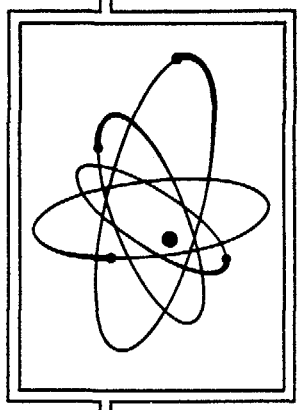
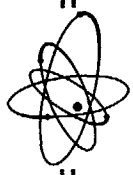


International Atomic Energy Agency

ANNUAL REPORT TO THE ECONOMIC AND SOCIAL COUNCIL OF THE UNITED NATIONS FOR 1959-60

Vienna, May 1960



International Atomic Energy Agency

ANNUAL REPORT TO THE ECONOMIC AND SOCIAL COUNCIL OF THE UNITED NATIONS FOR 1959-60

INFCIRC/17
Vienna, May 1960

THE AGENCY'S ANNUAL REPORT TO THE ECONOMIC AND SOCIAL COUNCIL OF THE UNITED NATIONS FOR 1959-60

By resolution GC(III)/RES/41 the General Conference authorized the Board of Governors to submit the Agency's annual report to the Economic and Social Council of the United Nations for the year 1959-60 to the Council. The text of that report, which was approved by the Board on 30 March 1960, is reproduced in this document for the information of Member States.

ANNUAL REPORT BY THE INTERNATIONAL ATOMIC ENERGY AGENCY TO THE ECONOMIC AND SOCIAL COUNCIL FOR 1959-60

(For the period 16 April 1959 - 15 April 1960)

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ANNEXES

List of Abbreviations

ACC	Administrative Committee on Co-ordination
Agency	International Atomic Energy Agency
CCAQ	Consultative Committee on Administrative Questions
CCPI	Consultative Committee on Public Information
CCTA	Commission for Technical Co-operation in Africa South of the Sahara
CERN	European Organization for Nuclear Research
ECA	United Nations Economic Commission for Africa
ECAFE	United Nations Economic Commission for Asia and the Far East
ECE	United Nations Economic Commission for Europe
ECLA	United Nations Economic Commission for Latin America
ECOSOC	Economic and Social Council of the United Nations
ENEA	European Nuclear Energy Agency of the Organisation for European Economic Co-operation
EPTA	United Nations Expanded Programme of Technical Assistance
EURATOM	European Atomic Energy Community
FAO	Food and Agriculture Organization of the United Nations
IANEC	Inter-American Nuclear Energy Commission of the Organization of American States
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ICRU	International Committee on Radiological Units and Measurements
ICSO	International Council of Scientific Unions
ILO	International Labour Organisation or International Labour Office
IMCO	Inter-Governmental Maritime Consultative Organization
ISO	International Organization for Standardization
OAS	Organization of American States
OEEC	Organization for European Economic Co-operation

List of Abbreviations (continued)

TAB	Technical Assistance Board
TAC	Technical Assistance Committee
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPU	Universal Postal Union
WHO	World Health Organization
WMO	World Meteorological Organization

INTRODUCTION

General

1. The following report is submitted to ECOSOC in pursuance of Council resolution 694 E (XXVI) and resolutions GC(II)/RES/24 and GC(III)/RES/41 of the General Conference of the International Atomic Energy Agency. [1]

2. In introducing this report the Board of Governors has the honour to recall to the Council's attention the fact that the Agency also submits an annual report to the General Assembly. The last such report covered the period from 1 July 1958 to 30 June 1959, and also included brief references to developments in the Agency's work up to the end of the third regular session of the General Conference, i.e. 2 October 1959. In the present report the Board has therefore concentrated on those aspects of the Agency's work that would appear to be of particular interest to the Council, bearing in mind the latter's special responsibility for co-ordinating the activities of the United Nations family in the economic and social fields.

An outline of the Agency's work in 1959-60

3. While much of the Agency's report to ECOSOC last year consisted of plans for future activities, the present document is mainly a record of work done, projects already under way and a steady growth in most of the Agency's programmes. [2] The latter can be grouped into two categories: work undertaken in the interests of the Agency's membership as a whole and work done for the benefit of individual Member States, particularly those in the less developed areas.

4. The following are examples of the Agency's work in the interests of its membership as a whole:

(a) It held its first two large scientific conferences: one on the application of large radiation sources in industry (Warsaw) and the other on the disposal of radioactive waste (Monaco [3]). These were the first international scientific meetings to be held on the subjects in question and proved valuable to their sponsors in planning their future activities and, in the case of the meeting in Monaco, by focusing international attention on problems of world-wide interest and growing magnitude; [4]

(b) In addition to the small "provisional" laboratory already in operation at Headquarters, the foundations of the Agency's main functional laboratory near Vienna were laid in October 1959. When construction is completed, the Agency will be able to provide a number of new scientific services to its Member States, particularly to those in the less developed areas, and to offer a limited amount of training with its own facilities;

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[1] In resolution 694 E (XXVI) the hope was expressed that the Agency would find it appropriate to submit reports annually to the Council at its second session on matters within the Council's competence. The General Conference decided that such annual reports would be submitted and authorized the Board of Governors to submit this report in 1959 (GC(II)/RES/24). The Board was again authorized to submit the report in 1960 (GC(III)/RES/41).

[2] In this connexion, appreciation is expressed for the invaluable advice on the Agency's programmes and activities which is being given to the Director General and the Board by the Scientific Advisory Committee.

[3] This conference was co-sponsored by UNESCO and held in close co-operation with FAO.

[4] For other scientific meetings already held, or planned, see Annexes C and D.

(c) During the period under review, the first main scientific directories of the Agency were published and the range and volume of other scientific and technical works also grew considerably. The Agency's programme of research contracts and other work to promote research in the nuclear sciences also got well under way;

(d) The concern felt throughout the world about the hazards of radiation has made it desirable to broaden and accentuate the Agency's work in this field. The Agency is now developing a comprehensive series of safety regulations covering the use of radioisotopes, the transport of radioactive substances, the operation of reactors and the containment and disposal of nuclear wastes by land and sea. Much of the scientific research promoted by the Agency has also been concerned with radiation problems; thus 29 of the 40 research contracts awarded in 1959 have been in this domain;

(e) In the same context, the Agency has introduced novel arrangements for the evaluation by international groups of experts of the hazards of nuclear installations. The first plant for which such an evaluation was made was the Diorit reactor in Switzerland. Since then, there have been further requests from the Swiss Atomic Energy Authorities and several enquiries or requests from other Member States;

(f) In January 1960 the Board agreed that, within certain limits, and in co-operation with the competent United Nations authority, the Agency's laboratory should, at the request of a Member State or of an international organization in relation with the Agency, undertake the measurement and analysis of samples to determine the degree of environmental contamination by radioactivity; and

(g) The legal problems presented by radiation hazards have also received close attention. A draft international convention dealing with civil liability for accidents in land-based installations was completed, and work begun in connexion with a similar convention for nuclear shipping.

