes interfaces between multichannel analysers and the Agency computer, automation equipment for counting and other systems and special low-noise, high-count-rate amplifiers. In the past two years services in both maintenance and building of equipment which have been provided to the Department of Safeguards and Inspection have increased; these services at present account for about 50% of the work.

PLANS FOR 1973-74

V.7.48. It is foreseen that in addition to the normal activities, services for safeguards work will increase. These services will involve maintenance of portable equipment and the design and construction of pieces of required equipment and of interphases for multichannel analysers with computers.

PLANS FOR 1975-78

V.7.49. Services will continue to be made available, particularly for safeguards work.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.7.50. No changes in the manning tables are expected for 1973 and 1974.

COSTS

V.7.51. For 1973 it is foreseen that the cost of the Laboratory programme will increase by $163 000, of which $141 400 is attributable to higher salaries and other price increases, and $21 600 to a programme increase over the 1972 revised budget.

V.7.52. Salaries and related common staff costs for established posts are expected to increase by $107 100, overtime and temporary assistance by $600 and travel costs by $200. The costs in respect of scientific and technical contracts, scientific supplies and equipment and common services supplies and equipment will increase by a total of $55 100, of which $33 500 represent price increases over the 1972 budget estimate. However, on the basis of actual expenditure in 1971 for common services, supplies and equipment, the total increase in the cost of this item is absorbed by price increases.

V.7.53. Income from reimbursable laboratory services is expected to be $47 000 for 1973. Compared with the estimate for 1972 of $45 000 which also included unobligated balances from Operating Fund I following transfer of the remaining balance of Laboratory programme costs from the Operational to the Regular Budget [V.7.1], the 1973 income from reimbursable services is expected to be higher than the income for 1972 partly because it is planned to increase the charges for such services to offset price increases.

V.7.54. For 1974 an increase of $100 000 in the cost of the Laboratory programme is foreseen which will be mainly attributable to higher prices and salaries, since only about $10 000 will represent a programme increase. Income from reimbursable laboratory services is again estimated at $47 000.

[V.7.1] GC(XV)/460, para. I.9.

8. INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Summary of costs

Table V.8.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	133 463	147 000	14 000	-	14 000	161 000	171 000
Consultants	17 155	10 900	1 100	-	1 100	12 000	14 000
Overtime	5 124	3 500	-	-	-	3 500	3 500
Temporary assistance	18 630	13 300	1 700	-	1 700	15 000	20 600
Sub-total	174 372	174 700	16 800	-	16 800	191 500	209 100
Common staff costs	33 731	51 000	2 000	-	2 000	53 000	56 400
Travel	4 231	5 000	500	(500)	-	5 000	5 000
Meetings							
Panels and committees	-	5 000	500	-	500	5 500	5 500
Seminars, symposia and conferences	89 613	69 000	7 000	(6 000)	1 000	70 000	70 000
Representation and hospitality	3 284	2 500	500	-	500	3 000	3 000
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	123 229	128 000	13 000	-	13 000	141 000	151 000
Other items of expenditure							
Fellowships	36 914	39 000	1 000	(3 000)	(2 000)	37 000	37 000
Visiting scientists and lecturers	124 506	113 300	5 000	(5 300)	(300)	113 000	129 000
Associate members	72 503	75 000	4 000	(4 000)	-	75 000	80 000
Federated institutions	8 724	12 500	700	(1 200)	(500)	12 000	14 000
Sub-total	242 647	239 800	10 700	(13 500)	(2 800)	237 000	260 000
TOTAL	671 107	675 000	51 000 7.5%	(20 000) (2 9%)	31 000 4.6%	706 000	760 000
Source of funds:							
Regular Budget	155 000	150 000	5 000	-	5 000	155 000	181 000
Operating Fund I	516 107	525 000	46 000 8.7%	(20 000) (3.8%)	26 000 4.9%	551 000	579 000
TOTAL	671 107	675 000	51 000 7.5%	(20 000) (2.9%)	31 000 4.6%	706 000	760 000

Summary of manpower

Table V.8.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	-	-	-	-	-	-
P-5	1	1	1	-	1	1
P-4	1	1	1	-	1	1
P-3	1	1	1	-	1	1
P-2	1	1	1	-	1	1
P-1	-	-	-	-	-	-
Sub-total	4	4	4	-	4	4
GS	15	15	15	-	15	15
M&O	2	2	-	-	-	-
TOTAL	21	21	19	-	19	19

THE PROGRAMME

OBJECTIVE

V.8.1. The objective is to foster, through research and training, the advancement of theoretical physics with special regard to the needs of developing countries so as to encourage theoretical physicists from those countries to continue and expand their research work.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.8.2. The Trieste Centre is operated jointly with UNESCO and supported by the Italian Government. The Ford Foundation and SIDA also participate in its financing.

STRUCTURE

V.8.3. This programme consists of four sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

CONDENSED MATTER PHYSICS

OBJECTIVE

V. 8. 4. The objective is to foster training and research in condensed matter physics in developing countries in view of its relevance in meeting scientific, industrial and technological needs.

RESULTS TO DATE

V. 8. 5. This sub-programme was initiated in 1967. Extended courses were held in 1967, 1970 (followed by a workshop) and 1972. To date, around 300 scientists have participated in these activities, and approximately 70 preprints as well as the proceedings of the extended courses have been published.

PLANS FOR 1973-74

V. 8. 6. It is planned to organize a workshop in 1973 and an extended course (Winter College) in 1974, followed by a workshop. Two "topical meetings" - research sessions - are also to be held within the framework of these activities in 1973.

PLANS FOR 1975-78

V. 8. 7. A permanent group consisting of scientists conducting research and supervising research conducted by younger fellows will be established, and Winter Colleges will be organized every second year followed by workshops.

HIGH-ENERGY AND PARTICLE PHYSICS

OBJECTIVE

V. 8. 8. The objective is to constitute a forum for international collaboration in the most advanced fields of research in fundamental theoretical physics at the highest possible level, and to enable university teachers from developing countries to come to the Centre and bring their knowledge up to date and exchange ideas for their research work.

RESULTS TO DATE

V. 8. 9. This sub-programme was initiated in 1964. One extended seminar was held in 1965 and part of the Symposium on Contemporary Physics also covered high-energy and particle physics. Two topical meetings were held in 1969, two in 1970 and two in 1971. Research in high-energy physics has been carried out at the Centre since its inception. About 1000 physicists have participated in this part of the programme as visiting or guest scientists, associate members, fellows, guest lecturers, and seminar participants. Approximately 500 preprints have been published as well as the proceedings of the seminar held in 1965.

PLANS FOR 1973-74

V. 8. 10. Research will be carried out; three topical meetings will be held in 1973 and two in 1974. In addition to lectures to be delivered by specially invited speakers within the

framework of the weekly seminar programmes during the periods October 1973 - March 1974 and October - December 1974, leading physicists will be invited to give lectures during two-week periods.

PLANS FOR 1975-78

V. 8. 11. The existing permanent group dealing with high-energy and particle physics may be enlarged. Topical seminars will be organized as needed.

ATOMIC PHYSICS

OBJECTIVE

V. 8. 12. The objective is to provide an international scientific forum for exchanging ideas on some recent and promising developments in quantum optics and laser physics.

PLANS FOR 1973-74

V. 8. 13. This sub-programme is to be initiated in 1973. An extended course will be held during the period January - March 1973, followed by a workshop.

PLANS FOR 1975-78

V. 8. 14. Seminars and workshops will be organized.

PLASMA PHYSICS

OBJECTIVE

V. 8. 15. The objective is to provide a forum for high-level international collaboration in view of the scientific interest of the subject itself and its scientific interest in relation to astrophysics. Studies in plasma physics conducted at the Centre are designed to contribute to fundamental research aiming at the generation of power by fusion.

RESULTS TO DATE

V. 8. 16. This sub-programme was initiated in 1964; an extended course was held in that year. A small working party worked at the Centre throughout the period 1964-65, and its membership was increased in 1965-66. A research session was organized in 1970. Approximately 175 scientists participated in the research programme. About 50 preprints have been published as well as the proceedings of the extended course held in 1964.

PLANS FOR 1973-74

V. 8. 17. A research session will be held in 1974 with two topical meetings.

PLANS FOR 1975-78

V. 8. 18. The programme of work will be continued in the form of workshops and seminars and, if the development after 1974 which is foreseen takes place and the subject becomes of substantial interest for developing countries, a permanent group may be formed.

NON-AGENCY ACTIVITIES

V. 8. 19. In addition, the Trieste Centre will be carrying out two activities which do not form part of the Agency's programme. The first, relating to mathematics and computer science, was initiated in 1971 and is financed by UNESCO and UNDP. The second, relating to the mathematics and physics of oceans and the atmosphere, is to be initiated in 1973 and is expected to be financed by UNDP with the assistance of UNESCO and WMO.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 8. 20. Two M&O posts which have not been used at the Trieste Centre have been transferred to the common services programme in the revised manning table for 1972. No further changes in the manning table are foreseen for 1973 and 1974.

COSTS

V. 8. 21. For 1973 the total cost of this programme is expected to increase by $31 000 as a net result of salary and other price increases of $51 000, partly offset by programme reduction of $20 000.

V. 8. 22. Salaries and related common staff costs for established posts are expected to increase by $16 000, and the cost of consultants' services and temporary assistance by $2800. No net increase is foreseen in the estimate for travel; an amount of $1000 is foreseen to cover price increases in respect of the meeting of the Scientific Council and hospitality, and $13 000 to cover the higher cost of common services, supplies and equipment.

V. 8. 23. The net increase of $1000 for seminars, symposia and conferences is insufficient to cover the price increases and entails a programme reduction. In order to keep expenditure within the limits of available funds, it is considered necessary to reduce the estimates for scientific activities covered under "Other items of expenditure" by $2800, which, because of price increases, entails a programme reduction of $13 500. Should, however, additional funds become available from UNDP, it will be possible to increase the scientific activities.

V. 8. 24. For 1974 it is expected that costs will increase by $54 000, of which only about $10 000 represents a programme increase.

V. 8. 25. The level of support proposed for the Trieste Centre from the Agency's Regular Budget is based upon an agreement reached with UNESCO with respect to the joint operation of the Centre for the period 1973-1978. To effect the changes outlined above it is proposed to increase the annual contribution to the Centre from $150 000 in 1972 to $155 000 in 1973 and to $181 000 in 1974, which will be matched by UNESCO.

V. 8. 26. The present agreement with the Italian Government for financing the Centre provides for annual payments by the Government of $250 000 for six academic years ending with the period 1973-74. The Government has proposed to increase its annual contribution to $350 000 per academic year beginning in 1974-75, provided that both the Agency and UNESCO increase their contributions to $200 000 per year, adjusted for the cost or price increases that may occur In order to be able to accept this generous offer from the Government the Agency and UNESCO propose to increase their financial support to the level of $181 000 in 1974, of which $100 000 would be reserved for the last half of the calendar year, which would correspond to the first half of the academic year 1974-75. The extension of the life of the Centre on this basis will enable it to reach the

minimum level of assured financial support recommended by the Scientific Council of the Centre, which indicated that an annual budget of between $750 000 and $1 100 000 would be desirable for the Centre's continued operation.

V.8.27. In summary, it is assumed that in addition to the amount available from the Regular Budget of the Agency, namely $155 000 for 1973 and $181 000 for 1974, the income for the Centre under Operating Fund I will be as follows:

	1973	1974
Italian Government	250 000	300 000
Ford Foundation	50 000	-
UNESCO (counterpart to Regular Budget contribution)	155 000	181 000
SIDA	66 000	66 000
Miscellaneous	30 000	32 000
	551 000	579 000

To the extent that funds are made available by UNDP it will be possible to provide additional financial resources for the scientific activities of the Centre.

9. NUCLEAR POWER AND REACTORS

Summary of costs

Table V. 9. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	384 194	442 000	43 800	-	43 800	485 800	508 000
Consultants	6 098	8 600	800	600	1 400	10 000	11 000
Overtime	54	200	-	100	100	300	400
Temporary assistance	-	1 000	100	-	100	1 100	1 200
Sub-total	390 346	451 800	44 700	700	45 400	497 200	520 600
Common staff costs	142 934	152 400	6 800	-	6 800	159 200	167 600
Travel	18 804	20 800	2 700	9 000	11 700	32 500	35 600
Meetings							
Panels and committees	28 712	54 000	5 500	2 000	7 500	61 500	68 000
Seminars, symposia and conferences	22 973	58 000	6 000	6 500	12 500	70 500	77 000
Representation and hospitality	1 776	2 000	100	-	100	2 100	2 200
Scientific and technical contracts	67 623	95 000	4 000	(11 000)	(7 000)	88 000	88 000
Scientific supplies and equipment	45	-	-	-	-	-	-
Common services, supplies and equipment	9 481	-	-	-	-	-	-
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	682 694	834 000	69 800 8.3%	7 200 0.9%	77 000 9.2%	911 000	959 000

Summary of manpower

Table V. 9. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	1	1	1	-	1	1
P-5	11	11	11	-	11	11
P-4	6	6	6	-	6	6
P-3	3	3	3	-	3	3
P-2	2	2	2	-	2	2
P-1	-	-	-	-	-	-
Sub-total	23	23	23	-	23	23
GS	13	13	13	-	13	13
M&O	-	-	-	-	-	-
TOTAL	36	36	36	-	36	36

THE PROGRAMME

OBJECTIVE

V. 9. 1. The objective is to disseminate information on the technology and economics of nuclear power, reactors, nuclear fuels and materials, to provide assistance and advice to Member States in the application of nuclear power for generating electricity and for water desalination, and to facilitate the use of research reactors for research and training.

RESULTS TO DATE

V. 9. 2. The programme was initiated in 1959. Advice on the exploration and evaluation of uranium resources has been given to many developing countries, and two UNDP projects in Greece and Pakistan are being serviced. Advisory missions on nuclear power have been sent to several countries, some of which have since started nuclear programmes, and one UNDP project in the Philippines is being serviced. An annual review of operating experience with power reactors was initiated in 1969, and meetings, panels and symposia on many aspects of reactor technology have been held. Several study groups on research reactor utilization have been convened and three co-ordinated programmes have been sponsored, namely the joint Norway/Agency research programme in reactor physics with the zero-power reactor "NORA", the co-operative research project in reactor physics between the Agency and the Governments of Norway, Poland and Yugoslavia, and the joint training and research project between India, Philippines and the Agency, using a neutron crystal spectrometer.

PLANS FOR 1973-78

V. 9. 3. In 1973-78 a number of developing countries will be ordering, constructing or commissioning their first nuclear power stations. Many large nuclear power stations, mainly using light-water reactors, will begin commercial operation. Both advanced thermal reactors and prototype fast reactors will be constructed and brought into operation.

V. 9. 4. These developments are reflected in the programme, in which more emphasis will be placed on the introduction of nuclear power into developing countries, the analysis of the operating experience gained with commercial nuclear power stations, and the newer types of reactor now under development. At the same time an increased effort will be devoted to exploration and evaluation of uranium resources in developing countries and to fuel cycle and fuel management problems.

V. 9. 5. In order to make manpower and resources available for these activities, there will be a reduction in the programme in some areas of power reactor technology and of research reactor and reactor physics work. The effort devoted to technical assistance matters will be maintained and it is hoped to make provision for more advisory services. The work relating to advanced nuclear projects such as ship propulsion and magneto-hydrodynamics will be continued at the present level.

RELATED ACTIVITIES

V. 9. 6. The related activities include the award of research contracts and the conclusion of research agreements. Four co-ordinated research programmes have been initiated which deal with reactor burn-up physics, neutron scattering, dynamics and digital computer control of power reactors, and small- and medium-power reactors; there are

also about 15 research contracts dealing with specific topics. One or two training courses are held and four or five advisory missions are sent to Member States each year; requests for such assistance are expected to increase.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.9.7. The programme involves co-operation with the United Nations and its Regional Commissions, FAO, IBRD, UNIDO, UNDP, OECD(NEA), EURATOM, the World Energy Conference, the International Electrotechnical Commission and the International Federation for Automation and Control.

STRUCTURE

V.9.8. This programme consists of 12 sub-programmes which are dealt with separately below.

SUB - PROGRAMMES

URANIUM RESOURCES

OBJECTIVE

V.9.9. The objective is to assist Member States in the development of uranium and other nuclear material resources.

STRUCTURE

V.9.10. This sub-programme consists of two components which are described in the following paragraphs.

Exploration for uranium reserves

Objective

V.9.11. The objective is to collect accurate data on world uranium reserves and resources, to encourage the use of a uniform estimating and reporting system and to assist developing countries in exploration projects.

Results to date

V.9.12. This component was initiated in 1968. The world's nuclear raw materials resources, production and demand have been reviewed and reports published at approximately two-year intervals. As a direct or indirect result of Agency assistance, some 17 developing countries have begun active uranium exploration programmes in the last four years.

Plans for 1973-74

V.9.13. The OECD(NEA)/IAEA Joint Working Party will continue to review uranium resources. More emphasis will be placed on developing uranium exploration and evaluating techniques through meetings and research activities. One symposium is foreseen for this period.

Related activities

V.9.14. Two research contracts on uranium exploration techniques will be awarded in 1973-74. The number of technical assistance projects will increase; two UNDP large-scale

projects and eight other projects are foreseen. The Laboratory will carry out uranium ore analysis for technical assistance programmes.

Plans for 1975-78

V.9.15. Extra work will be required to meet the increasing demand for uranium for nuclear power generation in the second half of the present decade.

Co-operation with other organizations

V.9.16. This component involves co-operation with OECD (NEA) in a working party on uranium resources, production and demand.

Processing of uranium ores

Objective

V.9.17. The objective is to encourage the development of cheaper and more effective processes for the treatment of radioactive ores, particularly in developing countries which have little or no high-grade uranium ores.

Results to date

V.9.18. This component was initiated in 1971. A project to investigate the bacterial leaching of uranium ores has just been started and the first results are expected in 1973.

Plans for 1973-74

V.9.19. The bacterial leaching of uranium ores will be investigated and progress reviewed at research co-ordination meetings. A training course on the processing of uranium ores will be arranged in 1973 or 1974 for specialists from developing countries in all regions where uranium and thorium production is foreseen in the next ten years. A panel on uranium ore processing and a symposium on uranium supply are planned for 1974.

Related activities

V.9.20. Research contracts will be awarded in 1973-74, in which eight to ten institutions will participate. One training course is planned and requests for assistance are expected.

Plans for 1975-78

V.9.21. The project on bacterial leaching will be reviewed in 1976. Other contracts on uranium ore processing are foreseen for this period.

FUEL TECHNOLOGY

OBJECTIVE

V.9.22. The objective is to assist the developing countries to obtain the fuel services they require and to foster the exchange of information between all countries involved in the development of fuel fabrication and reprocessing technology.

STRUCTURE

V.9.23. This sub-programme consists of two components which are described in the following paragraphs.

Fuel element technology

Objective

V. 9. 24. The objective is to advise developing countries on fuel element technology, on new types of nuclear materials and on the training of specialists.

Results to date

V. 9. 25. This component was initiated in 1967. Within the last five years, a number of Agency publications has been produced which have served to identify the main economic and technical features in fuel element technology.

Plans for 1973-74

V. 9. 26. A panel on fuel fabrication with emphasis on the cladding and structural materials will be held. It is expected that there will be several requests for advice on fuel element fabrication. The performance of fuel elements in commercial power reactors will continue to be reviewed and evaluated.

Related activities

V. 9. 27. Several requests for fellowships and experts are expected in 1973-74.

Plans for 1975-78

V. 9. 28. During this period some developing countries will be commissioning their first reactors and it is expected that there will be a continuous need for fuel advisory services. Operating experience with advanced thermal and fast reactors will begin to be accumulated and the performance of the fuel in these reactors will be studied and reviewed at meetings or symposia.

Fuel reprocessing

Objective

V. 9. 29. The objective is to analyse the latest achievements in fuel reprocessing and to advise developing countries regarding the reprocessing of spent fuel elements.

Results to date

V. 9. 30. This component was initiated in 1965. The exchange of information on fuel reprocessing methods and techniques has been encouraged by holding scientific meetings.

Plans for 1973-74

V. 9. 31. Efforts will be directed towards adapting the aqueous technology for the reprocessing of different types of spent fuel elements, including highly irradiated fuel. A permanent working group may be organized if this seems desirable.

Plans for 1975-78

V. 9. 32. Taking into account the development of fast reactors, more attention will be paid to reprocessing of fuel from this type of reactor, to further improvements of aqueous and non-aqueous methods and to the development of new facilities and techniques for reprocessing. Working groups, panels, or symposia will be organized.

SUPPLY OF SPECIAL NUCLEAR MATERIALS

OBJECTIVE

V.9.33. The objective is to ensure the supply of special nuclear materials to requesting Member States.

RESULTS TO DATE

V.9.34. This sub-programme was initiated in 1959. Nuclear materials have been supplied in response to 111 requests from 33 States.

PLANS FOR 1973-74

V.9.35. The technical soundness of requests for materials will be analysed as well as possibilities, terms and conditions of supply. Agreements with requesting and supplying Member States will be prepared and their implementation supervised.

PLANS FOR 1975-78

V.9.36. The work in question is of a continuing nature, and its magnitude will depend on requests from Member States.

RESEARCH REACTORS

OBJECTIVE

V.9.37. The objective is to promote the fruitful exploitation of research reactors, especially in small centres, and to help co-ordinate research reactor projects.

STRUCTURE

V.9.38. This sub-programme consists of two components which are described in the following paragraphs.

Utilization of research reactors in developing countries

Objective

V.9.39. The objective is to promote effective utilization of research reactors in developing countries.

Results to date

V.9.40. This component was initiated in 1962. Regional meetings, attended by a relatively large number of technical people, have permitted concentration of research on topics of specific regional interest. There has been a significant amount of information exchange, personal contact and regional collaboration in a variety of technical areas, such as reactor operation safety and maintenance, solid-state physics, activation analysis, isotope production and neutron radiography.

Plans for 1973-74

V.9.41. Study group meetings are planned for the regions of South East Asia and Latin America to review previous experience and new developments in the use of research reactors in specific areas of research and engineering applications.

Co-ordinated research programmes in such subjects as activation analysis are planned for various developing regions. The organization of such programmes will be undertaken in close co-operation with the Department of Research and Isotopes.

Plans for 1975-78

V.9.42. As nuclear power and technology become more firmly established in the various developing regions, the need for the study group programme can be expected to diminish sufficiently to permit consideration of a phasing out of this activity. Although one or two additional study group meetings may still be held, it is anticipated that this programme will be terminated during this period. When it is terminated the Agency should encourage the setting up of different regional-sponsored co-operative research projects under the leadership of the more advanced of the relevant regional Member States.

New developments in the use of advanced research reactors

Objective

V.9.43. The objective is to provide for the exchange among Member States of information on new developments in nuclear technology involving the use of advanced research reactors.

Plans for 1973-74

V.9.44. This component was initiated in 1971. Several new advanced research reactors, such as LOFT (loss of fluid test reactor), IBR-2 (pulsed fast reactor-2), PBF (power burst facility) and the Franco-German High-Flux Research Reactor, have recently been constructed or are now under construction. Discussion of the design objectives, special features and applications of these high-flux reactors is of interest, and for this purpose a meeting on new developments in regard to high-flux reactors will be held. Another meeting will be arranged to exchange information on major experimental and analytical efforts in regard to the physics of reactors under abnormal operating conditions. A symposium on advanced research reactors is planned for 1974.

Plans for 1975-78

V.9.45. A continuing need is anticipated for selected meetings dealing with advances in reactor research and development in this period, particularly in regard to fast reactors and high-temperature reactors.

ENERGY FORECASTS

OBJECTIVE

V.9.46. The objective is to assess nuclear power prospects by preparing forecasts of supply and demand in regard to primary energy, electric power and nuclear power on a national, regional and world basis.

RESULTS TO DATE

V.9.47. This sub-programme was initiated in 1965. The Agency's forecasts are used and quoted by industry, Governments and other international organizations in power surveys.

PLANS FOR 1973-74

V.9.48. Existing data will be analysed critically, evaluated and made available to Member States through publications and training courses, and information for planning the implementation of safeguards will be provided.

PLANS FOR 1975-78

V.9.49. Evaluation and analysis for up-dating purposes are necessarily continuous since national programmes are periodically revised and new fossil and nuclear fuel resources discovered and developed. Periodic reports to the General Conference and lectures for training courses will be prepared.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.9.50. This sub-programme involves the joint sponsorship of meetings and studies with the United Nations and its Regional Commissions.

ECONOMIC EVALUATIONS OF NUCLEAR AND CONVENTIONAL POWER

OBJECTIVE

V.9.51. The objective is to provide evaluations and forecasts of investment and fuel costs for nuclear and conventional power stations and to carry out economic comparisons of these costs on a consistent basis in order to maintain an up-to-date picture of the present and future competitive status of nuclear power.

RESULTS TO DATE

V.9.52. This sub-programme was initiated in 1960. The results of a series of surveys on the present status, future trends and methods for comparison of power costs have been made available to Member States through publications, lectures at training courses, regional study groups and special advisory missions.