5. Of equal importance has been the steady expansion of the Agency's work in giving direct assistance to individual Member States, particularly in the less developed areas. The fellowship and exchange programme launched in 1958 has continued to grow, 210 fellowships having been granted in 1958, 356 in 1959 and 378 already in 1960. The Agency is meeting requests from 23 countries for 65 experts and is supplying equipment to 17 countries. In this connexion the Board has recognized that the introduction of the relatively costly and complex technologies of nuclear science into the economies of less developed countries, often short of both capital and scientific manpower, should be undertaken with care. To assist Member States in the planning or expansion of their atomic energy programmes, special composite missions have been sent to (or are at present visiting) 36 countries. The Agency is also giving assistance in the form of contracts specially designed to promote nuclear research on the scientific and technical problems of the less developed areas.

6. One of the main statutory functions of the Agency is to encourage the development of nuclear power and to facilitate the supply of nuclear fuels and equipment. The Agency's first fuel supply project (to Japan) was reported to the Council last year and it has since been followed by a request from Finland for Agency assistance in obtaining a Triga Mark II reactor, the fuel for this reactor and the fuel for a critical assembly. The Agency has also decided to participate in an intensive study, jointly with the Finnish Government, regarding the possible introduction of nuclear power into Finland. Enquiries have also been made by Austria and Tunisia concerning a supply of enriched uranium and by Australia for a small quantity of nuclear-grade beryllium.

7. In the past year there has been some reconsideration of plans for the development or expansion of nuclear power. Several factors have played a part in this reassessment. The ratio of known oil reserves to the annual production of oil has continued to grow; there have been increases in efficiency and a decline in the capital costs of conventional plants and in some parts of the world the price of coal has fallen.

8. The development of the new technology of generating power from nuclear energy must however be expected to present numerous practical problems, the solution of which will depend upon progress in quite separate branches of science and industry. Thus new advances in metallurgy or electronics in the next few years may result in important economies

in the production of nuclear power (a decline in the cost of nuclear fuels is also possible). If there has been some deferment of short-term expectations it is probably because earlier appraisals under-estimated the seriousness of the technological problems and were unduly influenced by transient economic and political factors. As far as the long-term outlook is concerned, the need for atomic energy as a source of power remains as great as ever. In the meantime, the Agency's work in this field necessarily consists, for the most part, of helping its Member States to prepare for the eventual introduction of nuclear power and takes the form of training and exchange programmes, scientific meetings, publications and other means of promoting the exchange of information, broad or intensive surveys and studies and activities to ensure the safety of workers and of the general public.

I. EXTERNAL RELATIONS OF THE AGENCY

A. Relations with the United Nations

9. The annual report of the Agency, covering the period from 1 July 1958 to 30 June 1959, was presented to the General Assembly at its fourteenth session by the Director General and was discussed in plenary meetings on 3 November 1959. The Agency was also represented at the twenty-ninth session of ECOSOC and at various other meetings of organs of the United Nations.

10. One of the main subjects of joint interest to the Agency and the United Nations is radiation protection and some of the arrangements for co-operation in this sphere have been referred to in the introduction. In addition, the Agency, together with the interested specialized agencies, is undertaking a number of studies on behalf of UNSCEAR, the comprehensive report of that body having itself served as a valuable guide for the Agency's research in this field. The Agency and the United Nations also both have a major interest in the economics of electric power production. Under working arrangements with the United Nations, the Agency is concentrating its studies on the costing of nuclear power and the United Nations secretariat on the cost of power from conventional sources. Since these studies are complementary, close and frequent consultation is being maintained between the two bodies.

11. Greater emphasis has been placed, in the last year, on relations with the regional economic commissions of the United Nations in order to familiarize Governments of countries in the less developed areas with the Agency's programme. Thus, for the first time, the Agency was represented at the eighth session of ECLA and at the second session of ECA. Representatives of the Agency also attended the fourteenth session of ECE, the seventh session of the Sub-Committee on Electric Power of ECAFE, and the sixth session of the Committee for Co-ordination and Investigations of the Lower Mekong Basin.

12. The United Nations for its part has co-operated closely in the work of the Agency through the permanent representative of the Secretary-General at the Agency's headquarters as well as by special representation at the third regular session of the General Conference and at various panels and committees of the Agency.

13. A number of specific requests have been made to the Agency by organs of the United Nations. Thus, the Agency contributed a study on the main trends of enquiry in research on, and development and applications of, nuclear energy for peaceful ends to the survey being undertaken by the United Nations, UNESCO and other specialized agencies on the main trends of enquiry in fields of natural sciences pursuant to General Assembly resolution 1260 (XIII). The Agency also participated in the survey of international relations and exchanges in the fields of education, science and culture which was prepared by UNESCO in co-operation with the United Nations and certain specialized agencies, in implementation of Council resolution 695 (XXVI). In response to Council resolution 743 D II (XXVIII) the Agency submitted a statement giving information on its future programme to the Council Committee on Programme Appraisals.

14. Other action taken by the Agency in response to specific requests made to it by organs of the United Nations is described under the appropriate subject headings below.

B. Participation in EPTA and relations with the Special Fund

15. It will be recalled that the Agency participated in EPTA for the first time in 1959. The details of this participation are referred to below, but it may be noted here, that it has already enabled the Agency to co-ordinate its work more closely with that of the other participating organizations which are concerned with one or more aspects of the peaceful uses of atomic energy. This co-ordination will be developed further by the full participation in the country programming procedures of EPTA in which the Agency will take part for the first time in 1960.

16. The Agency was represented at the second and third sessions of the Governing Council of the Special Fund. Consultations are proceeding concerning the form and content of agreements between the Fund and the Agency, whereby the Fund would appoint the Agency the executing agency for projects involving the peaceful uses of nuclear energy, with the object of avoiding any procedural delay when the situation arises.

C. Participation in the work of ACC

17. The Director General attended both sessions of ACC in 1959 and the Agency was represented at all meetings of the Preparatory Committee.

18. In view of its primary responsibility, the Agency was especially concerned with the devising of inter-agency arrangements made under the guidance of ACC, with a view to co-ordinating, within the United Nations family, activities related to the peaceful uses of atomic energy. ACC itself will report in detail on these questions to the Council. The various arrangements made and the combined efforts which they have brought about are therefore referred to only incidentally in this report. Mention may be made, however, of the invitation which ACC has extended to the Agency to report periodically - on the basis of an exchange of information on programmes - on the combined activities of the United Nations family in this field. This step may well prove to be of particular value, since it will provide the basis on which recommendations can be made whenever necessary for intensification of effort in certain areas, for the initiation of new projects, or for new arrangements for co-ordination. It is believed that this procedure will help to ensure that the resources available to the United Nations organizations for this work will be used to the best advantage.

19. The Agency is also participating in certain subsidiary bodies of ACC such as CCAQ and CCPI.

D. Relations with the specialized agencies

20. The relationship agreements with WHO, WMO and FAO, referred to in the first report to the Council, came into force on 28 May, 12 August and 19 November 1959 respectively. A relationship agreement with ICAO was approved by the Council of that organization on 28 September 1959, and came into force, on its approval by the General Conference of the Agency, on 1 October 1959. The Agency has therefore now concluded six agreements with specialized agencies, those with ILO and UNESCO having come into force in 1958. Although no formal agreement has as yet been negotiated with IMCO, the two organizations are in close touch with each other on questions of mutual interest, such as nuclear ship propulsion, radioactive waste disposal at sea and the transport of radioactive materials.

21. Pursuant to these agreements, the Agency and the specialized agencies have been represented at numerous meetings of each other's governing organs or conferences. As will be seen below, and as will be reported by ACC, various arrangements have also been made for the joint holding of scientific meetings, training courses and other projects between the Agency on the one hand and ILO, FAO, UNESCO and WHO on the other. All these agencies, as well as ICAO, WMO and UPU have taken part in the work of Agency panels.

E. Relations with inter-governmental organizations outside the United Nations framework and with non-governmental organizations

22. A number of regional inter-governmental organizations outside the United Nations framework are closely concerned with various aspects of the peaceful uses of atomic energy, and their work on subjects of interest to the Agency has grown rapidly. As in former years, observers from ENEA, EURATOM, CCTA, CERN, the Joint Institute for Nuclear Research and IANEC were invited by the Board, in pursuance of the authority given it by the General Conference, to attend the third regular session of the General Conference. The Board has authorized co-operation with these organizations at the secretariat level and there is now a considerable amount of information being exchanged on matters of mutual interest particularly on questions related to health and safety. In a number of cases the

Agency and the bodies concerned have been represented at each other's technical meetings, panels and working groups. The Agency, for example, participated in the symposium on technical methods in health physics which was convened by ENEA in May 1959, and it was represented at a meeting on automatic documentation held by EURATOM in February 1960 and at an Inter-American Symposium on the Peaceful Application of Nuclear Energy, which was held in 1959, under the auspices of OAS.

23. The Agency also co-operates on technical matters with other inter-governmental organizations whose work touches only incidentally on the field of activities of the Agency. Thus, for instance, in elaborating recommendations on the transport of radioactive materials, the Agency co-operates with such bodies as the European Conference of Ministries of Transport, the Customs Co-operation Council, the International Bureau of Weights and Measures and the Central Office for International Railway Transport.

24. As far as relations with non-governmental organizations are concerned, the Agency, following the practice of ECOSOC, has established machinery for granting consultative status. This has now been given to the following organizations, nine of which were represented at the third regular session of the General Conference: the International Chamber of Commerce, the International Commission on Radiological Protection, the International Confederation of Free Trade Unions, the International Co-operative Alliance, the International Federation of Christian Trade Unions, the International Organization for Standardization, the International Union of Producers and Distributors of Electrical Energy, the World Federation of United Nations Associations, the World Power Conference, the International Union for Inland Navigation, the International Commission on Radiological Units and Measurements, and the International Council of Scientific Unions. Several other applications for consultative status are still pending.

II. THE AGENCY'S WORK IN TECHNICAL FIELDS OF INTEREST TO THE COUNCIL

A. The supply of materials and nuclear fuels, and the development of nuclear power

1. Nuclear power

25. Under the terms of its Statute, the Agency has well defined and specific tasks in regard to the supply of nuclear fuels for reactors of all types (research, training, materials testing and power) and these activities are dealt with separately in paragraphs 39 - 45 below.

26. As far as nuclear power as a whole is concerned, however, the Agency's responsibilities are of a more general nature and special emphasis is being given in the early stages to both the technical and economic aspects of the subject with particular reference to the needs of the less developed countries. The Agency is continuing to collect, evaluate and transmit information on reactor development; to provide advice and assistance to Member States on their reactor programmes; to sponsor technical conferences, and to conduct exploratory surveys. As the introduction of nuclear power can only be considered within the context of a country's whole economy and in particular its conventional fuel and power resources, many of these activities are being carried out in close co-operation with the United Nations.

27. The first and second volumes of a Directory of Nuclear Reactors, covering power and research reactors respectively, were published in June and December 1959. Additional information is being collected on research reactors and it is planned to publish a third volume of the directory in 1960, whereas another volume on experimental and test reactors, including new types of power reactors, is in the course of preparation, for publication in 1961.

28. It will be recalled that, at its second regular session, the General Conference adopted resolution GC(II)/RES/27 on the subject of assistance to less developed countries in connexion with the development of nuclear power. [5] The General Conference recommended, amongst other things, that consideration be given to initiating a survey of the needs of the less developed countries, with their consent, in the matter of nuclear power generation plants suitable for their specific circumstances, and that a continuing study be made of the development of the technology and economics of small and medium scale nuclear power reactors best suited for the economic development of less developed countries.

29. At its third regular session the General Conference approved a programme for this work proposed by the Board of Governors. It also adopted resolution GC(III)/RES/57 making certain recommendations which had the effect of broadening the Agency's studies to embrace the economics of "nuclear power" rather than only of "small and medium scale nuclear power reactors". A wider category of countries was also to be included in the programme.

30. In pursuance of these resolutions studies are being undertaken of:

(a) Different types of power reactors with special reference to the present state of their development, the prospects for future development and the available operating experience; and

(b) Technical requirements for power reactors including suitability for use in less developed areas.

31. In carrying out these studies use is being made both of questionnaires and of visits by small teams of Agency experts to collect material on the spot. Information is being sought from countries which have already built reactors, on types which have been designed, those that can now be supplied, and in particular those that would be suitable for less developed countries.

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[5] See paragraphs 28 - 38 of the Agency's report to the Council for 1958-59 (United Nations document E/3248).

32. Similarly, information is being collected on the operating costs and performance of reactors already in operation. In addition the United States of America has proposed that the Agency should participate directly in the work of designing, constructing and bringing into operation a small prototype reactor of pressurized-water type potentially suitable for use by the less developed countries. Consideration is being given to the arrangements for such participation.

33. The programme includes a survey of nuclear power costing with particular reference to the less developed countries. For this purpose a panel was called by the Agency in March 1960. Its task was to review the present knowledge of nuclear power costing, to study typical problems, to examine the advisability of developing a standardized costing procedure and to recommend further studies. The United Nations and IBRD took part in the panel's work in view of their general interest in questions related to power. A second meeting of the panel will be held later in the year.

34. A scientific conference on medium and small power reactors, with particular reference to the power needs of the less developed countries, will be held in Vienna from 5 - 9 September 1960. The United Nations and IBRD have been invited to participate. The following matters will be covered:

(a) Technical aspects of medium and small power reactors best suited for conditions in less developed countries, including considerations of technical feasibility, problems of design, construction, operation and maintenance, and integration into conventional power systems;

(b) Economics of nuclear power, including cost estimates of plant equipment and of other components, methodology of power cost estimates and application of nuclear power costing procedure to specific nuclear plants; and

(c) Economic aspects of medium and small power reactor needs in specific locations.

35. In the last few years, nuclear research reactors have been built in some 20 countries which had had no previous experience in this field. Experience has shown that in such cases initial difficulties are often encountered not only in planning research programmes, but also in manufacturing special tools and carrying out the research itself. Exchanges of information between the more and the less experienced nuclear centres would thus serve a most useful purpose.

36. As a first step to this end, the Agency is planning a symposium on neutron pile research, to be held in October 1960, with the main task of showing what is being and what could be done with small and medium sized reactors and how correlation of research in this field could be started.