PLANS FOR 1973-74

V.9.53. In 1973 a symposium on the fuelling of nuclear power plants, with special emphasis on costs, is expected to be held. Both in 1973 and in 1974 reviews and lectures for training courses will be prepared. A revision of the economic survey of petroleum will be carried out in 1973, and its results will be used for the market survey of nuclear power plants in developing countries.

RELATED ACTIVITIES

V.9.54. One training course will be held in 1973 or 1974.

PLANS FOR 1975-78

V.9.55. Investment and fuel costs of nuclear and conventional power stations are rapidly changing, and the evaluations and forecasts of such costs must therefore continue to be made. Surveys, reports and lectures will be prepared each year on nuclear investment and fuel costs for presentation to training courses or for circulation to Member States. The economic survey of conventional fuel and

especially of oil prices initiated in 1968 will be periodically up-dated. Models and computer programmes for national and international analyses of the economic status of nuclear power will be developed. Requests for advice by Member States to assist in the economic assessment of power projects are expected to increase.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.9.56. Symposia and meetings are jointly sponsored with the United Nations and its Regional Economic Commissions.

NUCLEAR POWER PROJECT IMPLEMENTATION

OBJECTIVE

V.9.57. The objective is to assist developing countries in the early stages of planning and implementing nuclear power projects.

STRUCTURE

V.9.58. This sub-programme consists of three components which are described in the following paragraphs.

Assistance in nuclear power planning

Objective

V.9.59. The objective is to supply guidance and advice to developing countries in the assessment and implementation of nuclear power projects.

Results to date

V.9.60. This component was initiated in 1959. A series of training courses on the technical and economic aspects of nuclear power, reviewing critically the latest developments in technology and costs, has been held. Special missions and advisory services requested by Argentina, Brazil, Chile, Egypt, Greece, Korea, Pakistan, Peru, Philippines and Thailand have in several cases contributed to the initiation of nuclear power programmes. A handbook covering the main steps in the implementation of a nuclear power programme has been prepared.

Plans for 1973-74

V.9.61. It is expected that a number of requests for assistance will be received and met as far as resources of money and manpower permit. A training course on some aspects of the introduction of nuclear power is planned as well as a meeting on possible sources and methods of financing nuclear power projects.

Related activities

V.9.62. The related activities in 1973-74 will consist of one training course and several advisory missions.

Plans for 1975-78

V.9.63. Requests for advisory services are expected to continue and increase because of the growing demand for nuclear power plants in developing countries.

Co-operation with other organizations

V. 9. 64. This component involves co-operation with UNDP in special projects, for example a Philippines study in 1972, and with IBRD and national and regional financing organizations in regard to terms for providing finance.

Nuclear power market survey

Objective

V. 9. 65. The objective is to make a detailed assessment of the potential demand for nuclear plants in selected developing countries which have shown an active interest in nuclear power.

Results to date

V. 9. 66. This component was initiated in 1971. Advisory missions in various developing countries have helped to ascertain nuclear power prospects in special cases, but only very general forecasts have been made. No detailed comprehensive survey has as yet been carried out on a world basis.

Plans for 1973-74

V. 9. 67. The market survey, initiated in 1972, will extend to 1973 since coverage of about 12 countries is contemplated as a first step. An effort to carry out the survey in an additional ten countries may be considered for 1973 and 1974.

Plans for 1975-78

V. 9. 68. The market study will require periodic up-dating.

Small- and medium-sized reactors

Objective

V. 9. 69. The objective is to determine the prospects of small- and medium-sized reactors of standardized design which are of special interest for developing countries.

Results to date

V. 9. 70. This component was initiated in 1960. A series of studies and reports has been produced which have indicated the desirability of some standardization and led to research agreements on this subject.

Plans for 1973-74

V. 9. 71. Through research agreements the possibilities of standardization will be investigated. Meetings are proposed on reactor standardization and on techniques of project management for nuclear power plants.

Plans for 1975-78

V. 9. 72. The programme will be reviewed in the light of the conclusions reached in the 1973-74 meetings.

OPERATION OF NUCLEAR POWER PLANTS

OBJECTIVE

V. 9. 73. The objective is to promote the exchange of experience and information concerning the technological and engineering aspects of nuclear power reactor systems.

STRUCTURE

V.9.74. This sub-programme consists of four components which are described in the following paragraphs.

Nuclear power station operation

Objective

V.9.75. The objective is to collect, analyse and publish annual reports on operating experience with nuclear power stations in Member States, and to facilitate the exchange of information on means of assessing and improving the reliability of nuclear power stations.

Results to date

V.9.76. This component was initiated in 1969. In 1970 and in 1971 an annual report was published which covered the operating experience in the previous year.

Plans for 1973-74

V.9.77. By the end of 1974 the number of nuclear power stations in operation will be about 220, as compared with 98 at the end of 1970. It is believed that during this period commercial nuclear power will become firmly established because of the expected high availability factors and low outage rates. The Agency's activities will be directed to disseminating the knowledge available through reports and meetings.

Plans for 1975-78

V.9.78. Nuclear power station operation will become of greater interest to developing Member States. During this period information on the problems encountered will be provided in reports and discussed at meetings.

International Working Group on Nuclear Power Plant Control and Instrumentation

Objective

V.9.79. The objective is to advise on possible Agency activities in the area of reactor control and instrumentation, to study and review the technology and to find means of helping developing countries.

Results to date

V.9.80. This component was initiated in 1970. The International Working Group on this subject met for the first time in March 1971. It proposed the holding of several meetings of specialists to review in detail various specific topics of importance. The first of these specialists' meetings, held in October 1971, studied the use of computers in power plant operation.

Plans for 1973-74

V.9.81. In addition to meetings of specialists on in-core instrumentation, special control problems and the determination of reactor dynamic characteristics, a symposium will be devoted to a general review of the subject in 1973. Also under consideration is a survey of the present utilization of computers in nuclear programmes, as related to regional nuclear computing centres that might be established in collaboration with the relevant United Nations organizations.

Related activities

V.9.82. The related activities in 1973-74 will include the award of research contracts and the conclusion of research agreements. Eight to ten countries will participate in the co-ordinated programme on digital computer control. A training course on reactor control and instrumentation is planned.

Plans for 1975-78

V.9.83. It is expected that the Working Group will continue to prepare pertinent review articles and manuals and to organize meetings, training courses and co-ordinated research programmes, particularly on the subjects of research on safety and power reactor management.

Co-operation with other organizations

V.9.84. Activities are co-ordinated with the International Electrotechnical Commission and the International Federation for Automation and Control.

International Working Group on Reactor Radiation Measurements

Objective

V.9.85. The objective is to advise on possible Agency activities in reactor dosimetry, including meetings for the exchange of information and the preparation of reviews and studies.

Results to date

V.9.86. This component was initiated in 1967. Two Agency documents prepared by members of the Working Group have been published (Neutron Fluence Measurements, in 1970, and Absorbed Dose in Reactors, in 1971). An international intercomparison of calorimeters was carried out in 1970.

Plans for 1973-74

V.9.87. With the completion of a status report on cross-section data, the planned activities of the Working Group of interest to the Agency will have been completed. Consequently, unless the need to carry out work on this subject which would be of significance to the Agency is clearly established, consideration will be given to phasing out this programme.

Nuclear facilities directory

Objective

V.9.88. The objective is to produce reference lists and directories of nuclear facilities.

Results to date

V.9.89. This component was initiated in 1959. Nine volumes of the Directory of Reactors had been issued by the end of 1971. The List of Power and Research Reactors in Member States was first published as a review publication in 1969. These publications have become standard reference sources and have attracted considerable attention among users of reactors all over the world.

Plans for 1973-74

V.9.90. Volume X of the Directory of Reactors, dealing with power and test reactors, will be issued in early 1973. However, it is felt that the Directory of Reactors in its present form has served its purpose and that in the future detailed information on the design of commercial power reactors need not be provided. Instead, the essential data on new nuclear power plants will be summarized in the annual reports entitled Operating Experience with Nuclear Power Stations in Member States.

V.9.91. A special issue of the Directory of Reactors dealing with advanced thermal or fast breeder reactors, where basic design data could still be of considerable interest to scientists and engineers, may be justified.

V.9.92. The List of Power and Research Reactors in Member States will be continued on an annual basis, and it is intended to expand it to cover other nuclear facilities. A working group and a symposium on nuclear power plant control and instrumentation will be held.

Plans for 1975-78

V.9.93. A special volume of the Directory of Reactors may be issued if appropriate. The list of nuclear facilities will be continued.

REACTOR ENGINEERING AND COMPONENTS

OBJECTIVE

V.9.94. The objective is to co-ordinate international efforts in regard to reactor engineering and components.

STRUCTURE

V.9.95. This sub-programme consists of three components which are described in the following paragraphs.

International Working Group on Pressure Vessels

Objective

V.9.96. The objective is to co-ordinate international work and exchange information on inspection techniques and on standardization.

Results to date

V.9.97. This component was initiated in 1967. A co-ordinated research programme on pressure vessel steels, involving 11 Member States, is under way.

Plans for 1973-74

V.9.98. Meetings on steel and concrete pressure vessels and other meetings of specialists will be held, as recommended by the working group on pressure vessels and containment structures.

Related activities

V.9.99. The related activities in 1973-74 will include the award of research contracts, the conclusion of research agreements, and a co-ordinated research programme involving 11 countries.

Plans for 1975-78

V.9.100. It is expected that the working group will continue its work, placing more emphasis on inspection techniques and on standardization.

Co-operation with other organizations

V.9.101. This component involves co-operation with OECD (NEA) and EURATOM to ensure that similar design and safety criteria are used.

Non-destructive testing of reactor components and fuel assemblies

Objective

V.9.102. The objective of this component, which was initiated in 1971, is to further the prompt exchange of information on non-destructive testing and to help the developing countries in using the techniques involved.

Plans for 1973-74

V.9.103. A working group on non-destructive testing may be established. It would make proposals for meetings of specialists and other means, including training courses, designed to encourage the use of non-destructive testing techniques in developing countries.

Plans for 1975-78

V.9.104. The work to be done will depend on the recommendations of the working group.

Heat and mass transfer

Objective

V.9.105. The objective is to provide better co-ordination between Member States in regard to heat and mass transfer phenomena and to disseminate information on new developments in this field in order to increase the economic benefits and to improve the reliability and safety of nuclear power plants.

Plans for 1973-74

V.9.106. This component was initiated in 1970. A co-ordinating meeting on heat and mass transfer is proposed. The plans for future work will be reviewed in 1974.

ADVANCED REACTORS

OBJECTIVE

V.9.107. The objective is to provide for the exchange of information on the technology of fast-breeder reactors, improved thermal reactors and plutonium and thorium utilization.

STRUCTURE

V.9.108. This sub-programme consists of three components which are described in the following paragraphs.

International Working Group on Fast Reactors

Objective

V.9.109. The objective is to assist Member States developing fast-breeder reactors in reviewing the progress of their national programmes, to exchange information, to co-ordinate international meetings, to agree on topics for specialists' meetings and to advise the Agency on its programme.

Results to date

V.9.110. The component was initiated in 1968. The Agency's International Working Group on Fast Reactors was organized in 1968 and seven countries with major fast reactor programmes are participating. The Working Group has sponsored or supported one or more international symposia per year. The meetings of specialists have dealt with such problems as fast-reactor spectrum measurements, sodium-water reactions, sodium fires and fuel-cladding materials.

Plans for 1973-74

V.9.111. In view of the increasing effort devoted to, and emphasis on, the liquid-metal-cooled fast-breeder reactors, the Agency's role in co-ordinating work and disseminating information will increase. A symposium on fuel and fuel elements for fast reactors will be held in 1973. Four specialists' meetings per year are planned and special review reports will be published.

Plans for 1975-78

V.9.112. The start-up and operation of several prototype and demonstration plants in France, the Federal Republic of Germany, Japan, the Soviet Union and the United Kingdom, as well as the operation of the fast-flux-test facility in the United States of America, will yield valuable data for larger liquid-metal fast-breeder reactors. It will be useful to have a meeting on the commissioning and operation of prototype fast reactors. Depending on the performance of sodium-cooled fast reactors and the experience with high-temperature reactor technology, there may be more interest in the gas-cooled fast reactor and a meeting thereon may be sponsored.

Co-operation with other organizations

V.9.113. This component involves attendance at OECD (NEA) meetings.

Advanced thermal reactors

Objective

V.9.114. The objective is to encourage the exchange of information on reactors which will be of particular interest in the near future, such as high-temperature and advanced gas-cooled reactors and certain heavy-water reactor systems which hold out the promise of lower generating costs than existing light-water reactors.

Results to date

V.9.115. This component was initiated in 1968. The Agency has been keeping abreast of the developments in these systems. Symposia on this subject have been organized and these reactors have been a topic for discussion at other scientific meetings.

Plans for 1973-74

V.9.116. Although light-water and existing heavy-water reactors will continue to dominate the market and offer competition to any new systems, there will be important developments in certain other types, such as high-temperature reactors, advanced gas-cooled reactors and heavy water boiling light water reactors. A symposium on heavy-water reactors and/or high-temperature reactors will be held in 1973.

Plans for 1975-78

V.9.117. Sufficient new information on the operation and new development work relating to high-temperature reactors will be available to warrant the holding of a symposium on the subject in the period 1975-76. Heavy-water organic cooled reactors and molten-salt reactors may also be dealt with at smaller technical meetings.

Plutonium and thorium use

Objective

V.9.118. The objective is to review and report upon the latest developments in the technology of the use of plutonium and thorium in thermal reactors.

Results to date

V.9.119. This component was initiated in 1964. The Agency convened one international symposium, in 1967, and three panels, in 1964, 1968 and 1971 respectively, on plutonium; the proceedings of the meetings have provided useful reviews and data for the designers and utilities. A panel and a working group meeting, held in 1965 and 1968 respectively, discussed the ways in which thorium could be utilized.

Plans for 1973-74

V.9.120. The panel on plutonium held in 1971 recommended that the Agency should continue its work on the subject and that another panel, dealing mainly with economics and plutonium fuel management, should be held in 1973 or 1974, when substantially more information from the fast-breeder reactor demonstration programmes is likely to be available, in order to give guidance on the timing of the introduction of fast reactors and on plutonium fuel technology. The subject of thorium technology will be discussed at a meeting on high-temperature gas reactors and other systems.

Plans for 1975-78

V.9.121. It is expected that by 1975 the plutonium fuel technology for recycling in thermal reactors will be well established and that after 1976 the emphasis will shift to establishing the technology for using plutonium as fuel for fast-breeder reactors.

V.9.122. When significant new information becomes available on thorium technology, a panel meeting may be convened.

MULTI-PURPOSE APPLICATIONS

OBJECTIVE

V.9.123. The objective is to assist Member States in assessing the role that nuclear energy can play in meeting metropolitan area water requirements, and to define the long-range potential of energy centres for accelerating industrial development and of agro-industrial complexes for the development of arid lands.

RESULTS TO DATE

V.9.124. This sub-programme was initiated in 1963. The Agency has become a focal point for the dissemination of technical information on developments in this area. Agency missions and study teams have visited ten Member States. Several long-range programmes have been influenced by the Agency's recommendations.

PLANS FOR 1973-74

V.9.125. Either a seminar on agro-industrial complexes or a symposium on nuclear desalination may be held, and some publications on nuclear desalination topics are planned.

RELATED ACTIVITIES

V.9.126. In 1973-74 four or five research contracts will be awarded, two or three advisory missions on nuclear desalination and agro-industrial complexes will be provided and one or two study tours of nuclear desalination research and development centres will be organized.

PLANS FOR 1975-78

V.9.127. One or two meetings on various multi-purpose applications are planned for each year. In addition, four to six special missions are planned for this period.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.9.128. The Agency's activities are reported to United Nations organizations through the Sub-Committee on Water Resources of ACC, and there is co-operation with FAO and UNIDO in regard to agro-industrial complexes.

ADVANCED NUCLEAR TECHNOLOGY

OBJECTIVE

V.9.129. The objective is to provide for the co-operative exchange of information on special applications of nuclear technology and to ensure the exchange of the latest information on magnetohydrodynamics (MHD).

RESULTS TO DATE

V.9.130. The work relating to the exchange of information on MHD was initiated in 1966. The Joint OECD (NEA)/IAEA Liaison Group on MHD Electric Power Generation has been instrumental in providing for the exchange of information among those countries having a strong interest in MHD research and development, primarily through the two international conferences organized by the Group since its establishment in 1967 and through the preparation of periodic status reports on the subject.

PLANS FOR 1973-74

V.9.131. A conference to review the advances in MHD is planned for 1974 (by which time substantial operating experience with some new large-scale open-cycle generators will have been gained) and to review the results of important new projects on closed-cycle systems. During this period the Agency will, as required, sponsor one or two meetings of the Joint OECD (NEA)/IAEA Liaison Group.

V. 9. 132. A meeting on high-temperature reactors for closed-cycle MHD applications may be organized in conjunction with other meetings in 1973 or 1974.

PLANS FOR 1975-78

V. 9. 133. The importance of the work in question and the interest shown by a number of countries, including developing countries, will be reviewed to determine whether it is appropriate to continue this work.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 9. 134. No changes in manpower are foreseen for 1973 or 1974.

COSTS

V. 9. 135. For 1973 it is expected that the cost of this programme will increase by $77 000, of which $69 800 represents salary and other price increases and $7200 a small increase in the programme. The cost of salaries and related common staff costs for established posts are expected to increase by $50 600, and the cost of consultants' services and temporary assistance by $900. Price increases of $2700 for travel and $11 600 for meetings and related hospitality are mainly attributable to increases in air fares and per diem rates. The increase in the cost of research contracts is $4000.

V. 9. 136. There will be a shift in the provision of funds from research contracts to scientific meetings and advisory services and missions. A programme increase of $9000 for travel will enable the Agency to meet the requests for advisory services and special missions. Further programme increases of $8500 for meetings and $700 for consultants' services and overtime are foreseen. These increases are partly offset by a programme reduction of $11 000 in respect of scientific and technical contracts.

V. 9. 137. For 1974 an increase of $48 000 in the cost of this programme is foreseen, which will be mainly attributable to salary and price increases.

10. NUCLEAR SAFETY AND ENVIRONMENTAL PROTECTION

Summary of costs

Table V. 10. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	249 190	308 000	28 200	-	28 200	336 200	353 300
Consultants	10 278	14 300	1 200	-	1 200	15 500	15 500
Overtime	1	200	-	-	-	200	200
Temporary assistance	-	200	-	-	-	200	200
Sub-total	259 469	322 700	29 400	-	29 400	352 100	369 200
Common staff costs	92 157	105 800	4 300	-	4 300	110 100	116 500
Travel	21 184	17 800	2 000	6 700	8 700	26 500	32 500
Meetings							
Panels and committees	32 608	53 000	5 000	54 500	59 500	112 500	107 000
Seminars, symposia and conferences	15 294	35 000	4 000	16 000	20 000	55 000	48 000
Representation and hospitality	1 425	1 700	100	-	100	1 800	1 800
Scientific and technical contracts	125 517	180 000	9 000	8 000	17 000	197 000	197 000
Scientific supplies and equipment	4 048	4 000	500	1 500	2 000	6 000	12 000
Common services, supplies and equipment	6 223	12 000	1 000	2 000	3 000	15 000	7 000
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	557 925	732 000	55 300 7.5%	88 700 12.1%	144 000 19.6%	876 000	891 000

Summary of manpower

Table V. 10. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	1	1	1	-	1	1
P-5	7	7	7	-	7	7
P-4	6	6	6	-	6	6
P-3	2	2	2	-	2	2
P-2	-	-	-	-	-	-
P-1	-	-	-	-	-	-
Sub-total	16	16	16	-	16	16
GS	11	11	11	-	11	11
M&O	-	-	-	-	-	-
TOTAL	27	27	27	-	27	27

THE PROGRAMME

OBJECTIVE

V.10.1. The objective is to ensure the safe operation of nuclear installations and the protection of man and his environment from the harmful effects of nuclear radiation and radioactive and non-radioactive releases from nuclear facilities.

RESULTS TO DATE

V.10.2. The programme was initiated in 1957. Work relating to radiological safety, waste management and nuclear safety has included the organization of 28 symposia and seminars, 75 panel meetings and nine research co-ordination meetings. One hundred and twenty publications have been issued, comprising the proceedings of 29 symposia, seminars and panel meetings, 42 publications in the Safety Series and 20 in the Technical Reports Series, 11 volumes of Research Abstracts and 18 other technical publications.

V.10.3. Thirty-two requests for special missions on reactor siting and on the safety assessment of various nuclear power plants have been met. In addition, some 15 advisory missions on radiological safety and waste management have been carried out. One local and three regional study group meetings have been organized and three study tours were held.

PLANS FOR 1973-78

V.10.4. The following activities will be carried out:

(a) The up-dating of health and safety standards and recommendations for the safe performance of nuclear activities;

(b) The promotion and co-ordination of research related to radiation protection of man and his environment, and the collection, exchange and dissemination of information on the results of such research and on developments in corresponding techniques and methods;

(c) The elaboration of the necessary measures concerning radiation protection, waste management and nuclear safety to be applied in new nuclear activities, such as the use of fast-breeder reactors and peaceful applications of nuclear explosions;

(d) The provision of assistance to developing countries in implementing radiation protection, waste management and nuclear safety measures.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.10.5. This programme involves co-operation with ILO, FAO, WHO, UPU, ECE, OECD (NEA), IATA, ICRP, IMCO, ISO, the Central Office for International Railway Traffic and EURATOM.

STRUCTURE

V.10.6. This programme consists of four sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

RADIOLOGICAL SAFETY

OBJECTIVE

V.10.7. To protect man and his property against possible damage resulting from the use, transport and storage of radioactive materials and from contamination of the environment. The work is co-ordinated where appropriate with the Dosimetry Section of the Division of Life Sciences.

RESULTS TO DATE

V.10.8. This sub-programme was initiated in 1957. Fourteen symposia and seminars, 41 panel meetings and four research co-ordination meetings have been organized. This work has resulted in the issuing of 15 volumes of proceedings and 26 publications in the Safety Series, of which six relate to the Agency's Safety Standards and have been approved by the Board of Governors for application in the Agency's work and in operations carried out with its assistance. In addition, seven publications in the Technical Reports Series, one Directory, and other documents, some of a recurring nature, have been issued.

PLANS FOR 1973-78

V.10.9. Work will continue in three basic areas:

(a) The preparation and harmonization of standards and recommendations for adequate protection of workers, members of the public and the human environment;

(b) The provision of assistance to Member States in applying these standards and recommendations and in training their specialists and technicians; and

(c) The provision of radiological protection services to the Agency's laboratories and to staff who may be exposed to radiation, including safeguards personnel.

V.10.10. During the past five years, emphasis has gradually shifted from the first to the second and third areas. This trend is expected to continue, although increased efforts will have to be devoted to the first area, as the need arises, to bring up to date existing standards and recommendations and to cover new topics.

RELATED ACTIVITIES

V.10.11. The related activities involve 93 research contracts, part of which relate to four co-ordinated programmes. The Agency's Safety Standards will be applied to all relevant projects and advisory services will be provided as requested.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.10.12. This sub-programme involves co-operation with ILO, FAO, WHO, UPU, ECE, OECD (NEA), IATA, ICAO, ICRP, ICRU, IMCO, ISO and the Central Office for International Railway Traffic.

STRUCTURE

V. 10. 13. This sub-programme consists of seven components which are described in the following paragraphs.

Safety standards for radiological protection

Objective

V. 10. 14. The objective is to prepare and up-date, as necessary, standards of safety for the protection of health and minimization of danger to life and property.

Results to date

V. 10. 15. This component was initiated in 1958. The Agency's Safety Standards comprise basic safety standards, specialized regulations and codes of practice. The Basic Safety Standards for Radiation Protection were published in 1967 and revised in 1972, and the Radiation Protection Standards for Radioluminous Timepieces, jointly prepared by the Agency and OECD (NEA), were published in 1967. Codes of practice have been issued on the following topics:

(a) Safe Handling of Radioisotopes, Safety Series No. 1 (1958 and 1962);

(b) Provision of Radiological Protection Services, Safety Series No. 13 (1965);

(c) Basic Requirements for Personnel Monitoring, Safety Series No. 14 (1965); and

(d) Radiation Protection in the Mining and Milling of Radioactive Ores, Safety Series No. 26 (1968).

Plans for 1973-74

V. 10. 16. A panel will be organized, if possible jointly with ILO, WHO and OECD (NEA), to prepare common standards on the basis of the revised recommendations which the ICRP is expected to formulate. Studies will also be undertaken in collaboration with OECD (NEA) with the aim of preparing standards for selected types of radioisotope-containing devices or products available to the public. Missions will be sent to nuclear facilities in Africa, Europe, the Far East, Latin America and the Middle East to advise on health and safety standards.

Related activities

V. 10. 17. The Agency's Safety Standards will be applied to projects implemented with the Agency's assistance.

Plans for 1975-78

V. 10. 18. Existing standards will be kept under review and revised when necessary. New standards will be prepared when a clear need exists. Continuing attention will be devoted, through regional study group meetings and advisory services, to the harmonization of national legislation for radiation protection. Health and safety missions to nuclear facilities in Member States will continue.