37. The Agency has also begun economic studies of long range nuclear power development programmes in certain countries. The Board of Governors in January 1960, for example, approved a proposal for the Agency to collaborate in a study in Finland, initiated by the Government, to determine the extent to which nuclear power will be needed in the next decade, and the steps which must be taken for the realization of a nuclear power project if the need is shown.

38. The special power survey mission which was expected to visit Argentina in 1959 has been deferred until 1960. The Brazilian Government is at present engaged in the planning of a nuclear power plant, to be built at Mambucaba, and has requested the Agency to provide technical assistance in connexion with the project.

2. The supply of nuclear fuels (fissionable and source materials) and equipment

39. While all the functions of the Agency connected with the supply of fissionable and source materials are not of direct interest to the Council it is believed that some information on these activities should be given because of their economic implications.

40. For several reasons, some of which have been mentioned in the introduction, the Agency's role under this heading has up to now been limited. An important factor is that nuclear power has developed, to a significant extent, in a few industrially advanced countries only and in one or two other areas where special circumstances prevail. The

fuel-needs of most of these countries are served by domestic production, bilateral arrangements antedating the establishment of the Agency or by regional arrangements.

41. Materials which are available through the Agency include natural and enriched uranium under supply agreements with the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America. Substantial quantities of uranium chemical concentrates such as UO_2, UO_3, U_3O_8 and UF_4 have also been made available by Belgium, Canada, Portugal, Spain, the Union of South Africa and the United States. In addition, India has made thorium and its compounds available, while Ceylon has offered supplies of monazite.

42. The arrangements reported to the Council last year for the supply of three tons of natural uranium to Japan for use in a research reactor were completed and delivery was made in November 1959. [6]

43. In the course of the year the Finnish Government requested the Agency's assistance in obtaining a Triga Mark II reactor, the fuel for this reactor and the fuel for a critical assembly. The Agency has arranged for the reactor to be supplied from the United States and is at present negotiating with that Government and with the Soviet Union for the supply of the fuel for the reactor, which is uranium enriched to 20% (United States) and uranium enriched to 10% (Soviet Union) required for the critical assembly.

44. The Austrian Government has enquired concerning the availability of supplies of uranium enriched to 90% for its five-megawatt research reactor; Tunisia has also made an enquiry concerning enriched uranium, and Australia one about the supply of a small quantity of nuclear-grade beryllium. These enquiries are at present under consideration.

45. In assisting Member States to develop their programmes of applying atomic energy for peaceful uses, the Agency has provided various other types of equipment as well as technical advice and information with regard to special reactor materials, nuclear raw materials and the availability and suitability of the necessary equipment and instruments.

B. Contribution of the application of radioisotopes and radiation to economic and social development

46. The applications of radioisotopes and radiation to industry, medicine and agriculture will play a valuable role in the economic and social development of the less developed countries and already forms an important part of the Agency's technical assistance activities. These are dealt with in Chapter III below. The following paragraphs refer to headquarters activities and field work done by headquarters staff.

47. It is desirable that a comprehensive survey should be made of the information at present available with regard to both the well-established uses and potential applications of radioisotopes. In order to make the most effective use of its limited resources, however, the Agency's activities have been concentrated on a restricted number of specific problems having a close bearing on economic and social development.

48. A comprehensive International Directory of Radioisotopes has been published. The first volume contains complete tables of isotopes preparations, including unprocessed and processed isotopes and solid radiation sources for special applications, giving the most important physical data, information on the sources of supply, procedures for obtaining radioisotopes, as well as prices, in so far as they are available. The second volume gives similar information on chemical compounds labelled with carbon 14, hydrogen 3, iodine 131, phosphorus 32 and sulphur 35.

49. In regard to medical applications, emphasis has been given to radioisotope techniques and to radio teletherapy. General and specialized problems regarding medical radioisotope scanning and the use of radioisotopes in tropical diseases were discussed in a series of meetings organized in co-operation with WHO. In addition a study group was organized

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[6] United Nations document E/3248, paragraphs 43-47.

jointly with WHO to discuss problems related to the use of radioisotope teletherapy units and supervoltage radiation in radiotherapy. [7] This work was supplemented by the publication of an international directory on radioisotope teletherapy equipment, a bibliography on this subject and a survey on the present stage of development in those fields. Specialists have been supplied by the Agency to hospitals and institutions in Member States to advise on the installation and initial operation of radiocobalt teletherapy units.

50. Research contracts awarded by the Agency have included several on the use of isotopes in research on diseases such as goitre, parasitic infections and anemia which affect large parts of the population in tropical and sub-tropical countries.

51. The Agency has also encouraged research to find a cheaper method of producing the isotope calcium 47 which is of particular value in certain medical applications as well as in the study of the metabolism of certain fission products in the human body. A survey was made of the probable requirements for this isotope and small meetings of consultants were held to discuss various methods of production. As a result of these activities, calcium 47 is now commercially available at one fifth of its former price and further improvements in the supply situation can be expected.

52. The Agency's activities with regard to agriculture have followed the lines indicated in the report to the Council for 1958-59. [8] They have been mainly concerned with the application of radioisotopes in the investigation of fertilizers, and the use of radiation for the improvement of plant species. The Agency's survey missions visiting the less developed areas were able to advise on research programmes in connexion with these problems.

53. In July 1959 the Agency, by providing fellowships and lecturers, assisted the Massachusetts Institute of Technology at Cambridge, Massachusetts, in organizing a conference on the preservation of foods by ionizing radiations.

54. Research contracts awarded have included the evaluation of fertilizers by means of radioisotopes, and the improvement, by use of radiation treatment, of crops of large consumption such as rice, maize, wheat and tomatoes. In co-operation with FAO a study is being made of the information at present available on these subjects.

55. The Agency is keeping in close touch with the appropriate authorities in regard to national research projects related to food preservation by irradiation.

56. In the industrial application of radioisotopes the Agency is now able to give advice to less developed countries on such applications as thickness gauges, level metres, radiography units, electrostatic units and density metres, all of which are now used as a matter of routine in industrially advanced countries. A survey of existing industrial applications of radioisotopes is being planned.

57. In September 1959 the Agency convened a conference in Warsaw on the application of large radiation sources in industry with special emphasis on chemical processes. This provided a useful guide to the Agency's own work, as well as a comprehensive survey of the stage reached in the development of this promising new technique. It may be expected that radiation will be seen as a new source of energy for industry, especially in chemical processes as, for instance, the manufacture or modification of various plastics and more economical processing in the petroleum industry. ILO and FAO were represented at the conference as well as EURATOM, OEEC and ISO.

58. The Agency, in co-operation with UNESCO, is convening a conference on the use of radioisotopes in physical sciences and industry, to be held in Copenhagen in September of this year.

59. The potentiality of radioisotope tracer techniques in hydrology has also been surveyed. Studies of the application of radioisotopes to river basin development, including the

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[7] See also paragraph 18 above.

[8] United Nations document E/3248, paragraph 57.

properties of water bearing strata and the determination of the size of ground water reservoirs, for example, will have an important economic bearing in developing the less developed areas.