Co-operation with other organizations

V. 10. 19. This component involves co-operation with ILO, WHO, OECD (NEA) and ICRP in regard to consultations on uniform basic standards and joint organization of meetings.

Safe transport of radioactive materials

Objective

V. 10. 20. The objective is to provide a practical and concise set of rules which will enable national regulations to be harmonized and thus permit the safe and speedy international transport of radioactive materials.

Results to date

V. 10. 21. This component was initiated in 1958. The Agency's Regulations for the Safe Transport of Radioactive Materials have been adopted by almost all international bodies dealing with transport and are being increasingly incorporated in national laws; they were first issued in 1961 and in revised form in 1964, 1967 and 1972. Uniform transport regulations have facilitated safe and speedy international trade in nuclear materials. The most recent review of the Agency's regulations took account of improved technical knowledge and the extensive experience gained in implementing them. A handbook providing advice on technical and other non-regulatory topics has been prepared with a view to complementing the regulations.

Plans for 1973-74

V. 10. 22. Continuing efforts will be made to harmonize national regulations for the transport of radioactive materials and a meeting may be held to help in the establishment of uniform regulations. Information will be collected on transport accidents involving radioactive materials in order to provide confirmation of the effectiveness of the packaging and other requirements. A symposium is planned at which specialists will discuss packaging design, construction and testing, and other practical transport problems. Advisory services will be provided on the interpretation and implementation of the regulations.

Related activities

V. 10. 23. The related activities involve the award of two research contracts under a co-ordinated programme on performance tests for transport packagings.

Plans for 1975-78

V. 10. 24. The regulations will be reviewed at intervals of about ten years and hence no major revision should be called for in the period 1975-78. However, it is proposed that the views of Member States on the need for any revision should be sought at five-year intervals starting in 1977.

V. 10. 25. The advice provided on the implementation of the transport regulations will be revised at intervals of approximately two and a half years. Up-to-date lists of competent authorities will be issued annually, and detailed packaging designs, approved as meeting the regulatory requirements, will be issued as required. The provision of advisory services and the compilation of information on transport accidents will be continued.

Co-operation with other organizations

V. 10. 26. This component involves co-operation with UPU, ECE, IATA, IMCO, ISO and the Central Office for International Railway Traffic in the formulation of transport regulations.

Radiological protection of workers

Objective

V. 10. 27. The objective is to provide guidance on protection against possible radiation damage to persons who are occupationally exposed and to assist Member States in implementing the relevant recommendations.

Results to date

V.10.28. This component was initiated in 1958. Work has resulted in the publication of recommendations to Member States on the organization of radiological protection services, on physical and medical surveillance, including personnel and area monitoring systems, on protective clothing and devices, on emergency plans and procedures, on the handling of radiation accidents, and on the diagnosis and treatment of radiation injury. The proceedings of nine symposia and seminars have been published and ten manuals have been issued in the Safety Series and Technical Reports Series. Five training courses and three regional study group meetings have included the subject of radiological protection of workers and lectures have been given on radiation protection procedures at more than 12 training courses primarily dealing with other topics.

Plans for 1973-74

V.10.29. Priority will be given to the assessment of hazards in the mining and milling of nuclear materials and to the handling of transuranium elements. Symposia on these subjects and a seminar on the metabolic transport of internally deposited radionuclides will be held. Panels are planned on the assessment of radiological hazards in uranium and thorium mines, on particle size analysis in the estimation of airborne contamination, on the monitoring of soft radiation, and on radiological safety aspects of the operation of fuel reprocessing plants. A regional working group meeting on safety and environmental protection is proposed for countries in Europe, which would deal with selected topics relating to the radiological protection of workers, the general public and the environment. Guidance may be issued on such topics as radiological safety aspects of the operation of particle accelerators and neutron generators, the selection of suitable monitoring instruments, the decontamination of persons, equipment and facilities and the use of chelating agents in preventing the deposition of inhaled transuranium elements. The postal glass dosimeter intercomparison service for the calibration of gamma ray fields will be continued.

Related activities

V.10.30. The related activities involve about 30 research contracts, part of which relate to co-ordinated programmes on nuclear accident dosimetry and on transport packaging. Books of abstracts on research in health physics will continue to be issued each year. Training courses on radiological health and safety measures and on neutron monitoring, and a visiting seminar on radiological protection will be organized in 1973-74.

Plans for 1975-78

V.10.31. Greater emphasis will be placed on the organization of regional study group meetings and the provision of advisory services. Attention will be given to the problems which arise with the more widespread handling of plutonium and other transuranium elements and with the operation of further fuel reprocessing plants.

Co-operation with other organizations

V.10.32. This component involves co-operation with ILO, WHO and OECD (NEA) in the co-sponsoring of meetings.

Radiological protection of the general public and the environment

Objective

V.10.33. The objective is to provide guidance to Member States on procedures for evaluating hazards and providing radiation protection for the general public and the environment under normal and accident conditions.

Results to date

V.10.34. This component was initiated in 1958. The proceedings of four symposia and seminars have been published and seven manuals of guidance have been issued in the Safety Series and the Technical Reports Series. Five training courses and three regional study group meetings dealing primarily with general radiological protection have included discussions on the work in question. Lectures on radiological protection of the public have also been included in eight other training courses.

Plans for 1973-74

V.10.35. A symposium on environmental monitoring for nuclear facilities, and a seminar on protection of the public in the event of radiation accidents will be organized and a panel is planned to provide guidance on principles and methods for establishing derived working limits for radioactive contaminants in food chains. Another panel is planned on environmental monitoring techniques in order to bring up to date two earlier publications in the Safety Series. An attempt will be made to set up a regional co-ordinated research programme on environmental monitoring.

Related activities

V.10.36. The related activities involve ten research contracts on selected aspects of environmental monitoring, some of which relate to a co-ordinated research programme. Training courses will be organized on radiological health and safety measures.

Plans for 1975-78

V.10.37. An extension of the work is envisaged, in which attention will be devoted to problems related to expanding nuclear power programmes, to the determinations of actual population doses, and to methods of informing the public on the possible hazards of nuclear facilities.

Co-operation with other organizations

V.10.38. This component involves co-operation with FAO, WHO and ICRP in holding joint meetings.

Radiological safety features of the design, construction and operation of radioisotope laboratories

Objective

V.10.39. The objective is to provide guidance to Member States on the safety features of laboratories for handling high-activity radiotoxic materials.

Results to date

V.10.40. This component, which was initiated in 1965, has resulted in the publication of recommendations on radiation safety in hot facilities, on techniques for controlling air pollution arising from the operation of nuclear facilities and on safety aspects of the design and equipment of hot laboratories. The proceedings of a symposium have been published and two manuals have been issued in the Safety Series.

Plans for 1973-74

V.10.41. Work will continue on the provision of guidelines for the safety evaluation of hot laboratories and on the establishment of containment criteria for enclosures in which radionuclides of different levels of toxicity are handled. Advice will be provided, on request, on the design and construction of laboratories and handling facilities. A training film will be prepared on the safe handling of plutonium which will illustrate the containment and handling facilities.

Related activities

V.10.42. Advisory services will be provided on the design, equipment and operation of facilities for use of radioactive substances in medicine, agriculture, industry and research.

Plans for 1975-78

V.10.43. More emphasis will be given to advisory services, regional study group meetings and training courses.

Co-operation with other organizations

V.10.44. This component involves co-operation with ILO and WHO in regard to discussions of draft recommendations and attendance of meetings.

Radiological protection services for the Agency's laboratories and staff

Objective

V.10.45. The objective is to provide radiological protection services for the Agency's laboratories and for the staff who may be exposed to radiation in the course of their work.

Results to date

V.10.46. This component was initiated in 1963. Film badge and pocket dosimeter monitoring systems and whole-body monitoring and bio-assay services have been provided and dose records maintained for the staff of the Seibersdorf and Monaco laboratories and for safeguards inspectors. Radiological protection rules and procedures, based on the Agency's safety standards, have been established and kept up to date for all work involving possible exposure to radiation. A small stock of instruments has been maintained for use in emergencies.

Plans for 1973-74

V.10.47. Advice will continue to be given on safety aspects of the design and operation of new facilities, and appropriate training and instruction will be provided for staff members, in particular safeguards personnel. All monitoring instruments and protective clothing will be checked periodically. In addition, a consultant will be invited to review the safety features of the plutonium laboratory which the Agency may construct in Seibersdorf.

Related activities

V.10.48. The Laboratory will perform whole-body counting operations and provide bio-assay services.

Plans for 1975-78

V.10.49. The programme will be continued and extended to meet future requirements and cope with the increasing number of safeguards inspectors. The handling of records for the radioactive sources in the laboratories and for the doses received by staff will lead to an increase in work load.

Emergency assistance in the event of radiation accidents

Objective

V.10.50. The objective is to help Member States to obtain any additional emergency assistance that they might require in the event of a serious radiation accident.

Results to date

V. 10. 51. This component was initiated in 1961. The Nordic Agreement on Emergency Assistance was prepared in co-operation with the Legal Division and signed by Denmark, Finland, Norway, Sweden and the Agency in 1963. Model agreements for the provision of emergency assistance on a bilateral and multilateral basis have been prepared. Document WP/35, setting forth the nature of the emergency assistance that Member States might be willing to make available on request, was issued in collaboration with ILO, FAO and WHO in 1963 and brought up to date periodically. The Agency is prepared to act as intermediary and to send staff members to Member States on request. The emergency assistance system has been tried out at intervals.

Plans for 1973-74

V. 10. 52. The emergency assistance system will be maintained and tests will continue to be made at intervals. Additional equipment and replacement items will be provided as required. An emergency manual will be compiled. Member States will be invited to submit their emergency plans to the Agency for comment and advice.

Related activities

V. 10. 53. Radiochemical analysis of environmental samples and bio-assay measurements will be carried out by the Laboratory. A multichannel pulse height analyser and a sensitive gamma ray monitor can be made available on loan to a Member State if required in an emergency situation.

Plans for 1975-78

V. 10. 54. Tests of the emergency assistance system will be carried out at suitable intervals and further equipment will be added to stock when it seems appropriate to do so.

Co-operation with other organizations

V. 10. 55. This component involves co-operation with ILO, FAO and WHO in the collection and distribution of information and in the provision of assistance when appropriate.

WASTE MANAGEMENT

OBJECTIVE

V. 10. 56. The objective is to elaborate standards of safety concerning the discharges of radioactive waste into the environment to promote and co-ordinate research concerning the dispersion into the environment of radioactive materials; to promote and review techniques for maintaining releases of radionuclides and other contaminants from nuclear industry at levels acceptable to man and his environment; to assess the consequences of actual releases; to disseminate information and to advise Member States on the methods of safe management of radioactive waste.

RESULTS TO DATE

V. 10. 57. This sub-programme, which was initiated in 1957, has resulted in the publication of the proceedings of seven symposia, nine volumes in the Safety Series, 12 Technical Reports, seven volumes of Waste Management Research Abstracts and five other technical manuals. Ten symposia and seminars, 23 panel meetings and three research co-ordination meetings have been organized.

PLANS FOR 1973-78

V.10.58. The Agency will continue to promote useful research and to provide a forum for discussing future needs of waste management in all countries. These needs will be reviewed and relevant information on developed techniques will be disseminated to Member States through symposia, panels and guide-books.

V.10.59. The activities will also include a further study of the behaviour and fate of radionuclides released into the environment and of the consequences of such releases aimed at establishing safe limits for discharging radioactive wastes into various sectors of the environment.

RELATED ACTIVITIES

V.10.60. The related activities involve 20 to 25 research contracts, some of which relate to three co-ordinated programmes. Some three requests for technical assistance are anticipated and advisory services will be provided on request.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.10.61. This sub-programme involves co-operation with WHO and OECD (NEA).

STRUCTURE

V.10.62. This sub-programme consists of three components which are described in the following paragraphs.

Treatment and disposal of radioactive wastes

Objective

V.10.63. The objective is to review the management of wastes arising in atomic energy activities, to ensure that the waste management policies and practices of various countries are based on a harmonized set of principles that guarantee long-term protection of the public, to encourage the development of appropriate practices, and to review and disseminate the relevant information.

Results to date

V.10.64. This component was initiated in 1958. Methods for the treatment and disposal of low- and intermediate-level radioactive wastes have been reviewed and information on these methods made available to Member States. Numerous guide-books have been prepared and published in the Safety Series and Technical Reports Series. Since 1965, the Agency has also published each year volumes of abstracts on waste management research.

V.10.65. Management policies and practices for high-level wastes vary from country to country because of differing conditions, but there is a need for harmonization of the principles on which policies should be based and for a central review of the policies and methods employed. The proceedings of the first symposium on this topic were published in 1963 and a consultants' meeting was held in 1970.

V.10.66. A symposium is to be held in 1972, jointly with OECD (NEA) on the management of wastes from fuel reprocessing and a consultants' meeting is to be convened to consider the feasibility of establishing international storage and disposal sites for high-level and alpha-bearing wastes and to examine related technical problems. A panel is also being convened, in conjunction with the Soviet authorities, on the choice of burial conditions for radioactive concentrates as a function of their properties and activity level.

Plans for 1973-74

V. 10. 67. A symposium will be held on atmospheric transport of radioactive materials.

V. 10. 68. It is also planned to convene panels to discuss the following topics:

(a) Waste management systems for countries with small nuclear programmes;

(b) Review of the standardization of waste categories (initiated in 1967);

(c) Solidification of residues from waste treatment and suitable conditions for their burial to complete the final draft of a guide-book;

(d) International storage sites for radioactive wastes;

(e) Waste management in the uranium-thorium mining and milling industry; and

(f) Management of wastes arising from decontamination during emergency situations, in order to prepare a draft for a Safety Series Report.

V. 10. 69. Consultants' meetings will review the need to develop codes for the design of packaging for waste to be stored and disposed of and to discuss the technical problems related to the harmonizing of principles on which the various national and regional policies for long-term management of high-level and alpha-bearing radioactive wastes are to be based.

V. 10. 70. A guide-book will be prepared on the calcination and vitrification of high-level wastes.

V. 10. 71. A study tour will be organized to examine waste management techniques and programmes in Eastern and Central European countries.

Related activities

V. 10. 72. The related activities involve six to ten research contracts on management of low- and intermediate-level wastes. Two requests for technical assistance are expected, and study tours and training courses on waste management will be organized.

Plans for 1975-78

V. 10. 73. Efforts will be made to find ways of avoiding unduly expensive systems of treatment, not warranted by the waste management problems encountered.

V. 10. 74. As the number of fast-breeder reactors increases, they will have a growing impact on waste management practices. It is anticipated that fast breeders will not play a dominant role until late in this century. Nevertheless, the problem of management of wastes arising from the use of fast-breeder reactors will need to be carefully considered for some time and it is intended to convene panel meetings to discuss this topic.

V. 10. 75. Continuing efforts will be made to secure international co-operation in the harmonization of principles and in the review of national policies of waste management. Two items will be of particular concern, namely the management systems that involve the release of radionuclides which may go beyond national boundaries and the management of wastes that require safe containment for long periods of time.

Co-operation with other organizations

V. 10. 76. This component involves co-operation with WHO and OECD (NEA) in regard to joint sponsorship of symposia, participation in panel meetings and publication of guide-books.

Nuclear energy and environmental pollution

Objective

V. 10. 77. The main objective is to elaborate recommended standards of safety concerning the discharges of radioactive waste into various sectors of the environment. In this connection, the aim is:

(a) The promotion and support of research which will provide information on the behaviour of radionuclides in the environment, including transfer through food chains; and

(b) The evaluation of the potential effects on man and other sensitive organisms in the biological environment of ionizing radiation arising from the increased use of nuclear power and radioisotopes.

Another objective is to encourage the application of nuclear techniques for the improvement of biosphere resources and the management of non-nuclear pollutants of biological origin [V. 10. 1].

Results to date

V. 10. 78. The behaviour of radionuclides released to the marine environment was first reviewed in 1958 and in 1970 a panel prepared a draft report on principles for limiting discharges of radioactive wastes into the sea.

V. 10. 79. The following guide-books have been published:

(a) Monitoring of marine radioactivity (Safety Series No. 11, 1965);

(b) Reference methods for marine radioactivity studies (Technical Report No. 118, 1970);

(c) Disposal of radioactive wastes into fresh water (Safety Series No. 10, 1963, Safety Series No. 36, 1971); and

(d) Radioactive waste disposal into the ground (Safety Series No. 15, 1965).

V. 10. 80. The results of the symposium on Environmental Aspects of Nuclear Power Stations which was held in 1970 were summarized and published for managers and policy-makers with the view to increasing the understanding of nuclear power and its relationship to the environment. A semi-technical booklet on nuclear energy and the environment has also been published.

V. 10. 81. A panel was convened in 1971 which discussed the effects of ionizing radiation on aquatic organisms and ecosystems. A draft report has been prepared.

V. 10. 82. In 1972, a symposium will be held in co-operation with the USAEC, on the interaction of radionuclides with constituents of the marine environment and a panel will be convened to discuss the thermal discharges from nuclear power reactors.

[V. 10. 1] This activity is described in greater detail in the programme component relating to environmental radiation biology (paragraphs V. 5. 120-V. 5. 125 above).

Plans for 1973-74

V. 10. 83. A symposium on the environmental behaviour of radionuclides released in the nuclear industry will be held, giving particular attention to radionuclides such as tritium, krypton and iodine which, because of their environmental mobility or radioactive half-life, may go beyond national boundaries.

V. 10. 84. A panel will be convened to review the question of disposal of radioactive wastes into the sea, in the light of discussions at the United Nations Conference on the Human Environment at Stockholm and the views of other international organizations concerned with marine pollution. The comments which have been requested from Member States on the Agency's report entitled "Principles for Limiting the Introduction of Radioactive Wastes into the Sea" will also be taken into account with a view to the possible publication of this report in the Safety Series.

V. 10. 85. Another panel will examine the question of discharges of non-radioactive pollutants from the nuclear industry, to make recommendations for the management of these wastes and for the control of any such releases to the environment to ensure that the industry maintains the same standards of effective control as it does with releases of radioactivity. Other panel meetings will discuss reference methods for marine radioactivity studies and releases of radionuclides from the routine operation of nuclear power stations and the radiation dose contribution of such releases on both a regional and a global basis.

V. 10. 86. A research co-ordination meeting will be held to review the progress of the co-ordinated research programme established in 1972 for the study of the environmental behaviour of radionuclides released in the nuclear industry.

V. 10. 87. A symposium will be held on thermal discharges from nuclear power stations. The ecological significance of the discharges, with reference to the synergistic interaction of heat and ionizing radiation and alternative uses for the waste heat will be included in the list of items to be discussed.

V. 10. 88. A working group will be convened in 1974 to consider the applications of nuclear techniques for the management of non-nuclear pollutants of the environment and a panel on the use of nuclear techniques in the management of waste of biological origin will be proposed [V. 10. 1].

Related activities

V. 10. 89. The related activities involve some ten research contracts under a co-ordinated programme on the environmental behaviour of radionuclides released from nuclear facilities and three contracts to study the behaviour of radionuclides following disposal of liquid or solid radioactive waste into the ground. Four requests for assistance are expected. A study tour on radiation biology research in environmental studies will be organized [V. 10. 1].

Plans for 1975-78

V. 10. 90. About 10 to 15 research contracts will be awarded each year. A guide-book will be prepared with the assistance of panels, convened for this purpose, to describe the use of ecological systems analysis in assessing potential radiation exposure to man from releases of radionuclides in atomic energy programmes.

V. 10. 91. Increased efforts will be devoted to assessing the environmental impact of nuclear power production and waste management programmes. Information on assessments of regional and global impacts will be disseminated and guidelines for local assessments will be provided. The results will also be made available to Member States in a form that can be easily understood by persons not professionally engaged in such assessments.

V. 10. 92. By 1976 the problem of disposal of radioactive wastes into the marine environment will have been thoroughly reviewed and the programme adjusted accordingly.

V. 10. 93. It is expected that work in the management of non-nuclear pollutants will expand and that emphasis will be placed on those activities that hold out the promise of useful developments in the application of nuclear techniques for the management of freshwater pollutants [V. 10. 1].

Co-operation with other organizations

V. 10. 94. Consultations on the work programme are held with FAO, UNESCO, WHO, WMO and EURATOM.

Decommissioning of nuclear facilities

Objective

V. 10. 95. The objective of this component, to be initiated in 1973, is to review the future needs of the nuclear industry for decommissioning of nuclear facilities and the disposal of the contaminated components.

Plans for 1973-74

V. 10. 96. As the nuclear industry develops, some of the early facilities will become obsolete; they will need to be decommissioned, the components disposed of and the sites prepared for non-restricted use. A consultants' meeting will review the role the Agency should play in providing guidance on this matter.

Plans for 1975-78

V. 10. 97. The activities of the Agency in this respect will depend on the advice obtained from the consultants' meeting.

Co-operation with other organizations

V. 10. 98. Participation in panels is co-ordinated with OECD (NEA).

NUCLEAR SAFETY

OBJECTIVE

V. 10. 99. The objective is to provide Member States with advice on and assistance in the safety aspects of the siting, design, construction and operation of research reactors and nuclear power plants, and of plants storing and processing nuclear materials.

RESULTS TO DATE

V. 10. 100. This sub-programme was initiated in 1960. Thirty-two advisory missions on the safe siting, design and construction of research reactors, nuclear power plants and other nuclear installations, as well as one advisory mission on the acceptance of a nuclear ship for entry into a specific harbour were organized. Two Codes of Practice have been promulgated in co-operation with WHO as part of the Agency's Safety Standards, namely the "Code of Practice for the Safe Operation of Nuclear Power Plants" (Safety Series No. 31) and the "Code of Practice for the Safe Operation of Critical Assemblies and Research Reactors" (Safety Series No. 35).

PLANS FOR 1973-78

V. 10. 101. The work will increase substantially over the next five years, as Member States decide to install nuclear power plants and seek independent advice regarding the safety of the siting, design and construction of these plants. An increased number of requests for advisory missions on reactor safety will be met by the Agency, and training courses on the principles of reactor safety assessment will be held for representatives of atomic energy commissions faced for the first time with the problems involved in nuclear power plant licensing.

RELATED ACTIVITIES

V. 10. 102. Several requests for assistance are expected. Training courses on reactor safety will be organized and siting and safety assessments will be made as requested under the UNDP programme.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 10. 103. This sub-programme involves co-operation with WHO in regard to sponsoring of Codes of Practice and participation in safety missions, and OECD (NEA) with respect to harmonization of programme and meetings (through CREST).

STRUCTURE

V. 10. 104. This sub-programme consists of two components which are described in the following paragraphs.

Siting of nuclear power plants

Objective

V. 10. 105. The objective is to provide Member States with advice on and assistance in the safety aspects of the siting of nuclear power plants.

Results to date

V. 10. 106. This component was initiated in 1963. In eight developing countries sites for nuclear power plants have been selected. On three of the sites nuclear plants are under construction or in operation, and in four cases the possession of the land has been obtained and discussions are taking place with reactor suppliers concerning the delivery of nuclear plants.

Plans for 1973-74

V. 10. 107. Advice will be provided on the suitable choice of sites for nuclear plants and for this purpose special missions on reactor siting will be sent to Member States.

Plans for 1975-78

V. 10. 108. There will be a considerable increase in the work because of the growing number of countries selecting nuclear plants. The authorities responsible for the licensing and other regulatory functions in developing countries will be faced with new problems and will therefore seek advice from the Agency.

Co-operation with other organizations

V. 10. 109. Missions are jointly organized with WHO and liaison with OECD (NEA) is maintained through the group concerned with the licensing and regulatory aspects of nuclear plants.

Safety assessment of nuclear plants, including nuclear merchant ships

Objective

V. 10. 110. The objective is to assist the regulatory authorities in Member States in making safety assessments of their nuclear power plants with a view to obtaining a licensing permit or to have an independent safety review.

Results to date

V. 10. 111. Safety assessments of 12 research reactors have been made and advice provided on the safety levels achieved at the nuclear installations. Four countries have received assistance in making detailed initial and follow-up safety reviews of their nuclear plants. Assistance has been given in the safety assessment of a port for the entry of a nuclear ship, and in this connection a manual entitled "Safety Considerations in the Use of Ports and Approaches by Nuclear Merchant Ships" (Safety Series No. 27) has been published. For guidance on reactor assessments, various reports and codes of practice have been issued which are entitled "Aseismic Design and Testing of Nuclear Facilities" (Technical Report No. 88), "Application of Meteorology to Safety at Nuclear Plants" (Safety Series No. 29), "Safe Operation of Nuclear Power Plants" (Safety Series No. 31), "Guidelines for the Layout and Contents of Safety Reports for Stationary Nuclear Power Plants" (Safety Series No. 34) and "Safe Operation of Critical Assemblies and Research Reactors" (Safety Series No. 35).

Plans for 1973-74

V. 10. 112. Advice will be provided on the safety achieved at nuclear installations in Member States. Special missions for safety assessments will be arranged. In order to explore new developments in regard to nuclear safety, a symposium on principles and standards of reactor safety will be held in 1973.