60. In this connexion, the Agency in October 1959 sent two experts - a hydrologist and an expert on radioisotope applications - to the Federation of Rhodesia and Nyasaland to study the possibility of introducing radioisotope techniques in the general development programme of the Sabi river area. Similarly, the Agency sent two experts in March 1960 to the Mekong River Basin area.

C. Protection against radiation

61. One of the important functions of the Agency under its Statute is the establishment or adoption of standards of safety for the protection of health.

62. The Agency has followed the practice of convening panels of experts to formulate recommendations and elaborate health and safety codes and manuals of practice on the basis of drafts prepared by its scientific secretariat. Other interested organizations are invited to participate thereby contributing their specialized competence to the work of the panel. As the result of the work of such a panel, and in consultation with ILO and WHO, the first of a series of safety manuals on the safe handling of radioisotopes was published in the course of 1959.

63. In response to the desire expressed by the Council in resolution 724 C (XXVIII), two panels, the work of which will be completed in 1960, were set up to draft recommendations on the transport of radioactive substances. One panel is dealing with the transportation of radioisotopes and radioactive ores and residues of low specific activity and the other with the transportation of large radioactive sources and fissile materials.

64. It will be recalled that the United Nations conference on the Law of the Sea which met in 1958, requested the Agency to undertake or promote the necessary international action in regard to the control of radioactive waste disposals into the sea. The Agency has devoted considerable attention to this subject and the question of regulations has been under intensive study by a panel of experts whose recommendations are expected to be available in 1960. In November 1959 the Agency and UNESCO co-sponsored a conference in Monaco on radioactive waste disposal in co-operation with FAO. It dealt primarily with the problems of disposal into the sea and geological structures and provided the first opportunity for an international exchange of views between oceanographers, fishery experts, geologists and atomic energy experts. A number of research contracts awarded or pending also deal with problems of marine waste disposal.

65. In addition to elaborating health and safety codes, regulations and manuals of practice, the Agency has provided technical advice to Member States in the less developed areas on the application of such health and safety regulations and the setting up of safety services.

66. The Agency has continued to co-operate with UNSCEAR, ICRP and ICRU in research on radiation effects and protection. Pursuant to the request made by the General Assembly (resolution 1376 (XIV)), special attention is being given to the support of research in fundamental radiobiology and by March 1960 27 research contracts had been awarded in that field. The chief investigators undertaking this research met in March in order to co-ordinate their work and to discuss experimental problems of common interest.

67. A study has been undertaken of the hazards arising from strontium 90 contamination of the biosphere. On the recommendation of the Scientific Advisory Committee, the results of the study will be considered by a panel of experts in the course of the year. It is expected that increased research activities will then be promoted in the experimental evaluation of the margin of safety in the currently accepted maximum permissible concentration of strontium 90 in the human body.

68. Following the recommendations of a special panel, and with the approval of the Board, the Agency, in co-operation with UNSCEAR, is planning to help its Member States by undertaking, at their request, and within certain limits, the measurement and analysis of samples to determine the degree of environmental contamination by radioactivity. The Agency's

functional laboratories, at the request of Member States, will perform measurements of environmental contamination, and a survey will be made of the procedures being followed in certain national laboratories with a view to promoting standardized procedures of sample collection and analysis.

69. A classification of various radionuclides in terms of the relative degree of hazard during transport has been prepared in connexion with the work of the panels on transportation.

70. In April 1960 the Agency and the Government of Yugoslavia, with the help of the atomic energy authorities of France, the United Kingdom and the United States arranged an elaborate dosimetry experiment to determine the precise effects of an accident that took place in the critical assembly at Vinca in October 1958; the results of this project are expected to shed further light on the medical treatment of heavy radiation exposures.

71. The Agency has also undertaken a considerable amount of work on the legal problems raised by radiation hazards. The draft of an international convention to deal with questions of civil liability for radiation accidents in land-based installations has been prepared by a panel of experts convened by the Director General in 1959. If the response of Member States warrants such a step, a convention may be opened for signature in 1961. A similar convention on questions of civil liability for damage which may be caused by nuclear-powered ships is now being considered by another panel of experts.

D. Exchange of information

72. During the period under review the Agency's work in the collection, exchange and diffusion of information on the peaceful uses of atomic energy has also increased considerably. Many of its publications, such as the manual on safe handling of radioisotopes and international directories of reactors and radioisotopes, have been referred to in previous chapters. In addition, the Agency has prepared a number of purely scientific publications, with the assistance of panels of experts, including one on physics of heavy water lattices and reactor constants, and is about to issue an international quarterly journal on fusion and plasma physics. Some 15 bibliographies were prepared on many topical aspects of the peaceful uses of atomic energy and the Agency has published and distributed to its Member States the proceedings of its scientific conferences and symposia. A list of its publications during the period under review is attached as Annex B.

73. The various scientific meetings and symposia held in 1959 and the Agency's plans for 1960 are described in Annexes C and D. In general it has been the Agency's experience that the major work of the first two United Nations International Conferences on the Peaceful Uses of Atomic Energy can effectively be taken further by smaller and more specialized scientific meetings in which groups of experts on a particular subject exchange the latest information and which afford plentiful opportunity for discussions. In certain cases it has been found useful to combine two or three widely differing scientific disciplines so as to ensure rounded discussions of the subject at issue and cross-fertilization of ideas (e.g. the discussions between atomic energy scientists and hydrographers on problems of waste disposal into the sea). In such instances co-operation of other agencies dealing with the non-atomic disciplines has proved very valuable. The question of the holding of a third international conference on the peaceful uses of atomic energy has also been considered by the Agency in response to the request of the General Assembly (resolution 1344 (XIII)) and on the basis of an evaluation of the second conference. It is understood that the Agency's conclusions will be reflected in the report to be submitted by the Secretary-General to the Assembly at its fifteenth session.

74. In close collaboration with the libraries of Member States and other organizations the Agency has also made a comprehensive collection of scientific publications and documents on the peaceful uses of atomic energy and is thus able to serve as a reference centre to Member States and other interested organizations for information and abstracting services on nuclear science. At the end of 1959 the Agency's library possessed 15 000 scientific and technical books and reports.

III. THE AGENCY'S TECHNICAL ASSISTANCE ACTIVITIES

75. In the period under review, the number and variety of requests to the Agency for technical assistance, including requests for visits by missions, has exceeded expectations. By participating in the existing international machinery of the United Nations family for the provision of technical assistance, it has been possible for the Agency to ensure a more rational and economical use of available resources and also to benefit from the experience already gained by other participating organizations and by TAB itself. In addition, the United Nations and the specialized agencies concerned are consulted when requests are received by the Agency for assistance in matters which may touch upon their competence. The staff of TAB and the resident representatives of TAB in the field have already rendered valuable assistance to the Agency not only in connexion with technical assistance financed under EPTA, but also with regard to the Agency's regular technical assistance programme.

A. Development of technical assistance projects: Resources available

76. In 1958 and 1959 the resources at the disposal of the Agency were derived from voluntary financial contributions to the General Fund and from offers by Member States of the services of experts, of fellowships and scholarships at national institutions, and of equipment. Beginning with 1959 funds were made available to the Agency through its participation in EPTA.