Related activities

V. 10. 113. The Agency's Safety Standards will be applied to Agency-assisted projects. Training courses and study groups on reactor safety will be held.

Plans for 1975-78

V. 10. 114. Judging by the experience of the last few years, more and more Member States will require safety assessments from the Agency, whereby their own safety committees may be reinforced by other international experts. With the continued interest of the general public in environmental matters, national authorities may want to ask the Agency for independent, impartial advice concerning the safety of their nuclear installations.

Co-operation with other organizations

V. 10. 115. Missions are jointly organized with WHO and liaison with ENEA is maintained through the group concerned with the licensing and regulatory aspects of nuclear plants.

THE USE OF NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES

OBJECTIVE

V. 10. 116. The objective is to study, report and provide information and advice dealing with the uses of PNE, and to study ways and means of establishing an international service for nuclear explosions for peaceful purposes under appropriate international control.

RESULTS TO DATE

V. 10. 117. This sub-programme, which was initiated in 1967, will include activities previously carried out by the Division of Nuclear Power and Reactors. A number of meetings on PNE have been held, which have dealt with the phenomenology, appropriate international observation and practical aspects of contained nuclear explosions. These meetings have reviewed the present status of the technology and have recommended further subjects of interest to Member States which should be taken up by the Agency as part of its role regarding the dissemination of information.

V. 10. 118. A bibliography on PNE and a preliminary edition of a Russian-English glossary of PNE terms have been prepared.

PLANS FOR 1973-74

V. 10. 119. An orientation course on PNE will be planned in which all known efforts and problems involved in the execution of a PNE programme will be comprehensively reviewed.

V. 10. 120. Further meetings on a variety of aspects of PNE are foreseen, possibly including the convening of working groups on specific topics.

RELATED ACTIVITIES

V. 10. 121. Discussions are taking place with a Member State regarding the evaluation of a PNE project.

PLANS FOR 1975-78

V. 10. 122. The Agency's activities in this area will depend upon the development and the availability of the relevant technology.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 10. 123. This sub-programme involves co-operation with WHO on health and safety aspects.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 10. 124. No changes in manpower will be required for 1973 and 1974.

COSTS

V. 10. 125. It is expected that the cost of this programme will increase by $144 000 in 1973, of which $55 300 represents salary and other price increases and $88 700 is to meet the cost of a programme expansion.

V. 10. 126. Increases in the cost of salaries and related common staff costs for established posts will amount to $32 500 and the cost of consultants' services will increase by $1200. Price increases of $2000 for travel and $9100 for scientific meetings and related hospitality are mainly attributable to higher air fares and per diem rates. Funds for scientific and technical contracts will increase by $17 000, of which $9000 will be required to cover price increases. In addition, there will be a slight shift in the provision of funds from research contracts to technical contracts in order to provide for a $6000 increase in respect of the technical contract with ICRP, for which $15 000 will be earmarked.

V. 10. 127. An increase of $3000 is foreseen in respect of scientific supplies and equipment used in providing emergency assistance to Member States in the case of radiation accidents and for the regular radiological work. Since some of the equipment is already obsolete, the above increase is to cover the cost of replacing some items and also price increases of $500. A training film in colour on the safe handling of plutonium is planned for which $3000, which includes $1000 to cover price increases, will be required in addition to the provision for films in 1972.

V. 10. 128. The programme increase of $54 500 for panels and committees, $16 000 for seminars, symposia and conferences and $6700 for travel will make it possible to intensify the Agency's activities in environmental protection and waste management.

V. 10. 129. For 1974 a net increase of $15 000 in the funds required for this programme is expected, and this would entail a reduction in the programme of about $25 000 compared with the 1973 estimate.

11. INTERNATIONAL LABORATORY OF MARINE RADIOACTIVITY

Summary of costs

Table V.11.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	150 807	170 000	17 400	-	17 400	187 400	198 000
Consultants	365	3 000	300	-	300	3 300	3 600
Overtime	-	-	-	-	-	-	-
Temporary assistance	643	-	-	-	-	-	-
Sub-total	151 815	173 000	17 700	-	17 700	190 700	201 600
Common staff costs	55 005	58 600	2 700	-	2 700	61 300	65 300
Travel	2 631	4 400	400	(1 500)	(1 100)	3 300	3 400
Meetings							
Panels and committees	-	-	-	-	-	-	-
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	53	200	-	-	-	200	300
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	17 263	19 500	1 500	-	1 500	21 000	23 000
Common services, supplies and equipment	6 047	6 300	1 700	1 500	3 200	9 500	10 400
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	232 814	262 000	24 000 9.2%	-	24 000 9.2%	286 000	304 000
Source of funds:							
Regular Budget	185 622	217 000	24 000 11.1%	-	24 000 11.1%	241 000	259 000
Operating Fund I	47 192	45 000	-	-	-	45 000	45 000
TOTAL	232 814	262 000	24 000 9.2%	-	24 000 9.2%	286 000	304 000

Summary of manpower

Table V. 11. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	-	-	-	-	-	-
P-5	1	1	1	-	1	1
P-4	3	3	3	-	3	3
P-3	-	-	-	-	-	-
P-2	-	-	-	-	-	-
P-1	2	2	2	-	2	2
Sub-total	6	6	6	-	6	6
GS	12	12	12	-	12	12
M&O	-	-	-	-	-	-
TOTAL	18	18	18	-	18	18

THE PROGRAMME

OBJECTIVE

V. 11. 1. The objective is to promote intercomparison, calibration and standardization of the widely differing methods and techniques being used in national laboratories and institutes for marine radioactivity studies and monitoring programmes with the aim of achieving comparability of results, and to obtain and disseminate scientific information on the fate and effects of radioactivity in the sea.

STRUCTURE

V. 11. 2. This programme consists of three sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

RADIOCHEMISTRY

OBJECTIVE

V. 11. 3. The objective is to ensure the comparability of measurements of the distribution of radionuclides in the marine environment obtained by different national laboratories and national monitoring programmes.

RESULTS TO DATE

V.11.4. This sub-programme was initiated in 1968. With the participation of 44 laboratories in 25 countries, the first intercalibration exercise on two sea-water samples containing mainly fission products was completed in 1971. The results obtained clearly demonstrated the need for the continuation of this sub-programme in order to make it possible to establish a register of releases of radioactive waste into the marine environment.

PLANS FOR 1973-74

V.11.5. In 1973-74 intercalibration exercises on the samples of marine biota and sediments, containing principal fission products and/or activation products, will continue. This work will be extended to some transuranic elements, such as plutonium-239, with special reference to the behaviour of these radionuclides in the marine environment. Technical contracts will be concluded with national laboratories for collection of various intercalibration samples contaminated with radionuclides under natural conditions.

V.11.6. A second panel on Reference Methods for Marine Radioactivity Studies will deal specifically with methods for analysis of ruthenium and plutonium radionuclides.

PLANS FOR 1975-78

V.11.7. In 1975-78 more emphasis will be placed on the elaboration of recommended procedures in monitoring operations and the preparation of standard samples for analytical quality control.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.11.8. This sub-programme involves co-operation with FAO and UNESCO in matters relating to financial support.

RADIOSEDIMENTOLOGY

OBJECTIVE

V.11.9. The objective is to develop comparable methods for measuring the influence of sea-water-sediment systems on the distribution of radionuclides in the marine environment.

RESULTS TO DATE

V.11.10. This sub-programme was initiated in 1965. The preparation of labelled reference sediment samples was successful for fine-grained sediments. It has been proven possible to produce homogeneous natural reference samples, suitable for the future intercalibration programme.

V.11.11. The six-year programme on the behaviour of ten fall-out and waste radionuclides with 59 marine sediments has been completed. Twenty-two national institutions supplied the sediment samples. The results give fundamental background information on the possibilities of sediment reactions with radionuclides under a variety of environmental conditions. Two reviews on the subject of marine geochemistry and sedimentology related to radionuclides were completed.

PLANS FOR 1973-74

V.11.12. Studies will be made on the sorption and desorption capacity of sediments as a function of estuarine and coastal environmental conditions, with special reference to the

relationship of uptake processes by plankton and benthic marine animals in competition with the binding capacity of sediments. An intercalibration programme on measuring the absorption capacities of various marine sediments will be initiated. Reference samples from the Bhabha Atomic Research Centre, Bombay, will be distributed to various national laboratories.

PLANS FOR 1975-78

V.11.13. The work will be concerned with other radionuclides, e.g. the transuranic elements.

RADIOBIOLOGY

OBJECTIVE

V.11.14. The objective is to develop and evaluate methods involving the use of test organisms for intercomparison studies on the fate of radioactive contaminants in marine ecosystems.

STRUCTURE

V.11.15. This sub-programme consists of two components which are described in the following paragraphs.

Radionuclides in water and sediments and some marine organisms

Objective

V.11.16. The objective is to study the availability of different physico-chemical forms of radionuclides in water and sediments to benthic and planktonic marine organisms.

Results to date

V.11.17. This component was initiated in 1966. The physical and chemical states of iron-59, zinc-65, ruthenium-106 and cerium-141 in sea-water were shown to be important factors governing accumulation and subsequent loss of radionuclides from the test organisms in question. The results indicate that radionuclides associated with sediments can be taken up by organisms living in and on the bottom.

Plans for 1973-74

V.11.18. Further evaluation of additional chemical and physical states of zinc-65, iron-59, cobalt-57, manganese-54, cerium-141, ruthenium-106 and zirconium-95-niobium-95 in sea-water and sediments on planktonic and benthic organisms will be carried out.

Plans for 1975-78

V.11.19. The work will be continued with emphasis on obtaining and collecting information on radionuclide cycles in the marine environment in different localities.

Related activities

V.11.20. The related activities involve research contracts and agreements.

Biological transport of contaminants

Objective

V.11.21. The objective is to formulate mathematical models in order to predict biological transport of contaminants in the ocean.

Results to date

V.11.22. This component was initiated in 1970. The first stage of the model to describe the vertical transport of radionuclides by a globally important member of the zooplankton which migrates vertically on a diurnal time scale has been completed.

Plans for 1973-74

V.11.23. The model will be tested and extended to other planktonic species of world-wide distribution.

Plans for 1975-78

V.11.24. Increased emphasis will be placed on detailed models for predicting the partition of contaminants among the various components of marine systems.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.11.25. No changes in manpower are foreseen for 1973 and 1974.

COSTS

V.11.26. The cost of the Monaco Laboratory programme will increase by $24 000 in 1973. This increase is entirely attributable to salary and other price increases.

V.11.27. The increase in respect of salaries and related common staff costs amounts to $20 100 and the increase for consultants' services to $300. The amount provided for travel is reduced by $1100 in the light of actual requirements in the past. The increase for scientific supplies and equipment is $1500. The increase of $3200 for common services, supplies and equipment consists of price increases of $1700 and a programme increase of $1500 as a result of the relatively low estimates for 1972.

V.11.28. The total increase of $24 000 will have to be financed from the Regular Budget, since the contribution expected from the Monegasque Government, which is used to finance expenditure under Operating Fund I, will remain at $45 000.

V.11.29. For 1974 it is expected that the amount required to cover salary and other price increases will be $18 000 more than in 1973.

12. INFORMATION AND TECHNICAL SERVICES

Summary of costs

Table V. 12. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	504 614	612 000	65 800	(12 000)	53 800	665 800	711 500
Consultants	4 037	9 000	500	(1 000)	(500)	8 500	8 500
Overtime	2 735	1 600	100	-	100	1 700	1 700
Temporary assistance	2 837	1 800	200	9 000	9 200	11 000	11 400
Sub-total	514 223	624 400	66 600	(4 000)	62 600	687 000	733 100
Common staff costs	187 178	211 200	8 500	(1 700)	6 800	218 000	234 900
Travel	7 396	21 400	1 800	(5 200)	(3 400)	18 000	18 000
Meetings							
Panels and committees	19 701	22 000	2 000	(8 000)	(6 000)	16 000	16 000
Seminars, symposia and conferences	7 639	7 000	1 000	-	1 000	8 000	9 000
Representation and hospitality	802	1 000	-	-	-	1 000	1 000
Scientific and technical contracts	46 190	66 000	2 000	(22 000)	(20 000)	46 000	46 000
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	400 368	539 000	46 000	13 000	59 000	598 000	650 000
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	1 183 497	1 492 000	127 900 8.6%	(27 900) (1.9%)	100 000 6.7%	1 592 000	1 708 000

Summary of manpower

Table V. 12. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	1	1	1	-	1	1
P-5	3	3	2	-	2	2
P-4	7	7	8	-	8	8
P-3	8	8	7	-	7	7
P-2	5	5	6	1	7	7
P-1	8	8	8	(1)	7	7
Sub-total	32	32	32	-	32	32
GS	47	49	49	-	49	51
M&O	-	-	-	-	-	-
TOTAL	79	81	81	-	81	83

THE PROGRAMME

OBJECTIVE

V.12.1. The objective is to facilitate the exchange of information on the peaceful uses of atomic energy and to collect, assemble and disseminate such information to scientific bodies in Member States, the international organizations concerned and the Agency's staff.

RESULTS TO DATE

V.12.2. INIS, which was established in 1966, has been in operation since 1970. Computer and library services have been provided.

PLANS FOR 1973-74

V.12.3. INIS will operate with the full subject scope. Computer services will be expanded, especially for safeguards work. The Library's reference service will be improved.

PLANS FOR 1975-78

V.12.4. The operation of INIS will continue. The library and computer services will prepare for joint operations with UNIDO in the International Centre in Vienna, to be built at Donaupark.

RELATED ACTIVITIES

V.12.5. The related activities consist of the planning of a regional centre and the holding of training seminars for INIS.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.12.6. The programme involves co-operation with UNESCO, UNIDO, UNDP and WIPO.

STRUCTURE

V.12.7. This programme consists of three sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

INIS

OBJECTIVE

V.12.8. The objective is to produce a comprehensive, world-wide collection of nuclear information through the use of computers so that modern standards of speed and production can be achieved, a special effort being deployed to make available to developing countries quickly and cheaply the nuclear information they need.

RESULTS TO DATE

V.12.9. The limited subject scope and full subject scope of INIS have been determined. INIS has been operating in a satisfactory manner with the limited subject scope since 1970. Forty Member States and eleven international organizations are now participating in it.

The Advisory Committee for INIS, which met in 1971, recommended that it should start operating with the full subject scope as early as possible in 1972, and this recommendation was accepted by the Board in March 1972. Over the last six months of 1971 there was an average of 1000 output products per month; with full-scope operation, the monthly average should amount to 7000 items.

PLANS FOR 1973-74

V. 12. 10. The main effort will be directed towards operating INIS with the full subject scope. It is expected that, with the wide range of subjects covered, the selective dissemination of information and retrospective search systems will be developed. All computer programmes and the related documentation, as well as other information on the use of INIS output products, will be made available to Member States.

PLANS FOR 1975-78

V. 12. 11. The Board has requested the Director General to provide it during 1975 with a comprehensive report on the operation of INIS in the years 1972-74. If, in the light of that report, INIS continues to operate with the full subject scope, emphasis will be placed on improving its operation. A seminar for the training of indexers will be held each year if the need arises. It will be necessary to carry out cost-benefit studies, possibly under contractual arrangements, in relation to certain matters, such as automatic indexing, remote-console tele-processing, the use of high-speed printouts, the installation of an optical reader to exclude keypunching of input, automatic translation of abstracts, and the development of the service for the retrieval of information for developing countries.

RELATED ACTIVITIES

V. 12. 12. The related activities consist of the holding of one training seminar each year in Vienna, the provision of advisory services, on-the-job training activities, and the planning of a regional centre in India in co-operation with UNESCO and UNDP.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 12. 13. This sub-programme involves the co-ordination with UNESCO of work relating to a world science information system (UNISIST) and training activities. It also involves co-operation with WIPO in dealing with the literature concerning patents, and with UNDP in regard to technical assistance.

COMPUTER SERVICES

OBJECTIVE

V. 12. 14. The objective is to provide computer services for the Secretariat and UNIDO in order to facilitate the performance of technical and administrative work.

RESULTS TO DATE

V. 12. 15. The provision of the computer services started in 1967. The IBM 1401 computer used in 1967 was replaced by a larger IBM 360/30 model in 1969, and an even larger IBM 370/145 model is scheduled for delivery in July 1972. The cost of the computer service per unit of work has decreased since 1969. The total costs of the Computer Section were 20% higher in 1971 than in 1969, while the amount of computer hours used increased by 230% over that period. The computer has enabled work to be done that would not have been done without it and it has speeded up the provision of information.

V. 12. 16. The computer programmes now in production include the following:

(a) For the Agency:

Research and isotopes: Nuclear data system, scintigraphy, dosimetry;

Safeguards and inspection: Safeguards accounting and modelling;

Technical assistance and publications: Mailing labels for publications, fellowship records;

Technical operations: INIS programming support, library programme;

Administration: Accounting system, payroll, health insurance claims, personnel systems.

(b) For UNIDO:

Payroll, staff reporting, experts' roster, library index, management information system for project implementation.

PLANS FOR 1973-74

V. 12. 17. The Computer Section will continue to provide computer services for the Agency and UNIDO. Consideration will be given, based upon a cost-benefit study, to the installation of a tele-processing terminal in co-operation with UNIDO. More time will have to be devoted to the production of INIS output. It is expected that output relating to the Agency's and UNIDO's administrative systems, as now defined, will be in full production and that the production processing of safeguards data will increase significantly. It is also expected that the IBM 370/145 computer will operate with two full shifts per day. Efforts will continue to be made to ascertain whether computer programmes made available through other agencies can be utilized effectively by the Agency and UNIDO.

PLANS FOR 1975-78

V. 12. 18. It is expected that the computer workload will continue to expand, both for the Agency and UNIDO. The IBM 370/145 computer will probably need an increased storage capacity and its operation may be increased to three full shifts per day. If the cost of linking computers in different locations decreases during this period, careful consideration will be given to obtaining additional services, if necessary from the International Computing Centre in Geneva. It is conceivable that tele-processing will become useful in several Agency and UNIDO operations. During this period the Agency and UNIDO will move to the International Centre and the computer services will be fully consolidated; this consolidation will require extensive planning and co-ordination between the Agency and UNIDO.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 12. 19. As stated above, computer services are provided for UNIDO. The feasibility of co-operation with the United Nations Inter-Organizational Board and International Computing Centre in Geneva is being studied.

LIBRARY SERVICES

OBJECTIVE

V. 12. 20. The objective is to supply the Secretariat and Member States with information on nuclear energy. For this purpose, monographs, journals, reports and other material dealing with nuclear energy and related subjects are collected and catalogued.

RESULTS TO DATE

V. 12. 21. Some of the Library's work, such as that relating to the conference file, office book circulation and automatic journal circulation, has been mechanized, and work on the book acquisition data file, serial acquisitions and holdings will be mechanized by mid-1972. Automation has facilitated the publication of the IAEA Library Catalogue of Books, the Conference Proceedings in the IAEA Library and the IAEA Library Serial Titles. It has also become possible to provide increased library services although the number of staff members has been reduced from 19 to 17. Tables V. 12. 3 and V. 12. 4 below give the relevant figures.

Table V. 12. 3

Library services

	1967	1971
Book and periodical loans		
To Member States	1 771	468
From Member States	1 066	1 394
Circulation within the Secretariat		
Books, periodicals, documents	44 064	53 550
Pages photocopied	139 186	85 672
Film loans to Member States	505	821

Table V. 12. 4

Library holdings

	1967	1971
Books and bound periodicals	27 908	35 791
Serial titles	1 100	1 386
Technical reports	100 988	149 761
Films	420	498

PLANS FOR 1973-74

V. 12. 22. The automation of the appropriate services will have been completed and, in 1973-74, efforts will be made to improve the reference service. With the completed library data file, the selective dissemination of information will be possible. Tele-processing will be carefully examined and evaluated on a cost-benefit basis. Three Library publications, the IAEA Library Catalogue of Books, the Conference Proceedings in the IAEA Library and the IAEA Serial Titles, will be made sales publications after the inclusion of additional bibliographical material.

PLANS FOR 1975-78

V. 12. 23. If it is found that tele-processing is feasible and economic, it should be possible for the Agency's staff at Headquarters and at the Laboratory at Seibersdorf to have direct access to the Library's holdings. Detailed planning of the joint UNIDO-IAEA Library will be essential during this period to facilitate the move to the International Centre and to take full advantage of the economies which would result from a joint service; jointly employed consultants may be required for this purpose.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 12. 24. This sub-programme involves co-operation with UNIDO in the book acquisition computer project and in the production of the serials list.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 12. 25. In the revised manning table for 1972 two Professional posts, one at the P-5 and one at the P-3 level, were transferred to other programmes in exchange for two posts at the P-4 and P-2 level respectively. For 1973 the upgrading of an existing P-1 post to the P-2 level is foreseen. These manning table changes resulted from the survey of the utilization and deployment of staff carried out during 1971.

V. 12. 26. No additional posts are foreseen for 1973.

V. 12. 27. For 1974, two additional GS posts are foreseen for the INIS Section, one for clerical work in the subject control unit and one for work in the bibliographical control unit.

COSTS

V. 12. 28. The total cost of this programme is expected to increase by $100 000 in 1973 as a net result of salary and other price increases of $127 900, partly offset by a programme reduction of $27 900. On the other hand income under the IAEA/UNIDO common services agreement is expected to increase by $ 30 000 and income from INIS publications by $35 000 as compared with the 1972 revised budget.

V. 12. 29. The increase in respect of higher salaries, temporary assistance, consultants and overtime rates and related common staff costs will amount to $75 100 for the whole programme. The programme reduction of $14 700 in respect of salaries and common staff costs and consultants is partly attributable to the transferring of posts between the Library and other programmes which has been partly reflected in the revised manning table, but not in the revised budget estimates for 1972; the reduction is also attributable to some additional delay in filling posts in the Computer Section and to a slight decrease in consultants' funds. In part this reduction is offset by a programme increase of $9000 for temporary assistance, mainly to provide for such assistance under the INIS programme, for which additional GS staff will be provided only in 1974.

V. 12. 30. A net reduction in the estimates for travel and meetings in the amount of $8400, mainly in the INIS programme, will, owing to the increases in air fares and per diem rates, result in a programme reduction of $13 200 for these items. Funds required for INIS contractual services are expected to decrease by $20 000.

V. 12. 31. The cost of common services, supplies and equipment will increase by $59 000 for the whole programme, of which $46 000 represents price increases for INIS, computer and library services and $13 000 a programme increase. The cost in respect of computer

rental, electronic data processing supplies and the purchase of equipment will increase by $40 500, of which $26 500 represents price increases that are exclusively the result of currency revaluations, and $14 000 constitutes a programme increase. This will be almost offset by the expected increase of $ 30 000 in income from UNIDO.

V.12.32. INIS will have operated with the full subject scope for some time by 1973 and it can therefore be assumed that the income from INIS publications, ATOMINDEX and microfiches, will increase by $35 000 over the 1972 estimate, which is more than the expected increase in the cost of the INIS operation.

V.12.33. Funds for library acquisitions and services are increased by $3000, which is not quite sufficient to cover price increases. No change is foreseen in the cost of the Nuclear Fusion Journal and the Atomic Energy Review, which are included in the cost of the Director's office.

V.12.34. For 1974 the cost of this programme is expected to increase by $116 000, of which $89 000 represents estimated salary and other price increases and $27 000 the cost of a programme expansion, mainly in respect of additional clerical staff for the INIS service and additional computer costs. The latter should be offset by additional income under the IAEA/UNIDO common services arrangement.

Summary of total costs by organization unit

Table V.12.5

Organization unit	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Office of the Director	62 466	80 000	5 800	(2 400)	3 400	83 400	86 000
INIS Section	449 098	569 300	47 700	(21 600)	26 100	595 400	628 000
Computer Section	460 903	606 800	48 400	5 200	53 600	660 400	722 000
Library	211 030	235 900	26 000	(9 100)	16 900	252 800	272 000
TOTAL	1 183 497	1 492 000	127 900 8.6%	(27 900) (1.9%)	100 000 6 7%	1 592 000	1 708 000

Summary of manpower by organization unit and category

Table V.12.6

Organization unit	1971 Revised budget				1972 Revised budget				1973 Estimate				1974 Preliminary estimate			
	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total
Office of the Director	2	2	-	4	2	2	-	4	2	2	-	4	2	2	-	4
INIS Section	15	16	-	31	15	17	-	32	15	17	-	32	15	19	-	34
Computer Section	10	17	-	27	10	18	-	28	10	18	-	28	10	18	-	28
Library	5	12	-	17	5	12	-	17	5	12	-	17	5	12	-	17
TOTAL	32	47	-	79	32	49	-	81	32	49	-	81	32	51	-	83

Cost of INIS activities

Table V. 12. 7

Item of expenditure	1971 Actual obligations	1972 Revised budget	1973 Estimate	1974 Preliminary estimate
Salaries and wages				
Established posts	228 708	273 000	298 000	321 500
Consultants	4 037	8 000	8 000	8 000
Overtime	24	500	500	500
Temporary assistance	776	600	9 000	9 100
Sub-total	233 545	282 100	315 500	339 100
Common staff costs	85 324	94 000	97 600	106 100
Travel	4 129	10 400	9 000	9 000
Meetings				
Panels and committees	19 701	22 000	16 000	16 000
Seminars, symposia and conferences	7 639	7 000	8 000	9 000
Representation and hospitality	802	800	800	800
Scientific and technical contracts	33 303	50 000	30 000	30 000
Common services, supplies and equipment	64 655	103 000	118 500	118 000
TOTAL	449 098	569 300	595 400	628 000
			4. 6%	5. 5%

13. SAFEGUARDS

Summary of costs

Table V. 13. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	826 161	1 332 000	121 000	(86 000)	35 000	1 367 000	1 752 000
Consultants	4 407	10 000	1 000	(1 000)	-	10 000	10 000
Overtime	126	300	-	-	-	300	300
Temporary assistance	-	1 400	200	(200)	-	1 400	1 400
Sub-total	830 694	1 343 700	122 200	(87 200)	35 000	1 378 700	1 763 700
Common staff costs	305 600	460 000	27 600	(39 300)	(11 700)	448 300	578 800
Travel	164 123	240 000	20 000	(20 000)	-	240 000	240 000
Meetings							
Panels and committees	20 854	38 000	4 000	12 000	16 000	54 000	55 000
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	4 119	4 300	200	500	700	5 000	5 500
Scientific and technical contracts	86 375	200 000	8 000	(48 000)	(40 000)	160 000	170 000
Scientific supplies and equipment	176 725	120 000	12 000	60 000	72 000	192 000	197 000
Common services, supplies and equipment	12 002	-	-	-	-	-	-
Other items of expenditure	35 931	50 000	-	70 000	70 000	120 000	250 000
TOTAL	1 636 423	2 456 000	194 000 7.9%	(52 000) (2.1%)	142 000 5.8%	2 598 000	3 260 000

Summary of manpower

Table V. 13. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
IG	1	1	1	-	1	1
D	2	2	2	-	2	2
P-5	17	20	20	(2)	18	19
P-4	19	28	28	-	28	31
P-3	21	26	26	-	26	33
P-2	11	14	14	(2)	12	21
P-1	2	2	2	(2)	-	-
Sub-total	73	93	93	(6)	87	107
GS	30	33	33	-	33	36
M&O	-	-	-	-	-	-
TOTAL	103	126	126	(6)	120	143

THE PROGRAMME

OBJECTIVE

V. 13. 1. The objective is to supervise and co-ordinate the development and the application of Agency safeguards and to lay down safeguards policy. The Office of the Inspector General is responsible for the overall direction of the Division of Operations, the Division of Development and the Section for Standardization and Administrative Support in the Department of Safeguards and Inspection.

STRUCTURE

V. 13. 2. This programme consists of three sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

SAFEGUARDS OPERATIONS

OBJECTIVE

V. 13. 3. The objective is to apply safeguards designed to ensure that special fissionable and other materials made available by the Agency or at its request in accordance with project agreements, or under its supervision or control in accordance with unilateral submission and transfer agreements, are not used in such a way as to further any military purpose, and to apply safeguards in connection with NPT with a view to the timely detection of diversion of significant quantities of nuclear material from peaceful uses to nuclear weapons or other nuclear explosive devices, and the deterrence of such diversion by the risk of early detection.

RESULTS TO DATE

V. 13. 4. This sub-programme was initiated in 1959 when the first project agreements were concluded. The first transfer and unilateral submission agreements were concluded in 1962, and the first agreements in connection with NPT in 1971.

V. 13. 5. The number of safeguards agreements concluded with the Agency has steadily increased over the years. In 1972 safeguards are being applied with respect to 16 project agreements, 28 transfer agreements, 3 unilateral submission agreements and 20 agreements in connection with NPT. They cover nuclear material in 84 research reactors, 25 nuclear power stations and 133 other facilities at locations in 41 States. No departures from the terms of the respective safeguards agreements have come to light.

PLANS FOR 1973-74

V. 13. 6. In 1973, safeguards will be applied, under existing agreements, in 21 States and in connection with NPT in 20 States having significant amounts of nuclear materials. The entry into force of an agreement with EURATOM and Member States of EURATOM could result in an increase of the work load during 1974, and a further increase may also arise consequent upon the submission to safeguards of activities in the United States and the United Kingdom.

RELATED ACTIVITIES

V. 13. 7. The Laboratory will service instruments and analyse samples. Health physics services will be provided by the Division of Nuclear Safety and Environmental Protection.

PLANS FOR 1975-78

V. 13. 8. The majority of safeguards agreements in connection with NPT will have been concluded and the relevant safeguards will be implemented. The establishment of regional offices will be considered.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 13. 9. This sub-programme involves continuous co-operation with national and regional nuclear energy authorities in order to make the fullest possible use of national or regional systems of accounting for and control of nuclear material.

STRUCTURE

V. 13. 10. This sub-programme consists of two components which are described in the following paragraphs.

Implementation of safeguards agreements

Objective

V. 13. 11. The objective is to procure, in accordance with agreements and related subsidiary arrangements, information on the flow and inventory of nuclear material by compiling and evaluating reports and performing inspections with a view to reaching the required technical conclusions.

Results to date

V. 13. 12. Over 1000 inspections have been performed, as well as related activities, such as the maintenance and calibration of instruments, the making of arrangements for the analysis of duplicate samples and the validation of statistical methods. Safeguards practices have been elaborated for the main types of facilities.

Plans for 1973-74

V. 13. 13. Altogether 253 nuclear facilities and other locations, including 82 research reactors, 30 nuclear power stations, 14 fuel conversion and fabrication plants, 2 reprocessing plants and 46 other facilities will have to be inspected in 1973. The table below gives the types of facilities, and the number of each type, which will be under safeguards in 1973, and for comparison purposes, the type and number of each type under safeguards in 1971 and 1972.

Table V. 13. 3

Facilities under safeguards

1971-1973

Type of facility	1971	1972		1973		1973 Total
		Transfer and project agreements	NPT agreements	Transfer and project agreements	NPT agreements	
Power plants	11	18	7	21	9	30
Conversion plants	-	2	1	2	1	3
Fuel fabrication plants	6	9	3	8	3	11
Reprocessing plants	-	2	-	2	-	2
Pilot fuel fabrication plants	3	1	1	4	2	6
Pilot reprocessing plants	2	2	2	2	1	3
Research reactors	57	50	34	47	35	82
Critical facilities	11	12	4	11	5	16
Subcritical facilities	3	-	3	-	3	3
Research and development facilities	16	16	-	16	2	18
Other locations	67	64	11	69	10	79
TOTALS	176	176	66	182	71	253

V. 13. 14. During the second part of the two-year period, the entry into force of an agreement with EURATOM and Member States of EURATOM would require the safeguarding of nuclear material in well over 100 additional facilities. The number of facilities to be inspected would further increase as a result of the expansion of nuclear activities in many States and the conclusion of safeguards agreements in respect of activities in the United Kingdom and the United States.

V. 13. 15. The resulting inspection work load would be allocated to regional sections, with the States grouped in such a way as to ensure that the most economic arrangements can be made in respect of travel. In between inspections, reports will be prepared at Headquarters and evaluated, for comparative purposes, with incoming reports on nuclear materials, subsidiary arrangements for new agreements will be worked out, statements on the result of inspections and on the conclusions drawn from the Agency's verification activities will be prepared, and inspection practices for individual facilities will continue to be set out in manuals.

Related activities

V. 13. 16. The Laboratory will service and calibrate portable measuring instruments. In addition, samples will have to be analysed; this will be done partly in the Laboratory and partly on a contractual basis in Member States. Health physics services will be provided by the Division of Nuclear Safety and Environmental Protection.

Plans for 1975-78

V. 13. 17. The expected growth in nuclear activities in the Americas, the Far East and Central and Northern Europe, excluding the United Kingdom and the United States, is expected to be of the order of two to three; in the south and south-east areas of the world, the rate of growth will probably be considerably less.

V. 13. 18. With the establishment of regional offices in areas where the work load justifies such a step and when the concurrence of the Member State involved is obtained, it may be necessary to make some organizational readjustments. Further standardization of safeguards implementation will be accomplished, together with an increase in the efficiency of inspectors, by gradually introducing more instrumentation and automation and by the correlation of results at different measuring points in the fuel cycle.

Accounts and reports

Objective

V. 13. 19. The objective is to operate the central nuclear material accounting and information system, to review and standardize operational practices, and to provide for the training of inspectors.

Results to date

V. 13. 20. This component was initiated in 1968. A central record of safeguarded material has been established. A computer programme for the processing, storage and retrieval of safeguards information has been drawn up. Sixty-nine safeguards inspectors have been trained.

Plans for 1973-74

V. 13. 21. Activities will include the extension and adaptation of the computer programme for the processing of safeguards information, the preparation of statements on the technical conclusions of verification activities, the comparison of book inventories with national and regional nuclear material accounting systems, and continuing standardization of operational practices. A training manual will be prepared for new Agency inspectors, as well as for safeguards personnel in Member States.

Plans for 1975-78

V. 13. 22. The operation of the data processing system will be continued and, if necessary, will be adapted for the use of regional offices. Suitable programmes will be prepared to provide training for up to 30 inspectors per year, including Agency staff and safeguards personnel in Member States, as requested.

SAFEGUARDS DEVELOPMENT

OBJECTIVE

V. 13. 23. The objective is to enable the Agency's safeguards system to achieve the safeguards objectives under the optimum economic conditions for the Agency, the States and the operators.

RESULTS TO DATE

V. 13. 24. This sub-programme was initiated in 1969. Technical support was provided for the preparation of the model NPT agreement and for the review and standardization of the preparation of subsidiary arrangements and of attachments for specific types of facilities. Design information requirements were set forth in an internal report. Detailed accountancy report requirements have been worked out for inclusion in subsidiary arrangements.

V. 13. 25. Estimates have been made of the actual inspection effort for each facility. Forecasts of manpower requirements and staff costs have been made.

V. 13. 26. Instruments have been selected and technical specifications for procurement and instructions for use in inspections have been drawn up.

PLANS FOR 1973-74

V. 13. 27. The work will include the forecasting of the characteristics and size of nuclear material cycles in Member States and of the resulting safeguards task. It also will include optimization by testing, review and further elaboration of the requirements, the use of

information provided by Member States for safeguards purposes, the establishment of criteria for data verification and evaluation, the determination of the procedures, techniques and instrumentation to be used, and the provision of assistance to States in setting up national systems of accountancy and control that will be co-ordinated with the Agency's safeguards system.

V. 13. 28. The formulation of procedures for implementing safeguards for all types of facilities including enrichment installations will be completed. A network of analytical laboratories and a related quality control programme will be established. The network will consist of national laboratories working under contract with the Agency and a central safeguards analytical laboratory operated by Agency staff. Equipment will need to be provided for the latter laboratory in 1973 and 1974.

V. 13. 29. Six working groups or panels per year are foreseen.

V. 13. 30. In the period 1973-74, a yearly publication entitled "Review of development progress", as well as a Safeguards Technical Manual and Guidelines for National Systems of Accountancy for and Control of Nuclear Material will be issued.

PLANS FOR 1975-78

V. 13. 31. The character of the work will shift from conceptual studies to continuous review, optimization and technical support of operations. Safeguards implementation through regional offices would result in only a slight increase in work in relation to the review and optimization of safeguards procedures. In 1975 further equipment will need to be provided for the safeguards analytical laboratory, which will become operational in that year.

RELATED ACTIVITIES

V. 13. 32. The related activities involve some 15 research and technical service contracts per year. The Laboratory will maintain and calibrate equipment and provide analytical services.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 13. 33. This sub-programme involves co-operation with EURATOM and OECD (NEA) in regard to meetings and research contracts and agreements.

STRUCTURE

V. 13. 34. This sub-programme consists of three components which are described in the following paragraphs.

Systems studies

Objective

V. 13. 35. The objective is to provide an updated description of the nuclear material systems in Member States, to determine the quantitative specification of the results of safeguards application, to define the requirements, to determine the processing mode and use of information provided by Member States and obtained through inspections, and to provide the guidelines for the optimization of the safeguards effort and of the use of equipment.

Results to date

V. 13. 36. Support was provided for the drafting of the model NPT agreement and two working groups were convened; the results of this work were incorporated in the booklet entitled "The Structure and Content of Agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons" [V. 13. 1].

[V. 13. 1] INFCIRC/153.

An internal report entitled "Information Requirements for IAEA Safeguards", which was issued in April 1971, was reviewed with some Member States and led to a standardization of report requirements which has been reflected in the drafting of subsidiary arrangements.

V. 13. 37. Internal reports have been issued dealing with the updating of the analysis of the distribution of nuclear material in non-nuclear-weapon States and the associated safeguards staff and cost requirements for the years 1970-1980, comparative cost studies in respect of Headquarters and regional offices and studies on safeguards in enrichment plants.

Plans for 1973-74

V. 13. 38. The activities for this period will include:

(a) The yearly updating of the quantitative description of world-wide nuclear material cycles throughout the world, in co-operation with the Division of Nuclear Power and Reactors;

(b) The quantification of results to be achieved by the application of safeguards criteria and evaluation schemes;

(c) The completion of the conceptual studies for the establishment of the network of analytical laboratories and of the related quality control programme, and a continuous review of the programme;

(d) The finalization of the design of information systems based on experience gained during inspections;

(e) The study of manpower requirements for specific types of inspection by analysing the results of test and actual operations;

(f) The review of the effectiveness of new methods and techniques;

(g) The yearly updating of medium- and long-term inspection manpower and cost forecasts, taking into account optimized allocation schemes and the growth of nuclear material cycles;

(h) The provision of assistance with the standardization of subsidiary arrangements and the implementation of a computerized information system;

(i) The organization of technical working group meetings to review the progress in safeguards systems analysis, the information system and information requirements and the allocation of the inspection effort, and to discuss the actual limits of accuracy for nuclear material measurements.

Plans for 1975-78

V. 13. 39. The need for conceptual and systems design studies will be reduced and such studies will gradually be replaced by operations review and optimization studies.

Related activities

V. 13. 40. The related activities involve one or two research contracts and agreements per year.

Co-operation with other organizations

V. 13. 41. This component involves co-operation with EURATOM in regard to technical meetings.

Methods and techniques

Objective

V.13.42. The objective is to develop and optimize:

(a) Methods, techniques and instrumentation for the determination of nuclear material content;

(b) Techniques for ensuring representative sampling, identification and surveillance of the flow of nuclear material; and

(c) Automation of instruments to provide instantaneous and continuous information on nuclear material content, nuclear material identification and surveillance of flow.

Results to date

V.13.43. The following non-destructive measurement techniques involving the use of portable instruments and analytical methods, have been successfully tested:

(a) X-ray fluorescence measurement of low enriched uranium dioxide;

(b) Measurement, by means of neutron coincidence counters, of the isotopic composition of plutonium in mixed oxide fuel pins;

(c) Measurement, by means of advanced neutron coincidence counters, of small quantities of plutonium in fuel pins; and

(d) Determination of the composition of low enriched uranium oxide powders by means of NaI(Tl) detectors.

V.13.44. Progress has been made in the development of methods for:

(a) Volume measurements at reprocessing plants;

(b) Indicating completeness of flow;

(c) Chromatographic separation of uranium and plutonium for analysis;

(d) Obtaining representative samples from large tanks; and

(e) Identifying nuclear materials and items.

V.13.45. Progress has also been made in the development of instruments for in-line determination of uranium, coulometric analysis of uranium in the field, and flow surveillance.

V.13.46. In addition, the basic requirements of the Agency's safeguards analytical laboratory have been defined.

Plans for 1973-74

V.13.47. Activities during this period will include:

(a) Co-operation with the Agency's Laboratory in the selection of facilities and equipment to meet safeguards analytical requirements and in the co-ordination of the start-up of the programme for uranium isotopic analysis and uranium and plutonium concentration determination;

(b) Establishment of handling procedures for samples of plutonium nitrate and mixed oxides;

(c) Design of portable instruments with detectors requiring only intermittent cooling, and selection of instruments for a possible mobile non-destructive testing laboratory;

(d) Tests for representative sampling in large vessels;

(e) Evaluation and testing of new sealing techniques;

(f) Installation of prototypes of flow surveillance instruments;

(g) Development of automatic and continuous flow information collection procedures; and

(h) Establishment of specifications for field inspection instruments and the co-ordination of their selection, maintenance and calibration.

V.13.48. Three technical working group meetings and research co-ordination meetings will be held in 1973-74.

Plans for 1975-78

V.13.49. The work will consist of the following activities:

(a) The demonstration of fully automated instrumentation with tamper-indicating features for measurement, identification and surveillance of special nuclear material;

(b) The development of methods, techniques and instrumentation to facilitate safeguarding of enrichment facilities and to take into account problems arising from new enrichment technologies;

(c) The development of specific instrumental techniques to be applied in a mobile laboratory;

(d) The definition of the usefulness and limitations of portable instrumentation at selected key measurement points in the fuel cycle; and

(e) The development of techniques for surveillance of containment in each type of principal nuclear facility (including product stores).

Related activities

V.13.50. The related activities involve about ten research contracts per year. The Laboratory will maintain and calibrate equipment.

Co-operation with other organizations

V.13.51. This component involves co-operation with EURATOM and OECD (NEA) in respect of research contracts and agreements.

Field operations

Objective

V.13.52. The objective is to establish international standards for nuclear material measurements and to develop, demonstrate and review safeguards procedures.

Results to date

V. 13. 53. An experiment in a Magnox-type power reactor station has shown the feasibility of the containment approach for a piece-count inventory without item identification.

V. 13. 54. An experiment in a plutonium fast critical facility provided the basis for the establishment of a sampling plan for physical inventory verification by means of non-destructive techniques.

V. 13. 55. An experiment in a low enriched uranium conversion and fuel fabrication plant has demonstrated verification procedures and the technical rationale for statistical sampling.

V. 13. 56. Safeguards procedures for pilot plants fabricating mixed oxide fuels have been formulated.

V. 13. 57. The feasibility of power reactor fuel identification by gamma scanning and the Agency's plutonium determination capabilities have been demonstrated by an experiment at an irradiated fuel processing plant.

Plans for 1973-74

V. 13. 58. The work will consist of the collection of data related to levels of accountability and the evaluation of material unaccounted for in facilities in which flow is more important than inventory, such as plutonium/uranium mixed oxide and enriched uranium conversion and fuel fabrication facilities and reprocessing and enrichment plants. To ensure that those data will be intercomparable, criteria for the collection and evaluation of field data for use in the Agency's safeguards system will be established.

V. 13. 59. A demonstration test in connection with the international network of safeguards analytical laboratories will be performed in 1974.

V. 13. 60. The development and review of safeguards procedures and the demonstration of new safeguards techniques in field experiments will be continued.

V. 13. 61. It is planned to hold a field experimentation co-ordination meeting in 1973 for a limited number of national project leaders.

V. 13. 62. Two working groups will be convened in 1974 to evaluate the results obtained in the field operations.

V. 13. 63. The guidelines for the physical protection of nuclear material which have been established by selected specialists will be made available to States on request.

Related activities

V. 13. 64. The related activities involve two to four research contracts and agreements per year. The Laboratory will provide analytical services in support of the field experimentation programme.

Plans for 1975-78

V. 13. 65. The activities will include:

(a) The demonstration and consolidation of developed safeguards procedures for plutonium, highly enriched uranium and uranium isotopic enrichment facilities;

(b) The review of the effectiveness and efficiency of existing safeguards procedures in operational use;

(c) A possible expansion of the mobile laboratory facility;

(d) Further development and testing of non-destructive measurement techniques; and

(e) The development of safeguards procedures for new production methods, more particularly in reprocessing plants.

Co-operation with other organizations

V. 13. 66. This component involves co-operation with EURATOM and OECD (NEA) in regard to technical meetings.

STANDARDIZATION

OBJECTIVE

V. 13. 67. The objective of this sub-programme is to ensure the efficacy and uniformity of arrangements with national authorities for the application of safeguards agreements, and to codify safeguards procedures.

RESULTS TO DATE

V. 13. 68. The issuing of an internal safeguards manual was initiated in 1967, and the preparation of model subsidiary arrangements, including attachments for specific types of facilities, was initiated in 1970.

PLANS FOR 1973-74

V. 13. 69. The standardization and editing of subsidiary arrangements will be continued. The safeguards manual will be updated and revised. Proposals will be worked out for the establishment of regional offices.

PLANS FOR 1975-78

V. 13. 70. Attachments for all types of facilities will be completed and will be revised as required. Further arrangements will be considered for the establishment of regional offices and, in the event of their establishment, arrangements will be made for the exchange of information between them and Headquarters.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 13. 71. The first full year of implementing safeguards in connection with NPT will be 1973 and the inspection work load will increase by about one third as compared with 1972. This increase, together with the increase in respect of facilities covered by project and transfer agreements, can be handled by the inspectors recruited towards the end of 1972 for training, which will bring the total number of inspectors to 45.

V. 13. 72. Fifteeen additional inspectors or a total of 60 will be required towards the end of 1973, which is six less than the number of posts authorized for 1972. These 15 inspectors will be recruited only for the last three months of the year.

V. 13. 73. Present estimates indicate that in 1974 there will be a need for a further increase of 20 inspectors. The number of authorized Professional posts in the Division of Operations will thus be 80 in 1974. Recruitment of the 20 additional inspectors is now foreseen for mid-1974. These estimates will be kept under review and revised in the light of the Agency's commitments and as more experience is gained, particularly in applying safeguards in connection with NPT, and as new developments in safeguarding techniques are put into practice.

V. 13. 74. Three additional GS posts will be required in 1974 for the second half of the year to provide support for the larger inspection staff.

COSTS

V. 13. 75. It is expected that the total cost of the safeguards programme will increase by $142 000 in 1973 resulting from salary and price increases of $194 000 partly offset by a programme reduction of $52 000 as compared with the revised budget estimate for 1972. Since the revised estimate for 1972 was made at a time when the manpower requirements for 1972 referred to above had not yet been finally decided upon, the salaries for 1973 reflect a programme reduction of $86 000 and a related reduction in common staff costs of $39 300 as compared with the revised estimate for 1972.

V. 13. 76. Cost increases attributable to higher salaries and related common staff costs amount to $148 600. Funds for consultants and temporary assistance are provided in the same amount as in 1972; this will entail a programme reduction of $1200, since the price increases in respect of those two items are expected to be $1200. Price increases in travel due to higher air fares and per diem rates of $20 000 will be offset by a $20 000 programme reduction. Of the $16 000 increase in funds for meetings, $4000 constitutes price increases and the remaining $12 000 represents a programme increase. Of the slight increase in hospitality funds of $700, $200 is in respect of price increases and $500 represents a programme increase.

V. 13. 77. There is also a shift in the provision of funds from scientific and technical contracts to scientific supplies and equipment. Total funds provided for scientific and technical contracts have been reduced by $40 000, which in view of price increases of $8000 results in a reduction in the programme of $48 000, and funds for scientific supplies and equipment have been increased by $72 000, of which $12 000 is to cover price increases and $60 000 a programme increase.

V. 13. 78. Funds in the amount of $120 000 are provided under "Other items of expenditure" for 1973 to cover initial expenditure for laboratory equipment for the safeguards analytical work.

V. 13. 79. Further purchases of equipment for the safeguards analytical laboratory to a total value of $250 000 and $30 000 are foreseen for 1974 and 1975 respectively. In 1975 funds will have to be provided for the implementation of analytical services through the network of laboratories working under contract and for the operation of the central safeguards analytical laboratory.

V. 13. 80. It is expected that for 1974 the cost of this programme will increase by $662 000, of which $128 000 is required to offset salary and other price increases and the balance of $534 000 represents a programme expansion.

14. SERVICE AND SUPPORT ACTIVITIES

Summary of costs

Table V. 14. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	468 082	466 000	49 700	7 000	56 700	522 700	545 000
Consultants	-	-	-	-	-	-	-
Overtime	438	1 000	100	-	100	1 100	1 200
Temporary assistance	20 692	6 000	700	-	700	6 700	7 500
Sub-total	489 212	473 000	50 500	7 000	57 500	530 500	553 700
Common staff costs	171 111	160 800	9 100	1 400	10 500	171 300	180 000
Travel	-	200	-	-	-	200	300
Meetings							
Panels and committees	-	-	-	-	-	-	-
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	-	-	-	-	-	-	-
Scientific and technical contracts	5 343	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	-	-	-	-	-	-	-
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	665 666	634 000	59 600 9.4%	8 400 1.3%	68 000 10.7%	702 000	734 000

Summary of manpower

Table V. 14. 2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	2	2	2	-	2	2
P-5	6	6	5	-	5	5
P-4	15	15	14	4	18	18
P-3	30	30	28	(4)	24	24
P-2	2	2	1	-	1	1
P-1	-	-	-	-	-	-
Sub-total	55	55	50	-	50	50
GS	47	47	41	-	41	41
M&O	1	1	1	-	1	1
Sub-total	103[a/]	103[a/]	92[b/]	-	92[b/]	92[b/]
Less:						
1. The proportion of the staff working for the policy-making organs						
D and P	20	20	19	-	19	19
GS	18	18	18	-	18	18
M&O	-	-	-	-	-	-
2. The remaining interpreters [c/]						
P	-	-	7	1	8	8
GS	-	-	1	-	1	1
TOTAL	65	65	47	(1)	46	46

a/ Total staff of the former Division of Languages, the former Secretariat of the General Conference and the Board of Governors, the former Research Contracts Section and the former Scientific Conferences Section.

b/ Total staff of the Division of Languages and Policy-making Organs.

c/ See para. V. 14. 13 below.