77. The following table shows the contributions to the General Fund for 1959 and 1960, as at 15 April 1960:

Year	Target set by Board and General Conference (in United States dollars)	Amount pledged (expressed in United States dollars)	Amount paid (expressed in United States dollars)
1959	1 500 000	1 183 044	1 121 281
1960	1 500 000	944 937	63 672

Detailed statements of pledges and payments for 1959 and 1960 are given in Annexes E and F.

78. The donations in kind in the form of fellowships, scholarships and offers of the services of experts, made to the Agency in 1959 and 1960 have also been substantial and have covered a number of important aspects of the peaceful uses of atomic energy. Lists of fellowships to be financed by Member States and offered to the Agency for 1959 and 1960 are given in Annex G and the offers of experts are described in Annex I. Valuable equipment has also been received or offered by six Member States. In addition the United States has offered equipment for technical assistance projects up to a value of US $200 000. These offers are described in Annex J.

79. It may be recalled that, as 1959 was the first year of the Agency's participation in EPTA, the requirement that the Agency's programme should be submitted to EPTA's usual programming procedure was waived for that year. In 1959 the Agency received a special allocation of EPTA funds amounting to a total of US $187 000 of which US $128 000 were set aside for fellowships and US $59 000 for expert assistance and equipment. Additional funds to the amount of US $165 264 were made available to the Agency from the working capital and reserve fund of the Executive Chairman of TAB to permit the financing of some urgent requests for experts and also (as a special measure in the Agency's first year of operation) to provide trained local personnel with whom the Agency's experts could later work. From this sum US $124 164 were set aside for fellows and US $41 100 for experts.

B. Kinds of assistance

80. In addition to the customary forms of technical assistance given by the United Nations family (services of experts, fellowships, exchange and training and limited equipment) members of the Agency's Secretariat have provided substantial technical advice, either in consultations at headquarters or by short missions to Member States. The Agency also places research contracts in institutes in Member States.

81. The Agency generally gives advice or technical assistance on the following matters:

(a) The setting-up of national atomic energy establishments and the planning and implementation of atomic energy programmes;

(b) The design, construction, operation and use of nuclear reactors of all types and of other nuclear facilities;

(c) The use of radioisotopes in agriculture, medicine, industry and research;

(d) Health, safety and waste disposal; and

(e) The prospecting, mining and processing of nuclear raw materials.

From 1960 the Agency will also give technical assistance to Member States in the measurement of radioactive contamination.

82. The following paragraphs give a brief survey of the assistance given in the period under review.

1. Preliminary surveys

83. The object of these surveys was described in the report to the Council for 1958-59 [9] and is also referred to in the introduction. [10] Experience has confirmed that many Member States also wish to have assistance in the first steps of setting up the administrative machinery for dealing with nuclear energy and in planning their programmes. Accordingly the work of the two missions despatched in 1958 was carried further by four preliminary assistance missions in 1959. As a rule, the missions were composed of seven or eight members including scientists drawn from the Agency's staff as well as from Member States, and their work was organized in consultation with other interested agencies, the resident representatives of TAB and field representatives of the United Nations and specialized agencies. The following Member States were visited in 1959: Afghanistan, Brazil, Burma, Ceylon, China, Indonesia, Iran, Iraq, Japan, Republic of Korea, Philippines, Thailand, Turkey, Venezuela, Viet-Nam and Yugoslavia. The missions studied the needs these countries might have for technical assistance to further the development of their activities concerning the use of nuclear energy for peaceful purposes related to: education and training, reactor programmes, radiochemistry, applications of radioisotopes in agriculture and medicine, health physics, nuclear power and energy, prospecting, mining and processing of nuclear raw materials. In certain cases the visits of the missions resulted in changes in the organization of nuclear energy activities and helped national authorities in the identification of worthwhile projects and the formulation of requests to the Agency for technical assistance.

84. In response to specific requests, missions of a more limited scope, consisting of two or three experts, have visited Argentina, Greece, Iceland, Morocco, Pakistan, Tunisia and the United Arab Republic.

85. It is planned that three full preliminary assistance missions will visit Member States in Africa and Latin America during 1960. Except for further preliminary surveys in those

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[9] United Nations document E/3248, paragraph 67.

[10] See paragraph 5 above.

continents which may be needed in 1961 it is believed that the need for preliminary advice to Member States will have been largely satisfied by the end of this year.

2. Expert advice and assistance on specific projects

86. In 1959 the Board of Governors approved requests for technical assistance under the operational programme involving the services of 32 field experts for a total period of 357 man-months. Six of these experts will have completed their assignments by the end of June 1960 while most of the remaining 26 will be in the field. It is expected that, under the operational programme for 1960, the Board will approve requests involving the services of approximately 25 experts for some 240 man-months. During 1960, the Agency is implementing a field programme under EPTA involving the services of 26 experts for a total of 180 man-months.

3. Training and exchange

87. In many parts of the world the scarcity of trained personnel is a brake on progress in developing uses for nuclear energy. Accordingly an important part of the Agency's activities is directed towards the training and exchange of scientists and experts.

(a) Fellowships

88. These cover three kinds of training:

(i) General techniques training: to develop skills in the use of some fundamental techniques in the domain of nuclear energy;

(ii) Specialist training: to prepare specialists in the theoretical and experimental aspects of science and technology of nuclear energy; and

(iii) Research training: tp provide advanced training, including active participation in research work, for persons potentially qualified to develop and carry out research programmes in the basic sciences and engineering.

89. By August 1959, 568 nominations from 44 Member States had been received under the 1959 programme. Of these nominations, 356 were selected for awards including 84 awarded under EPTA. A detailed description of the status of the 1959 fellowship nominations, awards and placements, whether financed directly by Agency funds, EPTA funds or by Member States, may be found in Annex H.

90. By 15 April 1960 570 nominations had been received from 37 countries under the 1960 programme.

(b) Exchange of scientists

91. On request, the Agency has arranged for visits of teaching personnel to give special courses in the theoretical and experimental aspects of nuclear physics, radiochemistry, etc., and has also arranged the exchange of scientists, engineers and other specialists to hold courses in special techniques of research. The Agency has also sent experts and consultants to advise on the education of technical and scientific personnel in universities and institutes.

(c) Training courses

92. In 1959 the Agency organized its first short-term training course in Member States. This was held from 20 July to 10 September 1959 in co-sponsorship with FAO and in co-operation with the United States Government and Cornell University, and was also the first internationally organized training course on radioisotope techniques in agriculture. At the invitation of the Government of Argentina the Agency also helped to arrange a course on the application of radioisotopes in agriculture and in medicine which was organized by the Argentine Atomic Energy Commission for Latin American countries and was held from

9 November to 18 December 1959. UNESCO and the Agency jointly sponsored with the Indian Government a further course on the application of radioisotopes in agricultural research which was held in New Delhi from 20 January to 17 February 1960.

93. The Agency is giving consideration to the possibility of organizing the following courses before the end of 1960: a course on radioisotopes in agricultural research to be held in Europe in September-October; a joint UNESCO-Agency reactor course in India and a lecture course in Athens on the application of radioisotopes in archeology (carbon 14 dating techniques). In addition the Agency has agreed to co-operate in the course on the application of radioisotopes in medicine which is being organized by CCTA in Leopoldville from mid-May until the end of June.