THE PROGRAMME

STRUCTURE

V. 14. 1. This programme consists of two sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

TRANSLATION AND RECORDS SERVICES

OBJECTIVE

V. 14. 2. The objective is to translate documents, working papers, reports, correspondence and publications, to provide advice on linguistic matters, and to prepare and edit the records of meetings of the Agency's policy-making organs, of other advisory bodies and of certain scientific meetings and to provide other Divisions with typing and proof-reading services when necessary.

RESULTS TO DATE

V. 14. 3. This sub-programme was initiated in 1957. The four languages chiefly used are English, French, Russian and Spanish, and to a lesser extent translations from other languages, particularly German are required. During the period 1965-68 the total annual work load remained fairly constant, amounting to 26 000 to 27 000 standard pages of translated material and 67 000 to 69 000 typed standard pages per year; in 1969 it was slightly reduced, amounting to 25 000 and 60 000 pages respectively. However, in 1970 it rose to nearly 30 000 and 71 000 pages respectively as a result of the meetings of the Board's safeguards committee. In 1971, it was about the same as in 1965-68.

PLANS FOR 1973-74

V. 14. 4. It is expected that the resumption in 1973 of certain types of translation work, particularly some translations into French, that was discontinued some time ago and the negotiation and conclusion of a number of NPT safeguards agreements will lead to an increase in the work load next year and in 1974. Furthermore, should there be an increase in the documentation urgently required for the policy-making organs such as resulted from the meetings of the Ad Hoc Committee of the Whole to Review Article VI of the Statute and the safeguards committee, it may be necessary to have recourse to the services of temporary staff to a greater extent than in the recent past.

PLANS FOR 1975-78

V. 14. 5. The work load is expected to be about the same as in 1973-74. However, the terminology unit may need to be enlarged to enable multilingual glossaries on particular subjects such as safeguards to be compiled.

INTERPRETATION SERVICES

OBJECTIVE

V. 14. 6. The objective is to provide simultaneous (or occasionally consecutive) interpretation whenever required at the meetings of all kinds which the Agency organizes or co-sponsors, and to provide the Secretariat with such interpretation services as it may need.

RESULTS TO DATE

V. 14. 7. This sub-programme was initiated in 1957. After an initial period of gradual increase, the total annual work load, involving the regular use of four languages, became fairly constant at 1700-1900 man-days of interpretation, with an exceptional peak of 2175 man-days in 1970 mainly as a result of the meetings of the Board's safeguards committee. Because of the uneven distribution of meetings over the year, free-lance interpreters have had to be engaged to supplement staff interpreters in order to provide about a third of the services required.

PLANS FOR 1973-74

V. 14. 8. Current trends in the Agency's activities indicate that the work load may increase somewhat in 1973-74.

PLANS FOR 1975-78

V. 14. 9. At present there are no indications that the work load in 1975-78 will be substantially different from that in 1973-74.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 14. 10. Under an agreement which the Agency has with UNIDO, both organizations have, since the end of 1967, made their interpreters available to each other, a cash payment at an agreed rate per man-day being made at the end of each year for any outstanding balances in the services which have been provided. This arrangement has proved most advantageous in terms of both cost and expediency, particularly since there are few free-lance interpreters in Vienna who meet the Agency's requirements.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 14. 11. Staff in the Division of Languages and Policy-making Organs perform all the service and support activities, but, as has already been pointed out in paragraph V. 1. 5 above, the services that they provide for the policy-making organs represent a very considerable proportion of their work. As explained in greater detail in paragraphs V. 15. 64 and V. 15. 65 below, the Research Contracts Section and the Scientific Conferences Section, which were dealt with in the corresponding part of the current year's programme budget [V. 14. 1], have now been incorporated in the Division of Budget and Finance and the Division of External Relations respectively.

V. 14. 12. For the translation and records services, it is planned to upgrade two P-3 posts to the P-4 level in 1973. As regards the interpretation services, it will be noted that one post has been eliminated under the revised manning table for 1972; for 1973 it is planned to upgrade one post from the P-3 to the P-4 level. For 1974 no further change in the manning table is foreseen.

[V. 14. 1] GC(XV)/460, Tables 45-48 and paras V. 14. 3-V. 14. 7.

COSTS

V. 14. 13. Since the cost of providing interpretation services is entirely attributed to the different programmes for which interpretation is required, this cost is not reflected in Table V. 14. 1 above; furthermore the cost of providing translation and records services for the policy-making organs is also excluded. [V. 14. 2] It will be seen that the costs with which the Table deals are expected to increase in 1973 by $68 000, of which $59 600 represents salary and price increases and $8400 the cost of expanding the programme; the latter amount is needed in the expectation that the savings accruing from unfilled posts next year will be less than that now assumed for the current year. For 1974 it can be expected that the cost of this programme will increase by $32 000 which would be attributable to higher prices and salaries.

Summary of total costs by organization unit

Table V. 14. 3

Organization unit	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Division of Languages and Policy-making Organs	665 666	634 000	59 600	8 400	68 000	702 000	734 000
Research Contracts Section	-a/	-	-	-	-	-	-
Scientific Conferences Section	-a/	-	-	-	-	-	-
TOTAL	665 666	634 000	59 600 9. 4%	8 400 1. 3%	68 000 10. 7%	702 000	734 000

a/ Included in Administration for comparison with following years.

[V. 14. 2] Reference to Tables V. 14. 2 and V. 14. 4 makes the distribution of costs clear.

Summary of manpower by organization unit and category

Table V.14.4

Organization unit	1971 Revised budget				1972 Revised budget				1973 Estimate				1974 Preliminary estimate			
	D and P	GS	M&O	Total	D and P	GS	M&O	Total	D and P	GS	M&O	Total	D and P	GS	M&O	Total
Division of Languages and Policy-making Organs	51	41	1	93	50	41	1	92	50	41	1	92	50	41	1	92
Less:																
The proportion of the staff working for the policy-making organs	20	18	-	38	19	18	-	37	19	18	-	37	19	18	-	37
The remaining interpreters [a]	-	-	-	-	7	1	-	8	7	1	-	8	7	1	-	8
Sub-total	31	23	1	55	24	22	1	47	24	22	1	47	24	22	1	47
Research Contracts Section	1	3	-	4	[b]	-	-	-	-	-	-	-	-	-	-	-
Scientific Conferences Section	3	3	-	6	[b]	-	-	-	-	-	-	-	-	-	-	-
TOTAL	35	29	1	65	24	22	1	47	24	22	1	47	24	22	1	47

[a] See para. V.14.13 above.
[b] Included in Administration.

15. ADMINISTRATION

Summary of costs

Table V.15.1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	1 171 681	1 334 100	154 400	(39 500)	114 900	1 449 000	1 525 300
Consultants	7 770	300	-	-	-	300	400
Overtime	1 683	700	100	700	800	1 500	1 700
Temporary assistance	12 455	7 500	800	(1 300)	(500)	7 000	7 700
Sub-total	1 193 589	1 342 600	155 300	(40 100)	115 200	1 457 800	1 535 100
Common staff costs	434 856	459 900	26 000	(11 100)	14 900	474 800	503 300
Travel	19 269	21 200	2 000	300	2 300	23 500	26 000
Meetings							
Panels and committees	2 918	11 600	1 000	11 400	12 400	24 000	-
Seminars, symposia and conferences	25 059	26 000	-	(26 000)	(26 000)	-	28 500
Representation and hospitality	8 674	9 200	300	200	500	9 700	9 900
Scientific and technical contracts	-	-	-	-	-	-	-
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	137 187	64 500	8 000	6 700	14 700	79 200	83 700
Other items of expenditure	19 381	20 000	1 000	-	1 000	21 000	22 500
TOTAL	1 840 933	1 955 000	193 600 9.9%	(58 600) (3.0%)	135 000 6.9%	2 090 000	2 209 000

Summary of manpower

Table V.15.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	1	1	1	-	1	1
D	6	6	6	-	6	6
P-5	14	14	16	-	16	16
P-4	13	13	13	-	13	13
P-3	9	9	11	-	11	11
P-2	6	6	8	-	8	8
P-1	8	8	7	-	7	7
Sub-total	57	57	62	-	62	62
GS	74	75	82	-	82	82
M&O	-	-	-	-	-	-
TOTAL	131	132	144	-	144	144

THE PROGRAMME

OBJECTIVE

V. 15. 1. The objective is to ensure the effective functioning of the Agency's administrative activities. The Office of the Deputy Director General for Administration is responsible for the overall direction and supervision of the internal audit and management, budget and finance, personnel, legal and external relations services, in addition to the services provided for the policy-making organs (see paragraphs V. 1. 1-V. 1. 4 above), the language services (see paragraphs V. 14. 2-V. 14. 5 above), and the other services required.

STRUCTURE

V. 15. 2. This programme consists of five sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

OFFICE OF INTERNAL AUDIT AND MANAGEMENT SERVICES

OBJECTIVE

V. 15. 3. The objective is to assist the Director General in achieving the most effective and economic use of the Agency's resources by:

(a) Reviewing the Agency's financial transactions in order to ensure observance of established regulations and procedures;

(b) Providing a management advisory service to all Departments; and

(c) Compiling and keeping up to date the Agency's Administrative Manual and other administrative instructions.

BUDGET AND FINANCE SERVICES

OBJECTIVE

V. 15. 4. The objective is to develop and implement programme, budgetary and financial procedures to ensure effective financial control and the attainment of programme objectives with the most economic use of available financial resources, and to maintain records of all Agency agreements and contracts to ensure that all payments are made or received in accordance with contractual provisions.

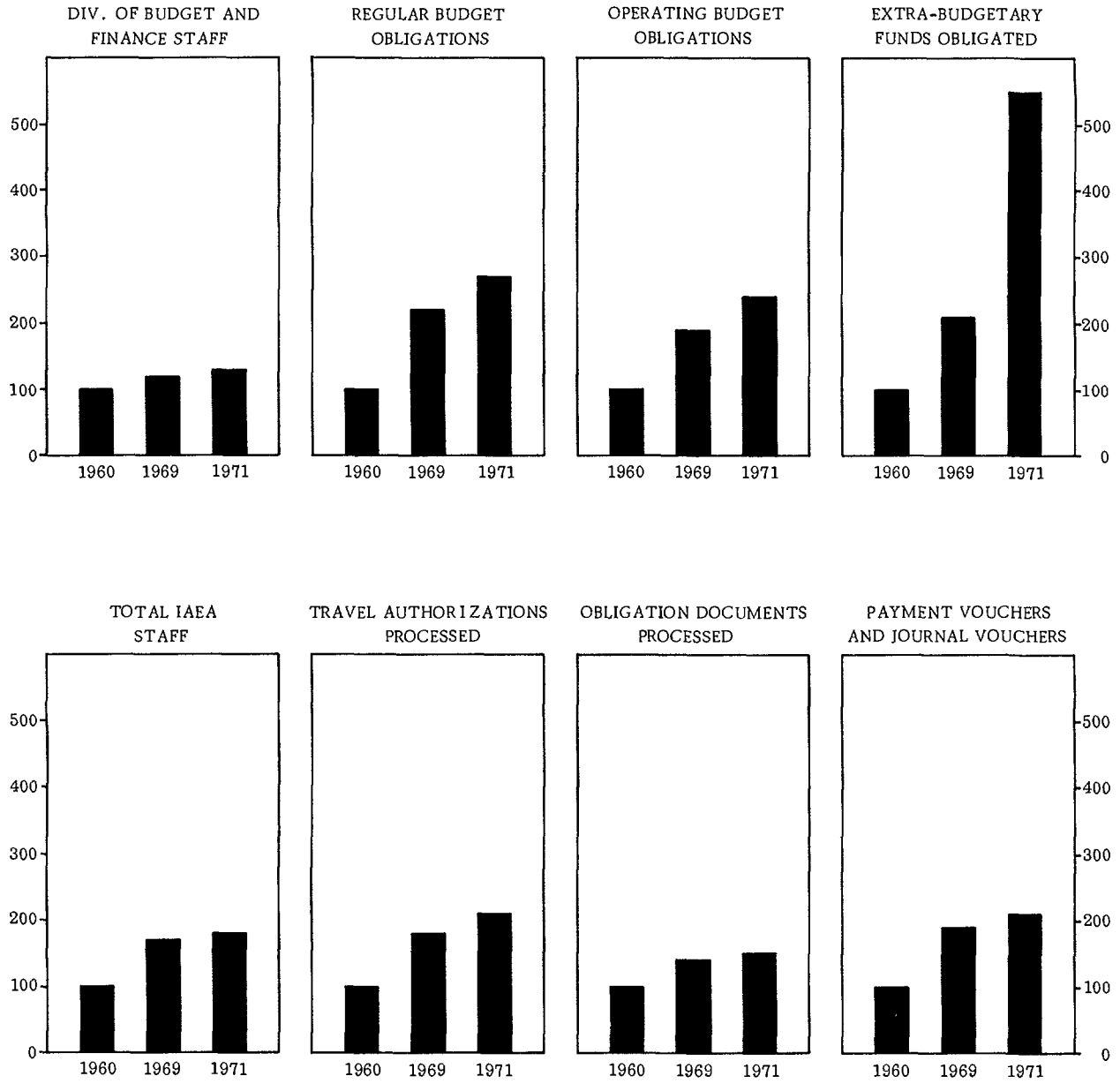
RESULTS TO DATE

V. 15. 5. Since the inception of the Agency the Division of Budget and Finance has been responsible for budgeting and financial administration involving the sum of approximately $172. 8 million made up as follows: Regular Budgets ($117. 5 million); Operating Budgets ($20. 9 million); extra-budgetary resources including UNDP ($23. 9 million); and contributions in services or in kind ($10. 5 million). Improvements in programme planning and budgetary procedures and presentation have been initiated, including conversion to a programme-budget and a six-year programme cycle. Conversion to computerized accounting should be completed during 1972. Financial savings to both the Agency and UNIDO have resulted from careful co-ordination of, and control over, joint services in the fields of procurement, interpretation, medical service, reproduction and printing, and computer utilization.

V. 15. 6. An indication of the trend in the number of staff provided for the Division in the manning table in Annex V compared with several indices most relevant to the measurement of the Division's work load is given in the figure below. It is to be noted that with an increase of approximately 30% in staff the work load has increased at a much higher rate ranging from 80% for payroll activities to 210% for payment and journal vouchers processed.

FIGURE 5

STAFF AND WORKLOAD TRENDS, 1960 - 1971
(1960 = Index of 100 in all cases)



PLANS FOR 1973-74

V.15.7. The Division of Budget and Finance will continue to:

(a) Provide cost accounting and other services to the Secretariat and for the IAEA/UNIDO common service activities;

(b) Carry out the necessary work relating to Member States' contributions to the Regular and Operational Budgets;

(c) Be responsible for programme budgeting, to ensure the most effective use of resources and to facilitate planning and control of activities;

(d) Keep financial records and provide the data required for effective financial management of the Agency; and

(e) Be responsible for research contract administration and for maintenance of centralized records of all Agency contracts and agreements so that payments by or to the Agency will be made on a timely basis.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.15.8. The Division of Budget and Finance is responsible for financial execution of UNDP projects and reporting thereon as required. It co-operates with CCAQ by participating in inter-agency meetings on financial and budgetary matters, particularly with a view to supporting the further implementation of the recommendations of the General Assembly's Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies [V.15.1] and contributing to the improvement of common practices. The Division represents the Agency in the annual review of the programme and budget by ACABQ and co-ordinates with UNESCO the joint operation of the Trieste Centre. It also co-ordinates with FAO the financial operations of the Joint FAO/IAEA Division. It is responsible for co-ordinating with the Joint Inspection Unit the action taken on the latter's reports and for liaison with its inspectors. In addition, it co-ordinates joint services with UNIDO, with particular emphasis on financial and management aspects.

PERSONNEL SERVICES

OBJECTIVE

V.15.9. The objective is to recruit staff and provide administrative and welfare services to all staff members with a view to achieving the optimum use of available manpower resources.

RESULTS TO DATE

V.15.10. The redeployment of posts to allow more manpower to be devoted to activities which require special emphasis has helped to limit the growth of the staff as a whole. As a result of past studies of staff utilization and deployment, it has been possible to effect some measure of consolidation by bringing related services into one area - a policy that is expected to lead to the setting free of some additional Professional posts.

V.15.11. The Agency's policy on tenure of appointments results in a large part of the Professional staff serving only on fixed-term contracts. Since it is not easy to find trained and competent personnel in the specialized fields concerned, the assistance

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[V.15.1] See United Nations document A/6343.

provided by national atomic energy commissions, and their policy of seconding staff for service in the Agency, is an important factor in the success achieved so far in recruiting qualified staff. However, under the present recruitment system which provides for Professional vacancy notices to be distributed through Governments of Member States, these notices are sometimes not passed on to universities, laboratories and other institutions from which worth-while candidates could be obtained.

V.15.12. Negotiations have been completed with the Austrian Ministry of Social Affairs to improve the benefits which are available to the staff under Austrian provisions for social security. The Agency's health insurance plans have been refined and the handling of claims and reimbursements fully computerized, resulting in savings of clerical effort, greater accuracy and increases in speed of reimbursement. The provisions of the system and those of the UNIDO health insurance plans have been unified. New provisions for the group life insurance have been negotiated, resulting in improved benefits at lower premiums.

V.15.13. The Medical Service is now operated jointly by IAEA and UNIDO, its cost being shared by the two organizations.

V.15.14. The development and implementation of new personnel policies necessitates revisions of and amendments to the Staff Regulations and Rules, in order to reflect in clear legal form the new conditions. Staff Rules dealing with the following matters have thus been the subject of substantial revision during the last few years: sick leave, overtime, tax reimbursement, compensation for service-incurred loss of or damage to personal property, and removal of household goods.

V.15.15. In addition, the Staff Rules for Short-term Staff were completely revised and brought in line with the requirements of the common system.

V.15.16. Of almost the same importance are the procedures dealing with staff administration. New procedures were developed or revisions were completed in respect of: health insurance, joint committees and advisory panels, and Special Service Agreements. Instructions of a more explanatory nature on pensions and the Staff Association were likewise established and incorporated in the Administrative Manual.

PLANS FOR 1973-74

V.15.17. The Division of Personnel will perform the following functions:

(a) Recruit both the international and local staff required for implementing the programmes of the Agency, and develop and apply procedures relevant thereto. In order to ensure a better selection of candidates for Professional posts, and at the same time to meet the requirements of recruitment on a multinational basis, it is planned to introduce improvements. The improvements envisaged would consist of:

(i) Requesting Governments of Member States to aim at a wider distribution of vacancy notices;

(ii) Advertising to find applicants for vacancies that are particularly difficult to fill; and

(iii) Intensifying recruitment efforts by applying new methods of gathering and sorting information, interviewing on the spot, and establishing rosters of candidates. The results of surveys of local salaries and conditions of employment will continue to serve as guidelines for establishing equitable salary scales for GS and M&O staff;

(b) Administer and interpret the Agency's Provisional Staff Regulations and Rules, and other regulations, rules and procedures applicable to persons serving under contract with the Agency;

(c) Develop and review personnel policies and procedures, and introduce and implement such changes as may result from recommendations made by the Special Committee for the Review of the United Nations Salary System, e. g. the introduction of new categories of staff or revisions in the system of emoluments;

(d) Provide for staff welfare, including arrangements for group medical and group life insurance schemes. These schemes will be subject to review in 1973 to ascertain whether improvements benefiting the staff can be achieved;

(e) Provide training, except that required for safeguards and inspection and computer programming courses, and deal with all questions related thereto;

(f) Arrange for and supervise utilization and deployment studies in connection with any proposed additions or reclassifications of posts for inclusion in the 1974 budget estimates, and review the grading of GS and M&O staff by means of periodic surveys in specific areas;

(g) Provide advice to the Director General on all personnel matters, including those dealt with within the framework of the United Nations common system and those which are the subject of discussion at the inter-organizational level; and

(h) Administer the Agency/UNIDO Joint Medical Service.

PLANS FOR 1975-78

V. 15. 18. The Division's activities will continue to be substantially the same as in 1973-74. To maintain an equitable balance between increased safeguards activities and the other activities of the Agency special care will have to be exercised to ensure the best use of available manpower. A review of the programme activities in relation to the Professional staff will therefore have to be continued to avoid a rapid increase in staff costs.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 15. 19. In developing guidelines and policies to attain the above objective, the Agency is guided by the results of consultations held with other organizations within the United Nations common system.

V. 15. 20. Local conditions of recruitment, post classifications and promotion policies for GS and M&O staff are co-ordinated with UNIDO, the other international organization based in Vienna, and common services for the two organizations in certain areas are established.

V. 15. 21. Current procedures for recruiting Professional staff include the circulation of vacancy notices to other international organizations with the aim of promoting interchange of staff.

LEGAL SERVICES

OBJECTIVE

V. 15. 22. The objective is:

(a) To give the Director General legal advice and to provide legal services to the Secretariat relating to all matters concerning the operations of the Agency;

(b) To collect, study and computerize information on nuclear law with a view to assisting Member States;

(c) To carry out training of officials of Member States in the field of nuclear law;

(d) To draft, negotiate and conclude agreements with States and other international organizations, and to advise on the interpretation and application thereof, in particular with regard to safeguards agreements and the Headquarters Agreement [V. 15. 2];

(e) To defend the Agency's interests in contentious cases; and

(f) To promote developments in international law which are of interest to the Agency, in particular in the field of nuclear law.

RESULTS TO DATE

V. 15. 23. This sub-programme was initiated in 1957. Eighty-two officials from more than 50 Member States took part in three training courses held since 1968, and 18 officials from 11 Member States received training as resident trainees at the Agency's Headquarters. Three Conventions were adopted at diplomatic conferences. The Agency was brought before the ILO Administrative Tribunal in seven cases; in five cases the Tribunal decided in favour of the Agency, and the remaining two are awaiting decision.

CO-OPERATION WITH OTHER ORGANIZATIONS

V. 15. 24. This sub-programme involves close co-operation with FAO and WHO in dealing with the regulatory aspects of nuclear activities, with IMCO in studying civil liability in the field of maritime carriage of nuclear materials, with UNITAR in regard to training, and with OECD (NEA) in regulatory and nuclear liability matters.

STRUCTURE

V. 15. 25. This sub-programme consists of four components which are described in the following paragraphs.

Safeguards agreements

Objective

V. 15. 26. The objective is to draft, negotiate and conclude agreements with States and other international organizations, and to advise on the interpretation and application thereof, in particular with regard to safeguards agreements in connection with NPT.

[V. 15. 2] INFCIRC/15.

Results to date

V. 15. 27. This component was initiated in 1960. Sixty-eight non-nuclear-weapon States which are now party to NPT must negotiate and conclude with the Agency safeguards agreements in connection with NPT. By the end of June 1972, 25 of these agreements had been approved by the Board, and it is expected that the remaining agreements will have been negotiated by 1973.

Plans for 1973-74

V. 15. 28. The deliberations that led to the formulation of "The Structure and Content of Agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons" [V. 13. 1] and the subsequent negotiations for such agreements together constitute extensive material for the interpretation and application of the agreements. This material is now being analysed with a view to achieving a general, objective and uniform understanding of these agreements. It will be necessary to convene the first meeting of consultants to study this material in 1973.

Plans for 1975-78

V. 15. 29. A second consultants' meeting will be convened in 1975 for the same purpose as in 1973.

Information and assistance in regard to nuclear law

Objective

V. 15. 30. The objective is to collect, study, computerize and disseminate information on nuclear law, and to assist Member States in the framing of basic legislation and safety regulations for nuclear activities.

Results to date

V. 15. 31. The work relating to the first objective mentioned above was initiated in 1958 and that relating to the second objective was initiated in 1960. A data-processing system for national nuclear legislation is being established; surveys of existing nuclear legislation in Member States in Asia, Africa and the Middle East, and Latin America have been made, as well as surveys of national legislation on food irradiation and on the licensing of nuclear installations.

V. 15. 32. Draft articles based on the Vienna Convention on Civil Liability for Nuclear Damage [V. 15. 3] were elaborated in 1966. Outlines of the basic elements of legislation for radiation protection, recommended by a study group on the subject which met in 1969, have been prepared. A panel of experts, which met in 1969, prepared a report on insurance for nuclear installations, with special reference to the developing countries, which has been published [V. 15. 4].

V. 15. 33. Assistance in the drafting of atomic energy legislation has been provided to 15 Member States.

Plans for 1973-74

V. 15. 34. With regard to regulations and procedures relating to the licensing of nuclear power plants, a panel of experts will be convened in 1973 to draw up guidelines for adequate legislation. The provision of advisory services in the elaboration of legislation

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[V. 15. 3] Legal Series No. 4.