94. The practice established for such training courses is that the host Government usually provides laboratory and teaching facilities and some of the teaching staff, while the Agency assists in preparing the course, provides additional teaching staff and a limited number of fellowships. The courses are normally of an international or regional character.

95. In connexion with its training programme and in order to provide for a general international discussion of the training problems presented by the introduction of nuclear technology, the Agency and UNESCO in July 1959, in co-operation with the Institut national des sciences et techniques nucléaires organized a seminar on atomic energy and its educational problems. There were 71 participants from 31 countries and seven from intergovernmental organizations. The seminar will be followed by regional meetings on the same subject in 1960 and succeeding years.

96. Also in connexion with its training programme, the Agency is making use of two mobile radioisotope laboratories to train persons studying such sciences as agriculture, medicine and chemistry, in the use of radioisotopes. The first mobile laboratory, after being used to give courses in Austria and the Federal Republic of Germany, was despatched to the Republic of Korea, while the second was sent to Mexico and will visit Argentina and other states in Latin America.

4. Equipment and supplies

97. Since it is very seldom possible to carry out any nuclear energy project or research without a certain amount of specialized equipment, a number of requests for the services of experts are accompanied by requests for equipment. The Board of Governors has recognized that equipment plays a more important role in the utilization of atomic energy than in most fields where technical assistance is requested and that a less developed country embarking on an atomic energy programme may accordingly have to consider a substantial investment in foreign currency. The Board has therefore decided that the general practice of EPTA for the provision of equipment and supplies should be followed in a flexible manner with regard to projects under the Agency's programme.

98. In 1959, the Board of Governors approved, under the Agency's operational programme, requests for scientific and technical supplies and equipment from eight Member States, totalling an estimated value of US $125 000.

99. Under the 1960 programme, requests have been received for equipment and supplies to the value of approximately US $500 000. It is doubtful, however, whether the Agency's resources, even taking into account the offer by the United States of equipment for technical assistance projects up to a value of US $200 000, will be sufficient to meet these requests in full.

C. Research contracts and grants

100. Research and development work is of particular importance at the present early stage of nuclear science and technology and the Agency's role in this connexion is stressed by its Statute. The various ways in which the Agency encourages research have already been alluded to; they include scientific meetings and other means of promoting exchange of scientific and technical information, limited work in the Agency's own laboratory, and research contracts. The subjects of research contracts fall into two categories:

(a) Nuclear science problems of general concern, which are at the same time of particular relevance to the Agency's work (e.g. in the field of health and safety); and

(b) Problems of special interest to the less developed areas. Contracts on these are awarded, whenever possible, in laboratories or institutes of less developed Member States.

Thus, in addition to serving the purpose of fostering the development of nuclear energy in general, these contracts act in certain cases as a useful stimulus to national scientific advancement in individual Member States. The research contracts approved for award in 1959 are summarized in Annex K.

101. Besides this form of assistance to national research institutions the Agency has started a programme of research grants to individual scientists to enable them to do advanced research work in the laboratories of other countries. This is distinct from research training referred to in paragraph 87 above. The first such grant was awarded this year to a scientist from India.

ANNEX A

MEMBERSHIP OF THE AGENCY

(at 15 April 1960)

1. Afghanistan
2. Albania
3. Argentina
4. Australia
5. Austria
6. Belgium
7. Brazil
8. Bulgaria
9. Burma
10. Byelorussian Soviet Socialist Republic
11. Cambodia
12. Canada
13. Ceylon
14. China
15. Cuba
16. Czechoslovakia
17. Denmark
18. Dominican Republic
19. Ecuador
20. El Salvador
21. Ethiopia
22. Finland
23. France
24. Germany, Federal Republic of
25. Greece
26. Guatemala
27. Haiti
28. Holy See
29. Honduras
30. Hungary
31. Iceland
32. India
33. Indonesia
34. Iran
35. Iraq
36. Israel
37. Italy
38. Japan
39. Korea, Republic of
40. Luxembourg
41. Mexico
42. Monaco
43. Morocco
44. Netherlands
45. New Zealand
46. Nicaragua
47. Norway
48. Pakistan
49. Paraguay
50. Peru
51. Philippines
52. Poland
53. Portugal
54. Romania
55. Spain
56. Sudan
57. Sweden
58. Switzerland
59. Thailand
60. Tunisia
61. Turkey
62. Ukrainian Soviet Socialist Republic
63. Union of South Africa
64. Union of Soviet Socialist Republics
65. United Arab Republic
66. United Kingdom of Great Britain and Northern Ireland
67. United States of America
68. Venezuela
69. Viet-Nam
70. Yugoslavia

ANNEX B

AGENCY PUBLICATIONS

(16 April 1959 - 15 April 1960)

Directory of Nuclear Reactors, 2 volumes

Nuclear Electronics, 2 volumes

International Directory of Radioisotopes, 2 volumes

Legal Series No. 1: Multilateral Agreements, 1 volume

Safety Series No. 1: Safe Handling of Radioisotopes

Medical Radioisotope Scanning, 1 volume

Radioisotope Teletherapy Equipment - International Directory, 1 volume

Reactor Physics Series No. 1: Heavy Water Lattices, 1 volume

No. 2: Tritium: dosage, préparation de molécules marquées et applications biologiques

No. 3: Equipement électronique pour l'industrie nucléaire française

List of References on Nuclear Energy, volume 1: Nos. 1-6

volume 2: Nos. 1-8

ANNEX C

AGENCY CONFERENCES, SYMPOSIA AND SEMINARS IN 1959

Title	Date	Place
Seminar on Medical Radioisotope Scanning (co-sponsored by WHO)	25 - 27 February	Vienna
Symposium on Radioactivation Analysis (in co-operation with the Joint Commission on Applied Radioactivity of the ICSU)	1 - 3 June	Vienna
Symposium on the Immediate and Low-Level Effects of Ionizing Radiations (initiated by the Italian Committee for Nuclear Research and by UNESCO, and co-sponsored by the Agency)	22 - 26 June	Venice, Italy
Seminar on Atomic Energy and Its Educational Problems (co-sponsored by UNESCO)	6 - 10 July	Saclay, France
International Conference on the Preservation of Foods by Ionizing Radiations (Massachusetts Institute for Technology, co-sponsored by the Agency)	28 - 31 July	Cambridge, USA
Conference on the Application of Large Radiation Sources in Industry and Especially to Chemical Processes	8 - 12 September	Warsaw, Poland
Symposium on Metrology of Radionuclides (co-sponsored by ICRU)	14 - 16 October	Vienna
Conference on the Disposal of Radioactive Waste (co-sponsored by UNESCO and in co-operation with FAO)	16 - 21 November	Monaco