[V. 15. 4] Legal Series No. 6.

dealing with the regulatory, liability and safeguards aspects of nuclear activities is expected to increase. The study of legal issues resulting from the United Nations Conference on the Human Environment in 1972 will be initiated during this period.

Plans for 1975-78

V. 15. 35. The licensing of nuclear power plants and associated facilities and the development of national safeguards systems will continue to be the main areas in which work will be done and assistance provided to Member States. In addition, regulatory measures for environmental protection may be the subject of a consultants' meeting to be convened during this period.

Training in nuclear law

Objective

V. 15. 36. The objective is to train officials of Member States in nuclear law.

Results to date

V. 15. 37. This component was initiated in 1967. In-service training has been provided to 18 trainees from 11 countries. Two training courses, in 1968 and 1970, and a regional seminar for Asia and the Far East, in 1970, have been organized.

Plans for 1973-74

V. 15. 38. A course for Latin America will be organized in 1973, and in-service training will continue to be provided upon request by Member States or in co-operation with UNITAR.

Plans for 1975-78

V. 15. 39. Further training courses may be needed for Africa and the Middle East, Asia and the Far East.

International law

Objective

V. 15. 40. The objective is to promote developments in international law which are of interest to the Agency, particularly in the field of nuclear law.

Results to date

V. 15. 41. This component was initiated in 1958. Three international conventions relating to civil liability for nuclear damage have been signed, namely the Vienna Convention on Civil Liability for Nuclear Damage, the Brussels Convention on the Liability of Operators of Nuclear Ships [V. 15. 3] and the Brussels Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material. Assistance has been provided in the preparation of other treaties and conventions covering various fields of international law.

Plans for 1973-78

V. 15. 42. In following developments in international law which are of particular interest to international organizations or in relation to nuclear law, the Agency will continue to take part, as necessary, in the preparation of conventions which have a bearing on its activities.

EXTERNAL RELATIONS

OBJECTIVE

V. 15. 43. The objective is to maintain effective relations with Member States, other organizations and the public.

STRUCTURE

V. 15. 44. This sub-programme consists of three components which are described in the following paragraphs.

Inter-Agency affairs, Protocol and Liaison

Objective

V. 15. 45. The objective is to maintain effective relations and promote efficient co-operation with the Governments of Member States, including the host Government, with the United Nations and its specialized agencies, and other intergovernmental and non-governmental organizations of an international or regional character.

Results to date

V. 15. 46. Eight relationship agreements with United Nations organizations and five co-operation agreements with intergovernmental organizations have been concluded. Special arrangements have been made in certain programme areas, e. g. with FAO, WHO and UNIDO. Each year approximately 1700 visa applications have been dealt with and about 120 circular letters have been processed in four languages.

Plans for 1973-74

V. 15. 47. Advice will be given to the Director General and the Departments in the Secretariat on external relations, protocol matters and on the content and form of communications to Governments, the United Nations and other international organizations. Liaison with the host Government in Vienna will be maintained.

V. 15. 48. The Division will compile reports to the General Conference and prepare, or assist in preparing, documents for the General Conference and the Board on matters affecting the external relations of the Agency. It will negotiate or assist in the negotiation of agreements. It will also co-ordinate and arrange for the submission of reports to, and the Agency's representation at, meetings of the United Nations and other international bodies.

V. 15. 49. Through its offices at United Nations Headquarters in New York and in Geneva permanent liaison will be maintained with the United Nations and with the Geneva-based organizations of the United Nations.

Plans for 1975-78

V. 15. 50. The work will continue as outlined above.

Public information

Objective

V. 15. 51. The objective is to keep the public informed of the Agency's activities through the media of newspapers, periodicals, radio, television and exhibitions.

Results to date

V. 15. 52. Various films have been produced on the activities of the Agency, including a recent film on the INIS system and another on safeguards. Booklets for the layman have been printed, as well as the Bulletin, which is circulated throughout the world.

Plans for 1973-74

V. 15. 53. Information for the general public will continue to be provided through all media. In view of growing costs and the extent of film industry activities in Member States, emphasis will be placed on the circulation of available films, and not on the production of new ones. Short television films will be produced in collaboration with UNIDO.

V. 15. 54. A special effort will be made to provide information on the Agency's work to selected groups, such as management circles, government officials, public utilities, economists and national federations of industry.

V. 15. 55. In view of the interest shown in the monograph, Science Features, its publication will be resumed, but on a reduced scale. The Bulletin will continue to be published at two-monthly intervals. Special booklets and pamphlets will be prepared illustrating particularly the Agency's role in environmental protection, safeguards, the use of isotopes, INIS and technical assistance.

Plans for 1975-78

V. 15. 56. Growing public interest in certain problems, such as pollution of the environment, the population explosion, the need for more food and cheap energy, and disarmament, will lead to intensified national, regional and international efforts in which the Agency's role should be publicized. Certain events, such as the conference of parties to NPT in 1975 to review the operation of NPT and the twentieth anniversary of the Agency's establishment in 1977, will help to highlight the Agency's activities.

Conference service

Objective

V. 15. 57. The objective is to administer scientific seminars, symposia and conferences, in addition to servicing Agency meetings in and outside Headquarters, to conduct the necessary liaison between the scientific and administrative units of the Agency and officials and organizations in Member States and international organizations, and to co-ordinate Agency meetings with other scientific meetings, including the compilation of all the necessary data and the issuance of a world list of scientific meetings on atomic energy.

Results to date

V. 15. 58. Each year the necessary services have been provided for some 18 symposia, conferences and seminars (including two or three co-sponsored meetings), the sessions of the General Conference, the meetings of the Board and smaller meetings, and four volumes of the booklet "Meetings on Atomic Energy" have been issued.

Plans for 1973-74

V. 15. 59. The servicing of Agency meetings, both in Vienna and at locations in other Member States, will continue. The number of scientific meetings to be serviced each year will be between 12 and 15.

V. 15. 60. The Agency intends to discontinue in 1973 its financial support of selected scientific meetings organized by non-governmental scientific bodies and to review the position in that regard before 1974.

V. 15. 61. The practice of granting financial assistance to carefully selected applicants from developing countries for attendance at the Agency's meetings will be continued. The Agency will also continue to co-sponsor scientific meetings held by other international organizations and invite appropriate co-sponsorship of its own meetings.

Plans for 1975-78

V. 15. 62. The number of scientific meetings arranged or co-sponsored by the Agency will continue to be between 15 and 18 per year. In addition to servicing these meetings, the Division will continue to carry out in 1975-78 the other work outlined above for 1973-74.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V. 15. 63. As a result of the survey of the utilization and deployment of staff and of organizational changes in the Secretariat, a number of changes have been made in the revised manning table for 1972.

V. 15. 64. In the Office of Internal Audit and Management Services, a P-1 post was exchanged against a P-2 post from another programme. The Research Contracts Section, with one Professional and three GS posts was incorporated in the Division of Budget and Finance and an existing P-4 post was exchanged against a P-5 post from another programme.

V. 15. 65. The Scientific Conferences Section, with three Professional and three GS posts, and a Professional and a GS post from the Common Services programme were incorporated in the Division of External Reations to constitute the Conference Service Section. Public information activities, which had previously constituted a sub-programme, with five Professional and seven GS posts, were also included in the Division of External Relations; furthermore, one Professional post was transferred to that Division from the Legal Division. Finally a P-2 post was upgraded to the P-3 level.

V. 15. 66. No further changes in the manning tables for 1973 and 1974 are foreseen.

COSTS

V. 15. 67. The total cost of this programme is expected to increase by $135 000 in 1973 as a net result of salary and other price increases of $193 600 partly offset by a programme reduction of $58 600.

V. 15. 68. Increases resulting from higher salary, overtime and temporary assistance rates and related common staff costs will amount to $181 300. Although there is no change in the manning table for 1973, the cost of the programme in respect of salaries and wages and related common staff costs will be reduced by $51 200 by keeping an increased number of posts vacant, namely a P-3 post in the Office of Internal Audit and Management Services, a P-4 post which was transferred from the Legal Division to the Division of External Relations, and, partly, a P-4 post in the Public Information Section. Since no funds had been provided in the revised budget for 1972 for the Director's post which had been used in the regional office in the Far East, nor for a vacant P-4 post in the Public Information Section, no additional savings will accrue from the freezing of those posts in 1973. By applying these economies and following the recommendations of the survey of staff utilization and deployment, it is hoped to keep the cost of administration as low as possible.

V. 15. 69. The increase in travel funds of $2300 will be mainly absorbed by higher air fares and per diem rates. As regards scientific meetings, a shift in the provision of

funds from symposia to panels and committees in respect of the Legal Division, and the elimination, for reasons of economy, of $15 000 for "grants-in-aid" in 1973 are foreseen. A small increase in hospitality funds is also foreseen.

V.15.70. The cost of common services, supplies and equipment is expected to increase by $14 700, of which $8000 is to cover price increases. It is estimated that at least an additional $3500 will be required for insurance premiums, bank charges and loss on exchange, an additional $2700 for medical services, supplies and equipment, and an additional $8500 for public information services, supplies and equipment and for services and supplies at the Agency's liaison office at the United Nations Headquarters in New York.

V.15.71. The Agency's contribution to inter-agency activities will increase by $1000.

V.15.72. The income from medical services rendered under the IAEA/UNIDO common services agreement is estimated at $50 000 which is $8000 above the estimate in the 1972 revised budget.

V.15.73. For 1974 the cost of this programme is expected to rise by $119 000 owing to increases in salaries and prices.

Summary of total costs by organization unit

Table V.15.3

Organization unit	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Office of the Deputy Director General for Administration	80 502	97 200	10 400	1 400	11 800	109 000	114 000
Office of Internal Audit and Management	102 126	126 600	10 600	(18 200)	(7 600)	119 000	125 000
Division of Budget and Finance	510 981	498 100	51 500	(600)	50 900	549 000	582 000
Division of External Relations	577 856	585 400	68 400	(22 800)	45 600	631 000	679 000
Legal Division	233 727	272 300	12 900	(20 200)	(7 300)	265 000	267 000
Division of Personnel	335 741	375 400	39 800	1 800	41 600	417 000	442 000
TOTAL	1 840 933	1 955 000	193 600 9.9%	(58 600) (3 0%)	135 000 6.9%	2 090 000	2 209 000

Summary of manpower by organization unit and category

Table V.15.4

Organization unit	1971 Revised budget				1972 Revised budget				1973 Estimate				1974 Preliminary estimate			
	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total
Office of the Deputy Director General for Administration	3	2	-	5	3	2	-	5	3	2	-	5	3	2	-	5
Office of Internal Audit and Management	5	4	-	9	5	4	-	9	5	4	-	9	5	4	-	9
Division of Budget and Finance	15	24	-	39	16	28	-	44	16	28	-	44	16	28	-	44
Division of External Relations	10	10	-	20	20	21	-	41	20	21	-	41	20	21	-	41
Legal Division	9	5	-	14	8	5	-	13	8	5	-	13	8	5	-	13
Division of Personnel	10	22	-	32	10	22	-	32	10	22	-	32	10	22	-	32
Public Information Section	5	7	-	12	a/	-	-	-	-	-	-	-	-	-	-	-
TOTAL	57	74	-	131	62	82	-	144	62	82	-	144	62	82	-	144

a/ Included in Division of External Relations.

16. COMMON SERVICES

Summary of costs

Table V. 16. 1

Item of expenditure	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	1 159 511	1 330 900	221 300	3 500	224 800	1 555 700	1 687 000
Consultants	-	500	-	-	-	500	500
Overtime	36 743	9 400	1 000	6 400	7 400	16 800	16 900
Temporary assistance	26 904	30 800	1 200	(20 000)	(18 800)	12 000	12 300
Sub-total	1 223 158	1 371 600	223 500	(10 100)	213 400	1 585 000	1 716 700
Common staff costs	436 680	459 200	49 600	700	50 300	509 500	556 800
Travel	507	1 000	100	200	300	1 300	1 300
Meetings							
Panels and committees	-	-	-	-	-	-	-
Seminars, symposia and conferences	-	-	-	-	-	-	-
Representation and hospitality	133	200	-	-	-	200	200
Scientific and technical contracts	640	9 000	1 000	2 000	3 000	12 000	12 000
Scientific supplies and equipment	-	-	-	-	-	-	-
Common services, supplies and equipment	825 992	937 000	120 000	(41 000)	79 000	1 016 000	1 099 000
Other items of expenditure	-	-	-	-	-	-	-
TOTAL	2 487 110	2 778 000	394 200 14 2%	(48 200) (1 7%)	346 000 12. 5%	3 124 000	3 386 000

Summary of manpower

Table V.16.2

Grade of post	Number of established posts					
	1971 Revised	1972	1972 Revised	Change	1973	1974 Preliminary estimate
DG	-	-	-	-	-	-
DDG	-	-	-	-	-	-
D	2	2	2	-	2	2
P-5	2	2	2	-	2	2
P-4	3	3	3	-	3	3
P-3	7	7	8	-	8	8
P-2	6	6	4	1	5	5
P-1	5	5	5	(1)	4	4
Sub-total	25	25	24	-	24	24
GS	135	138	137	1	138	141
M&O	133	131	133	-	133	139
Sub-total	293	294	294	1	295	304
Less:						
Staff working for policy-making organs						
P	-	-	-	-	-	-
GS	6	6	6	-	6	6
M&O	3	3	3	-	3	3
TOTAL	284	285	285	1	286	295

THE PROGRAMME

STRUCTURE

V.16.1. This programme consists of three sub-programmes which are dealt with separately below.

SUB-PROGRAMMES

GENERAL SERVICES

OBJECTIVE

V.16.2. The objective is to provide engineering, architectural and maintenance services for the headquarters premises, the Seibersdorf Laboratory, the Monaco Laboratory and the Trieste Centre, customs, security and telecommunication services, registry and messenger services, including archives and purchasing, supply and transportation services, to participate in the planning of the new permanent headquarters, and to operate the Agency's commissary and restaurant.

RESULTS TO DATE

V.16.3. This sub-programme was initiated in 1957. The present temporary headquarters premises have been renovated, expanded and equipped. Additional premises have been obtained in Traungasse in negotiation with the Austrian Government. Negotiations on a new Commissary Agreement have been completed. In co-operation with the Austrian Government and UNIDO, the initial planning in connection with the permanent headquarters has been completed and it is envisaged that the ground will be broken during 1973.

PLANS FOR 1973-74

V.16.4. The Division of General Services will continue to provide normal housekeeping and maintenance services for the operation of the Agency's facilities and to provide various other services and supplies required for the efficient operation of the Agency's programmes. Negotiations with the Government of Austria for the allocation of additional space will continue. In co-operation with the Austrian Government and UNIDO, planning in connection with the permanent headquarters will continue in respect of functional requirements, matters relating to maintenance and operation costs, and installations.

PLANS FOR 1975-78

V.16.5. During this period the routine work of the Division will continue, and it is planned to prepare for and carry out the transfer from the temporary headquarters to the permanent headquarters.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.16.6. This sub-programme involves co-operation with UNIDO in regard to a central purchasing office and the planning of the permanent headquarters and with other United Nations organizations in regard to the planning of the permanent headquarters, facilities, purchasing and registry services.

PUBLISHING SERVICES

OBJECTIVE

V.16.7. The objective is to prepare and distribute Agency publications and to act as a publisher for other international organizations, for example the United Nations, ILO, FAO, UNESCO and WHO, thus ensuring the wide dissemination of information on the peaceful uses of atomic energy in Member States as rapidly and economically as possible.

RESULTS TO DATE

V.16.8. Since 1960 the Agency's contribution to world literature dealing with nuclear science and technology has consisted of 720 publications. During the period 1966-1971 about 60 publications (28 000 pages) have been produced per year.

V.16.9. The production and distribution costs of the publications programme are increasingly covered by income from sales and special publications projects. About 900 copies of each publication are provided free of charge to Member States per year, representing a sales value of $440 000. The income derived from the sale of publications now averages $250 000 per year, excluding that from special projects, such as the proceedings of the Fourth Geneva Conference which are expected to yield an additional income of $150 000 in 1972.

PLANS FOR 1973-74

V.16.10. The Division of Publication will publish the proceedings of the scientific meetings listed elsewhere in this document, as well as other books and journals reflecting the work of the Agency. The maximum economies will be achieved through a very careful selection of papers proposed for publication and by limiting the volume of unpriced publications to the extent possible. A comprehensive publications catalogue, which is issued every second year, will be published in 1974.

PLANS FOR 1975-78

V.16.11. The content of publications will depend on the Agency's scientific programmes. The nature of the publishing services provided to Member States may be influenced by management decisions relating to the determination of prices of books, the form and presentation of publications and the organization of sales. A continuous effort will be made to achieve increased financial self-support.

RELATED ACTIVITIES

V.16.12. The related activities involve participation in several book fairs and exhibits each year.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.16.13. Publications, most of which relate to jointly organized scientific meetings, are jointly produced with the United Nations, ILO, FAO, UNESCO and WHO.

PRINTING SERVICES

OBJECTIVE

V.16.14. The objective is to provide reproduction and distribution facilities to meet the requirements of the General Conference, the Board, the Secretariat (including the publications programme) and, to the extent possible, UNIDO.

RESULTS TO DATE

V.16.15. The present normal production capacity of approximately 125 million page units per year is sufficient to meet the requirements of the Agency and about 20% of UNIDO's requirements.

PLANS FOR 1973-74

V.16.16. The volume of printing work will be determined by the activities of the Agency and UNIDO. Although some increase may be expected, the present space limitations will not permit any extensive expansion. Production methods will be constantly kept under scrutiny and improved methods introduced whenever possible.

PLANS FOR 1975-78

V.16.17. An expansion and improvement of the printing equipment will only be feasible at the time of the move to the new International Centre, when provision will be made for the expansion and modernization of the reproduction and printing services.

CO-OPERATION WITH OTHER ORGANIZATIONS

V.16.18. The Agency provides printing services to UNIDO on a reimbursable basis and similar services are also provided on an ad hoc basis for meetings in Vienna of other United Nations organizations.

THE PROGRAMME: CHANGES IN MANPOWER AND COSTS

MANPOWER

V.16.19. As a result of organizational changes, one Professional and one GS post were transferred from the Division of General Services to the Conference Section of the Division of External Relations, and two M&O posts which had not been used at the Trieste Centre were transferred to this programme in the revised manning table for 1972. In the Division of Publications, an existing P-2 post was exchanged for a P-3 post from another programme.

V.16.20. For 1973, the upgrading of a P-1 post to the P-2 level in the Division of General Services is foreseen, and one additional GS post will be required in the Division of Publications for a sales promotion clerk.

V.16.21. For 1974 the Division of General Services will require three additional GS posts, for a telephone technician and two registry clerks, and five additional M&O posts for a messenger, three guards and a skilled worker. The Division of Publications will need an additional M&O post for the copying service in Traungasse.

COSTS

V. 16. 22. For 1973 the total cost of this programme is expected to increase by $346 000 as a net result of salary and other price increases of $394 200, partly offset by a programme reduction of $48 200.

V. 16. 23. Increases to meet higher costs in respect of salaries, temporary assistance and overtime rates and related common staff costs amount to $273 100. The programme increase of $4200 in respect of salaries and related common staff costs will cover the cost of the additional GS post for a sales promotion clerk in the Division of Publications. This increase and the increase in funds for overtime required for both Divisions are more than offset by a programme reduction of $20 000 in respect of temporary assistance in the Division of Publications; the latter reduction is possible because the provision in the 1972 budget for the Fourth Geneva Conference will not be required. The estimate for travel is increased by $300 and the provision for authors' fees for publications by $3000, partly because of price increases.

V. 16. 24. The cost of common services, supplies and equipment will increase by a net amount of $79 000. Price increases and the revaluation of currencies result in an increase of $81 000, mainly for utilities and power supply, transportation, service contracts and supplies and equipment chargeable to the Division of General Services, and $39 000 to cover cost increases for the Division of Publications The total increase of $120 000 is partly offset by a reduction of $41 000 in respect of the publications programme, which is the net result of a small programme increase of $2000 offset by a reduction of $43 000 attributable to the fact that the 1972 budget included funds for the Fourth Geneva Conference which will not be required in 1973.

V. 16. 25. The income from the publications programme is estimated at $350 000 for 1973 as compared with $298 000 in the 1972 estimate, which included, however, about $90 000 for the Fourth Geneva Conference. The 1973 estimate is based on actual income in respect of Agency publications in 1971, taking into account an annual sales expansion of 20% which can be expected on the basis of experience during the past two years.

V. 16 26. Income from printing services under the IAEA/UNIDO common services arrangement is estimated at $115 000 for 1973, and income in respect of procurement and general services is estimated at $34 000.

V. 16. 27. The sale of surplus property, including cars, by the Division of General Services is expected to yield an income of $10 000.

V. 16. 28. For 1974 it is expected that the cost of this programme will increase by $262 000, of which $192 000 represents salary and other price increases and $70 000 the cost of an expansion in the programme. The latter would cover the cost of additional GS and M&O staff and higher costs in connection with the new permanent headquarters.

V. 16. 29. Income from the sale of Agency publications is expected to increase by $30 000 and income under the IAEA/UNIDO common services agreement for printing and general services and procurement by $9000.

Summary of total costs by organization unit

Table V.16.3

Organization unit	1971 Actual obligations	1972 Revised budget	Increase or (decrease) from 1972			1973 Estimate	1974 Preliminary estimate
			Price	Programme	Total		
Division of General Services	1 449 774	1 560 700	242 200	4 100	246 300	1 807 000	1 994 000
Division of Publications	1 037 336	1 217 300	152 000	(52 300)	99 700	1 317 000	1 392 000
TOTAL	2 487 110	2 778 000	394 200 14.2%	(48 200) (1.7%)	346 000 12.5%	3 124 000	3 386 000

Summary of manpower by organization unit and category

Table V.16.4

Organization unit	1971 Revised budget				1972 Revised budget				1973 Estimate				1974 Preliminary estimate			
	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total	P	GS	M&O	Total
Division of General Services	9	55	108	172	8	55	108	171	8	55	108	171	8	58	113	179
Division of Publications	16	80	25	121	16	82	25	123	16	83	25	124	16	83	26	125
Less: Staff working for policy-making organs	-	6	3	9	-	6	3	9	-	6	3	9	-	6	3	9
Sub-total	16	74	22	112	16	76	22	114	16	77	22	115	16	77	23	116
TOTAL	25	129	130	284	24	131	130	285	24	132	130	286	24	135	136	295

Costs of common services, supplies and equipment by Division and item of expenditure

Table V. 16. 5

Division and item of expenditure	1971 Actual obligations	1972 Budget	1973 Estimate	1974 Preliminary estimate
Division of General Services				
Services				
Communications	139 775	134 000	159 000	165 000
Freight and transportation	15 610	15 000	17 000	17 700
Rental and maintenance of premises				
Utilities	147 755	164 000	187 000	187 000
Rental of premises	7 260	7 300	7 300	7 300
Alteration and maintenance of premises	27 464	56 700	71 000	71 000
Services connected with planning of new headquarters	-	34 000	36 000	100 000
Rental and maintenance of furniture and equipment	58 716	66 000	62 700	66 000
Sub-total	396 580	477 000	540 000	614 000
Supplies				
Office supplies	31 917	34 500	44 000	47 000
Workshop and maintenance supplies	36 703	38 500	45 000	49 000
Petty cash	3 214	5 000	3 000	3 000
Sub-total	71 834	78 000	92 000	99 000
Equipment				
Office furniture and equipment	88 894	51 500	48 000	48 500
Building equipment	16 049	5 000	10 500	10 500
Transport equipment	8 944	9 500	11 500	5 000
Sub-total	113 887	66 000	70 000	64 000
TOTAL	582 301	621 000	702 000	777 000
Division of Publications				
Services				
Freight	33 805	40 000	41 000	41 000
Rental and maintenance of equipment	15 799	6 000	12 000	13 000
Publications services	25 750	55 000	35 000	36 000
Sub-total	75 354	101 000	88 000	90 000
Supplies				
Printing and reproduction	137 265	184 000	194 000	199 000
Equipment				
Reproduction and information	31 072	31 000	32 000	33 000
TOTAL	243 691	316 000	314 000	322 000
GRAND TOTAL	825 992	937 000	1 016 000	1 099 000

ANNEX I

PANELS AND COMMITTEES

Depending upon the availability of funds and the requirements of the programmes as outlined for 1973, the Director General will select the meetings to be held from those listed below, apart from the meetings of the Scientific Advisory Committee, the International Nuclear Data Committee and the Scientific Council of the Trieste Centre, which are held annually.

Executive management and technical programme planning

1. Scientific Advisory Committee

Food and agriculture

2. Panel on the efficiency of conversion of fertilizer nitrogen into grain protein

3. Panel on isotopes and radiation in rice production studies

4. Panel on mutation breeding of vegetatively propagated and perennial crops

5. Panel on the reorientation of the animal health programme

6. Panel on the application of the sterile male technique for control and eradication of fruit flies

7. Panel on ecology and behaviour of Heliothis complex as related to the sterile male technique

8. Panel on isotope tracer-aided investigations of food and agricultural environment contamination

9. Panel to consider design, operation and auxiliary services for radiation pilot plants

Life sciences

10. Panel on radioactive tracer techniques for the study of gastro-intestinal absorption

11. Panel on techniques for radioisotope renography

12. Panel on advances in computer technology for radiation dosimetry problems

13. Panel on radiation attenuation of parasites for preparation of vaccines (jointly with WHO)

14. Panel on the modification of radiation sensitivity of biological systems

Physical sciences

15. Panel on the applications of neutron generators

16. Panel on the comparison of nuclear techniques in the study of hyperfine fields

17. Panel on the applications of lasers in the controlled fusion programme

18. Meeting of International Fusion Research Council

19. Meeting of Joint Liaison Group on Thermionic Electrical Power Generation

20. Second panel on neutron standard reference data

21. Meeting of the International Nuclear Data Committee

22. Meeting of International Working Group on Nuclear Structure and Reaction Data

23. Panel on the production and utilization of accelerator-produced isotopes

24. Panel on hot atom chemistry or radiation chemistry

25. Panel on the corrosion and mass transport in nuclear reactors

26. Panel on the quality control of radioisotopes and radiopharmaceuticals

27. Panel on activation analysis

28. Panel on nuclear technology for process measurement and control in polymer industries

29. Panel on the interpretation of environmental isotope data in terms of hydrogeological information

30. IHD working group on nuclear techniques

International Centre for Theoretical Physics

31. Meeting of the Scientific Council

Nuclear power and reactors

32. Panel on uranium ore processing

33. Panel on the economics of nuclear power programmes

34. Panel on the training of personnel for nuclear power programmes

35. Working group on nuclear power plant control and instrumentation

36. Panel on welding techniques in nuclear industry

37. Working group on fast reactors

38. Panel on reactor standardization

39. Panel on heat and mass transfer

40. Magnetohydrodynamics Liaison Group

Nuclear safety and environmental protection

41. Panel on the assessment of radiological hazards in uranium and thorium mines

42. Panel on particle size analysis in estimation of airborne contamination

43. Panel on the practical application of quantities and units in the measurement of radiation for protection purposes

44. Panel on the needs for total waste management systems in countries with small nuclear programmes

45. Panel on the environmental impact of thermal discharges from nuclear power plants

46. Panel on the management of wastes arising from emergency situations on land and sea

47. Panel on the code of practice on reactor design and construction

48. Panel to provide guidance on principles and methods for establishing derived working limits for radioactive contaminants in food chains

49. Panel on disposal of radioactive wastes into the sea

50. Panel on discharges of non-radioactive pollutants from the nuclear industry

51. Panel on reference methods for marine radioactivity studies

Information and technical services

52. INIS Panel

53. INIS Advisory Committee

54. INIS Thesaurus Working Group

Safeguards

55. Working group on progress review in safeguards systems analysis and results of integral tests

56. Working group on review of information requirements for safeguards

57. Working group on processing and evaluation of safeguards information

58. Working group on international standards for measurement accuracy and standards of accountability

59. Working group on portable safeguards instrumentation

60. Working group on methods and techniques for safeguarding enrichment facilities

Administration

61. Working group on legal aspects of Agency safeguards and national control systems

62. Working group on legislation on licensing of nuclear installations

ANNEX II

SEMINARS, SYMPOSIA AND CONFERENCES

Within the limits of the appropriations and subject to the requirements of the programmes as outlined for 1973, the Director General will select the meetings to be held from those listed below. Those meetings considered of importance by SAC are indicated by an asterisk.

Food and agriculture

1. Symposium on radiation entomology

*2. Seminar on the use of nuclear techniques in studies of the fate and toxicology of chemicals in the agricultural environment

*3. Symposium on isotopes and radiation techniques in soil physics, irrigation and drainage problems

4. Regional seminar on the application of isotopes and radiation in investigations of fertilizer and water use efficiency for Middle East countries

Life sciences

*5. Symposium on radioimmunoassay and related procedures in clinical medicine and research

6. Symposium on recent advances in high energy particle dosimetry

7. Symposium on advances in dosimetry of high intensity and pulsed radiation fields

*8. Symposium on the effect of neutron irradiation on cell functions

9. Symposium on synergism in the biological effects of ionizing radiation and environmental pollutants

Physical sciences

*10. Third symposium on physics and chemistry of fission

11. Study group on nuclear science in sub-Saharan Africa

*12. Symposium on the collection, compilation, indexing, evaluation and distribution of nuclear data

*13. Symposium on new developments in labelled compounds, including radiopharmaceuticals

14. Study group on analytical control of radiopharmaceuticals

15. Study group on neutron activation analysis

16. Symposium on neutron radiography

17. Symposium on the use of nuclear techniques in petroleum and petrochemical industries

18. Study group on the design of irradiators for industrial processing

International Centre for Theoretical Physics

19. Two topical meetings on condensed matter physics

20. Seminar on atomic physics

21. Three topical meetings in high-energy physics

22. Seminar on the physics of oceans and atmosphere

Nuclear power and reactors

*23. Symposium on heavy-water reactors and/or high-temperature reactors

*24. Symposium on fuelling of nuclear power plants

*25. Symposium on operating experience with nuclear power plants

26. Study group on the techniques of project management for nuclear power plants

27. Study group on application of non-destructive techniques in nuclear technology

*28. Symposium on nuclear power plant control and instrumentation

*29. Symposium on fuel and fuel elements for fast breeder reactors

30. Study group on nuclear power desalting in the Middle East, or
Study group on research reactor utilization in Asia and the Far East

Nuclear safety and environmental protection

*31. Symposium on environmental monitoring at nuclear facilities, or
Symposium on radiological monitoring within nuclear establishments, or
Symposium on radiological safety problems in the handling of transuranium elements

32. Seminar on the protection of the public in the event of radiation accidents (jointly with WHO, FAO and possibly ILO)

33. Symposium on atmospheric transport of radioactive materials.

*34. Symposium on environmental behaviour of radionuclides released in the nuclear industry

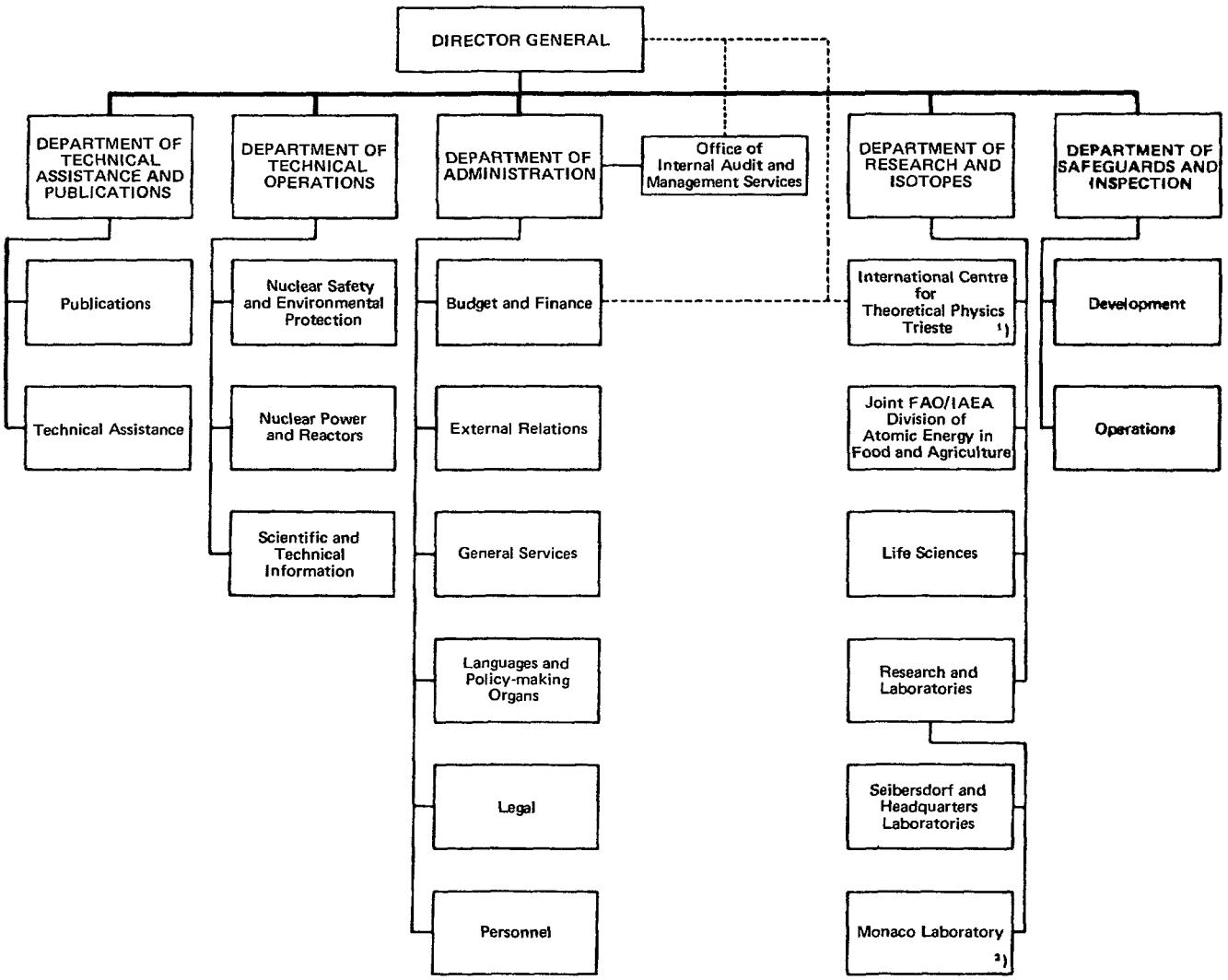
*35. Symposium on the principles and standards of reactor safety

36. Regional study group meeting on safety and environmental protection

Information and technical services

*37. Seminar on subject indexing for INIS

ORGANIZATIONAL CHART



1) Jointly operated by the Agency and UNESCO.
2) With the increasing participation of UNESCO and FAO.

ANNEX IV

THE MANNING TABLE

Changes in 1972

Table 1

	DG	DDG or IG	D	P-5	P-4	P-3	P-2	P-1	Sub-total	GS	M&O	Grand total
Department of Administration												
Office of Internal Audit and Management	-	-	-	-	-	-	1	(1)	-	-	-	-
Division of Budget and Finance	-	-	-	2	(1)	-	-	-	1	3	-	4
Division of General Services	-	-	-	-	-	-	(1)	-	(1)	(1)	2	-
Division of External Relations	-	-	-	1	4	3	2	-	10	11	-	21
Division of Languages and Policy-making Organs	-	-	2	5	14	28	1	-	50	41	1	92
(Languages Division)	-	-	(1)	(4)	(10)	(23)	(1)	-	(39)	(37)	(1)	(77)
Legal Division	-	-	-	-	(1)	-	-	-	(1)	-	-	(1)
(Division of Public Information)	-	-	-	(1)	(2)	(1)	(1)	-	(5)	(7)	-	(12)
Secretariat of the General Conference and the Board of Governors	-	-	(1)	(1)	(4)	(6)	-	-	(12)	(4)	-	(16)
Sub-total	-	-	-	2	-	1	1	(1)	3	6	2	11
Department of Research and Isotopes												
Deputy Director General's Office	-	-	-	(1)	-	-	-	-	(1)	(3)	-	(4)
Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture	-	-	-	-	-	-	-	1	1	-	-	1
Division of Life Sciences	-	-	-	-	-	-	-	-	-	(1)	-	(1)
Division of Research and Laboratories	-	-	-	-	-	-	-	-	-	1	-	1
Sub-total	-	-	-	(1)	-	-	-	1	-	(3)	-	(3)
Operational Facilities												
International Centre for Theoretical Physics	-	-	-	-	-	-	-	-	-	-	(2)	(2)
Sub-total	-	-	-	-	-	-	-	-	-	-	(2)	(2)
Department of Safeguards and Inspection	-	-	-	-	2	-	-	(1)	1	-	-	1
Division of Development	-	-	-	-	3	(2)	-	(1)	-	-	-	-
Division of Operations	-	-	-	-	(5)	2	-	2	(1)	-	-	(1)
Sub-total	-	-	-	-	-	-	-	-	-	-	-	-
Department of Technical Assistance and Publications												
Division of Publications	-	-	-	-	-	1	(1)	-	-	-	-	-
Sub-total	-	-	-	-	-	1	(1)	-	-	-	-	-
Department of Technical Operations												
Division of Scientific and Technical Information	-	-	-	(1)	-	(2)	-	-	(3)	(3)	-	(6)
Sub-total	-	-	-	(1)	-	(2)	-	-	(3)	(3)	-	(6)
TOTAL	-	-	-	-	-	-	-	-	-	-	-	-

1972 Revised

Table 2

	DG	DDG or IG	D	P-5	P-4	P-3	P-2	P-1	Sub-total	GS	M&O	Grand total
Office of the Director General	1	-	1	1	-	-	1	-	4	4	-	8
Department of Administration	-	1	-	1	-	-	-	1	3	2	-	5
Office of Internal Audit and Management	-	-	-	1	1	2	1	-	5	4	-	9
Division of Budget and Finance	-	-	1	4	3	1	2	5	16	28	-	44
Division of General Services	-	-	1	1	2	3	-	1	8	55	108	171
Division of External Relations	-	-	3	5	5	3	3	1	20	21	-	41
Division of Languages and Policy-making Organs	-	-	2	5	14	28	1	-	50	41	1	92
Legal Division	-	-	1	2	2	2	1	-	8	5	-	13
Division of Personnel	-	-	1	3	2	3	1	-	10	22	-	32
Department of Research and Isotopes	-	1	-	-	-	-	1	-	2	2	-	4
Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture	-	-	-	4	7	-	-	1	12	8	-	20
Division of Life Sciences	-	-	1	4	6	1	-	2	14	9	-	23
Division of Research and Laboratories	-	-	1	5	6	8	2	1	23	16	-	39
The Agency's Laboratory	-	-	-	5	11	7	6	1	30	53	21	104
The Monaco Laboratory	-	-	-	1	3	-	-	2	6	12	-	18
International Centre for Theoretical Physics	-	-	-	1	1	1	1	-	4	15	-	19
Department of Safeguards and Inspection	-	1	-	1	2	-	1	-	5	5	-	10
Division of Development	-	-	1	7	9	4	1	-	22	9	-	31
Division of Operations	-	-	1	12	17	22	12	2	66	19	-	85
Department of Technical Assistance and Publications	-	1	-	-	-	1	1	-	3	6	-	9
Division of Technical Assistance	-	-	1	6	8	2	1	-	18	24	-	42
Division of Publications	-	-	1	1	1	5	4	4	16	82	25	123
Department of Technical Operations	-	1	-	-	-	1	-	1	3	2	-	5
Division of Nuclear Safety and Environmental Protection	-	-	1	7	6	2	-	-	16	11	-	27
Division of Nuclear Power and Reactors	-	-	1	11	6	3	2	-	23	13	-	36
Division of Scientific and Technical Information	-	-	1	2	8	7	6	8	32	49	-	81
TOTAL	1	5	19	90	120	106	48	30	419	517	155	1091

Changes for 1973

Table 3

	DG	DDG or IG	D	P-5	P-4	P-3	P-2	P-1	Sub-total	GS	M&O	Grand total
Division of General Services	-	-	-	-	-	-	1	(1)	-	-	-	-
Division of Languages and Policy-making Organs	-	-	-	-	4	(4)	-	-	-	-	-	-
Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture	-	-	-	1	(1)	1[a/]	-	(1)[a/]	-	-	-	-
Division of Operations (Safeguards)	-	-	-	(2)	-	-	(2)	(2)	(6)	-	-	(6)
Division of Publications	-	-	-	-	-	-	-	-	-	1	-	1
Division of Scientific and Technical Information	-	-	-	-	-	-	1	(1)	-	-	-	-
TOTAL	-	-	-	(1)	3	(3)	-	(5)	(6)	1	-	(5)

a/ Upgrading to P-3 level of an existing P-1 post for Food Irradiation Project; the cost of the post is reimbursed to the Agency.

1973

Table 4

	DG	DDG or IG	D	P-5	P-4	P-3	P-2	P-1	Sub-total	GS	M&O	Grand total
Office of the Director General	1	-	1	1	-	-	1	-	4	4	-	8
Department of Administration	-	1	-	1	-	-	-	1	3	2	-	5
Office of Internal Audit and Management	-	-	-	1	1	2	1	-	5	4	-	9
Division of Budget and Finance	-	-	1	4	3	1	2	5	16	28	-	44
Division of General Services	-	-	1	1	2	3	1	-	8	55	108	171
Division of External Relations	-	-	3	5	5	3	3	1	20	21	-	41
Division of Languages and Policy-making Organs	-	-	2	5	18	24	1	-	50	41	1	92
Legal Division	-	-	1	2	2	2	1	-	8	5	-	13
Division of Personnel	-	-	1	3	2	3	1	-	10	22	-	32
Department of Research and Isotopes	-	1	-	-	-	-	1	-	2	2	-	4
Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture	-	-	-	5	6	1	-	-	12	8	-	20
Division of Life Sciences	-	-	1	4	6	1	-	2	14	9	-	23
Division of Research and Laboratories	-	-	1	5	6	8	2	1	23	16	-	39
The Agency's Laboratory	-	-	-	5	11	7	6	1	30	53	21	104
The Monaco Laboratory	-	-	-	1	3	-	-	2	6	12	-	18
International Centre for Theoretical Physics	-	-	-	1	1	1	1	-	4	15	-	19
Department of Safeguards and Inspection	-	1	-	1	2	-	1	-	5	5	-	10
Division of Development	-	-	1	7	9	4	1	-	22	9	-	31
Division of Operations	-	-	1	10	17	22	10	-	60	19	-	79
Department of Technical Assistance and Publications	-	1	-	-	-	1	1	-	3	6	-	9
Division of Technical Assistance	-	-	1	6	8	2	1	-	18	24	-	42
Division of Publications	-	-	1	1	1	5	4	4	16	83	25	124
Department of Technical Operations	-	1	-	-	-	1	-	1	3	2	-	5
Division of Nuclear Safety and Environmental Protection	-	-	1	7	6	2	-	-	16	11	-	27
Division of Nuclear Power and Reactors	-	-	1	11	6	3	2	-	23	13	-	36
Division of Scientific and Technical Information	-	-	1	2	8	7	7	7	32	49	-	81
TOTAL	1	5	19	89	123	103	48	25	413	518	155	1086

1974

Table 5

	DG	DDG or IG	D	P-5	P-4	P-3	P-2	P-1	Sub-total	GS	M&O	Grand total
Office of the Director General	1	-	1	1	-	-	1	-	4	4	-	8
Department of Administration	-	1	-	1	-	-	-	1	3	2	-	5
Office of Internal Audit and Management	-	-	-	1	1	2	1	-	5	4	-	9
Division of Budget and Finance	-	-	1	4	3	1	2	5	16	28	-	44
Division of General Services	-	-	1	1	2	3	1	-	8	58	113	179
Division of External Relations	-	-	3	5	5	3	3	1	20	21	-	41
Division of Languages and Policy-making Organs	-	-	2	5	18	24	1	-	50	41	1	92
Legal Division	-	-	1	2	2	2	1	-	8	5	-	13
Division of Personnel	-	-	1	3	2	3	1	-	10	22	-	32
Department of Research and Isotopes	-	1	-	-	-	-	1	-	2	2	-	4
Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture	-	-	-	5	6	1	-	-	12	8	-	20
Division of Life Sciences	-	-	1	4	6	1	-	2	14	9	-	23
Division of Research and Laboratories	-	-	1	5	6	8	2	1	23	16	-	39
The Agency's Laboratory	-	-	-	5	11	7	6	1	30	53	21	104
The Monaco Laboratory	-	-	-	1	3	-	-	2	6	12	-	18
International Centre for Theoretical Physics	-	-	-	1	1	1	1	-	4	15	-	19
Department of Safeguards and Inspection	-	1	-	1	2	-	1	-	5	5	-	10
Division of Development	-	-	1	7	9	4	1	-	22	9	-	31
Division of Operations	-	-	1	11	20	29	19	-	80	22	-	102
Department of Technical Assistance and Publications	-	1	-	-	-	1	1	-	3	6	-	9
Division of Technical Assistance	-	-	1	6	8	2	1	-	18	24	-	42
Division of Publications	-	-	1	1	1	5	4	4	16	83	26	125
Department of Technical Operations	-	1	-	-	-	1	-	1	3	2	-	5
Division of Nuclear Safety and Environmental Protection	-	-	1	7	6	2	-	-	16	11	-	27
Division of Nuclear Power and Reactors	-	-	1	11	6	3	2	-	23	13	-	36
Division of Scientific and Technical Information	-	-	1	2	8	7	7	7	32	51	-	83
TOTAL	1	5	19	90	126	110	57	25	433	526	161	1120

ANNEX V

Draft resolutions

A. REGULAR BUDGET APPROPRIATIONS FOR 1973

The General Conference,

Accepting the recommendations of the Board of Governors relating to the Regular Budget of the Agency for 1973 [1],

1. Appropriates an amount of $18 127 000 for the Regular Budget expenses of the Agency in 1973, as follows:

Section		United States dollars
1.	Policy-making organs	785 000
2.	Executive management and administration [2]	3 194 000
3.	Common services	3 124 000
4.	Technical assistance and training	775 000
5.	Research and isotopes [3]	2 408 000
6.	Operational facilities [4]	1 864 000
7.	Technical operations [5]	3 379 000
8.	Safeguards	2 598 000
	TOTAL	18 127 000

2. Decides that the foregoing appropriation shall be financed as follows:

(a) $1 182 000 from miscellaneous income, including refunds from the United Nations Joint Staff Pension Fund;

(b) $195 000 from the Special Account of the United Nations; and

(c) $16 750 000 from contributions by Member States on the basis of a scale of assessments to be determined by the General Conference;

3. Authorizes the Director General:

(a) In respect of the Laboratory, publications, research contracts and services provided to Member States or international organizations, to incur expenditures additional to those for which provision is made in the Regular Budget for 1973 provided that the relevant emoluments of the staff

concerned and other costs are entirely financed from revenues arising out of sales, work performed for Member States or international organizations, research grants, special contributions or other sources extraneous to the Regular and Operational Budgets for 1973; and

(b) With the prior approval of the Board, to make transfers between any of the Sections listed in paragraph 1 above.

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[1] GC(XVI)/485.

[2] Comprising Executive management and technical programme planning, Administration and Service and support activities.

[3] Comprising Food and agriculture, Life sciences and Physical sciences.

[4] Comprising the Laboratory, the International Centre for Theoretical Physics and the International Laboratory of Marine Radioactivity.

[5] Comprising Nuclear power and reactors, Nuclear safety and environmental protection and Information and technical services.

B. OPERATIONAL BUDGET ALLOCATIONS FOR 1973

The General Conference,

(a) Accepting the recommendations of the Board of Governors relating to the Agency's operational programme for 1973 [1], and

(b) Noting that funds from various sources, estimated at $741 000, are expected to be available for that programme,

1. Decides that for 1973 the target for voluntary contributions to the General Fund shall be $3 million;

2. Urges all Member States to make voluntary contributions to the General Fund for 1973 in accordance with Article XIV.F of the Statute, with paragraph 2 of its Resolution GC(V)/RES/100 as amended by Resolution GC(XV)/RES/286 and with paragraph 3 of the former Resolution, so that this target may be reached;

3. Allocates the following sums for the Agency's operational programme for 1973:

	United States dollars
Operating Fund I	596 000
Operating Fund II	3 145 000
	3 741 000

4. Authorizes the Director General to employ staff and incur other expenditures for the International Laboratory of Marine Radioactivity or for the International Centre for Theoretical Physics in addition to that for which provision is made in the Operational Budget for 1973, provided that the total emoluments of such staff and other costs are met from revenues arising out of work performed for Member States or international organizations, research grants, special contributions or other sources extraneous to the Regular and Operational Budgets for 1973.

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[1] GC(XVI)/485.

C. THE WORKING CAPITAL FUND IN 1973

The General Conference,

Accepting the recommendations of the Board of Governors relating to the Agency's Working Capital Fund in 1973[1],

1. Approves a level of $2 million for the Agency's Working Capital Fund in 1973;

2. Decides that the Fund shall be financed, administered and used in 1973 in accordance with the relevant provisions of the Agency's Financial Regulations[2];

3. Authorizes the Director General to make advances from the Fund:

   (a) Not exceeding $25 000 at any time, to finance temporarily projects or activities of a strictly self-liquidating character which will not necessitate an increase in the Fund in future years; and

   (b) With the prior approval of the Board of Governors, unless in his opinion the situation requires immediate action before such approval can be obtained, to meet the cost incurred by the Agency in organizing and rendering emergency assistance to Member States in connection with radiation accidents, up to $50 000 in each case; and

4. Requests the Director General to submit to the Board periodic statements of advances made from the Fund under the authority given in paragraph 3 above.

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[1] GC(XVI)/485, para. I. 30.
[2] INFCIRC/8/Rev. 1 and Mod. 1.