ANNEX D

AGENCY CONFERENCES, SYMPOSIA AND SEMINARS IN 1960

Title	Date	Place
Conference on Medium and Small Power Reactors	5- 9 September	Vienna
Conference on the Use of Radioisotopes in Physical Sciences and Industry	6-17 September	Copenhagen, Denmark
Seminar on Codes for Reactor Computations	25-29 April	Vienna
Symposium on Fuel Element Fabrication, with Special Emphasis on Cladding Materials	10-13 May	Vienna
Symposium on Selected Topics in Radiation Dosimetry	7-11 June	Vienna
Symposium on the Effects of Ionizing Radiation on Seeds and their Significance on Crop Improvement	8-12 August	Karlsruhe, Federal Republic of Germany
Symposium on Inelastic Scattering of Neutrons in Solids and Liquids	11-14 October	Vienna
Symposium on Neutron Pile Research	17-21 October	Vienna
Symposium on the Diagnosis and Treatment of Acute Radiation Injury	17-22 October	Geneva, Switzerland
Symposium on the Chemical Effects of Nuclear Transformation	24-27 October	Prague, Czechoslovakia
Regional Symposium on Education and Nuclear Energy	7-11 November	San Carlos de Bariloche, Argentina
Symposium on Nuclear Ship Propulsion, with Special Reference to Safety	14-18 November	Italy
Symposium on Power Reactor Experiments and Tests	28 November - 2 December	Vienna
Symposium on Pest Control by Radiation	5- 9 December	India
Regional Symposium on the Use of Radioisotopes in the Study of Endemic and Tropical Diseases	12-16 December	Bangkok, Thailand

ANNEX E

CONTRIBUTIONS PLEDGED TO THE GENERAL FUND IN 1959

(expressed in United States dollars)

	Amount pledged	Amount paid
ARGENTINA	5 600	5 600
AUSTRALIA	10 000	10 000
AUSTRIA	2 000	2 000
BELGIUM	10 000	-
BRAZIL	15 000	15 000
BURMA	1 000	1 000
CANADA	50 000	50 000
CEYLON	1 050	1 050
CHINA	6 000	6 000
CZECHOSLOVAKIA	13 888	-
DENMARK	9 150	9 150
FINLAND	5 000	5 000
FRANCE	30 000	30 000
GERMANY, FEDERAL REPUBLIC OF	20 000	20 000
GREECE	2 500	-
GUATEMALA	1 000	-
HOLY SEE	2 000	2 000
INDONESIA	2 000	2 000
ISRAEL	1 111	1 111
ITALY	19 400	19 400
JAPAN	20 000	20 000
MEXICO	2 000	2 000
MONACO	1 000	1 000
NETHERLANDS	10 000	10 000
NORWAY	7 000	7 000
PAKISTAN	8 000	8 000
PHILIPPINES	2 000	-
POLAND	25 000	25 000
PORTUGAL	3 500	3 500
SWEDEN	15 000	15 000
SWITZERLAND	11 628	11 628
THAILAND	2 000	2 000
TURKEY	3 333	3 333
UNION OF SOUTH AFRICA	10 000	10 000
UNION OF SOVIET SOCIALIST REPUBLICS	125 000	125 000
UNITED ARAB REPUBLIC	7 321	7 321
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	125 000	125 000
UNITED STATES OF AMERICA	500 000[a/]	500 000[a/]
VENEZUELA	2 000	-
VIET NAM	2 041	2 041
YUGOSLAVIA	3 000	3 000
	1 091 522	1 060 134
UNITED STATES OF AMERICA (Matching contribution)	91 522	61 147
	1 183 044	1 121 281

a/ In addition US$ 600 000 for the Agency's functional laboratory.

ANNEX F

CONTRIBUTIONS PLEDGED TO THE GENERAL FUND UP TO 15 APRIL 1960

(expressed in United States dollars)

	Amount pledged	Amount paid
AUSTRALIA	12 500	12 500
AUSTRIA	5 000	1 450
BRAZIL	15 000	15 000
BULGARIA	735	-
CANADA	50 000	-
CEYLON	1 250	1 250
CHINA	5 000	-
CZECHOSLOVAKIA	13 888	-
DENMARK	8 400	8 400
FINLAND	5 000	-
FRANCE	30 000	-
GERMANY, FEDERAL REPUBLIC OF	40 000	-
INDIA	20 000	-
ISRAEL	1 111	-
JAPAN	22 000	-
KOREA, REPUBLIC OF	2 000	2 000
MEXICO	5 000	5 000
MONACO	2 000	2 000
NETHERLANDS	12 500	-
NORWAY	7 000	-
PORTUGAL	3 500	-
SWEDEN	15 000	-
SWITZERLAND	11 628	11 628
TURKEY	4 444	4 444
UNION OF SOUTH AFRICA	10 000	-
UNITED ARAB REPUBLIC	10 981	-
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	125 000	-
UNITED STATES OF AMERICA	500 000	-
VENEZUELA	2 000	-
YUGOSLAVIA	4 000	-
	944 937	63 672

ANNEX G

FELLOWSHIPS, TO BE FINANCED BY MEMBER STATES, OFFERED TO THE AGENCY FOR 1959

ARGENTINA[a/]	10
BELGIUM[a/]	7
BRAZIL	30
CZECHOSLOVAKIA	13
DENMARK	4 - 5
FRANCE	12
INDIA	5
ISRAEL	2
ITALY[a/]	10
JAPAN[a/]	7 - 10
NORWAY	3
POLAND	5
ROMANIA	7 - 9
SPAIN	5
SWITZERLAND	4 - 5
UNION OF SOVIET SOCIALIST REPUBLICS	70
UNITED ARAB REPUBLIC	6
UNITED STATES OF AMERICA[a/]	120
YUGOSLAVIA	5
TOTAL	325 - 332

a/ Additional openings have been made available by these countries for the 1960 programme.

1959 FELLOWSHIP NOMINATIONS, AWARDS AND PLACEMENTS AT 15 APRIL 1960

Nominating Country \ Host Country	Nominations Received	Argentina	Australia	Austria	Belgium	Canada	Czechoslovakia	Denmark	France	Germany	Hungary	India	Israel	Italy	Japan	Netherlands	New Zealand	Norway	Poland	Romania	Spain	Sweden	Switzerland	United Kingdom	United States of America	Union of Sov. Soc. Rep.	Yugoslavia	OEEC	CERN	1) Type I fellowships	2) Type II fellowships	3) EPTA fellowships	TOTAL AWARDS
Afghanistan	3				2	1																								3			3
Argentina	6					2																		1	1						1	3	4
Australia	1					1																								1			1
Austria	14					2				1														3	3	1				7	3		10
Brazil	9								1	1														1	2					5			5
Burma	14											1			2									3	2					1	4	3	8
Cambodia	1								1																						1		1
Ceylon	3																							1	1						1	1	2
China	32		2							1					5										3					5	5	1	11
Czechoslovakia	9				1	1				3														1	2			1		7	2		9
Denmark	5																								3					3			3
Ecuador	2																				1										1		1
Finland	6									1												2		1	1					2	1	2	5
France	3																								2						2		2
Greece	11						1			1				2										1	4					3	6		9
Guatemala	4																				1				1						2		2
Honduras	1																																-
Hungary	22			1				1	1	4				2								2		1	3	3				14	4		18
Iceland	2																					1			1						1	1	2
Indonesia	12														2									1		7				9	1	10
Iran	12				2	1			1			1			1							1			3					1	7	2	10
Israel	2																							1	1					1		1	2
Italy	70	1			2	1			4	2						1			1	1		2	1	6	4	3	1			17	13		30
Japan	25								1	1														3	14			1		4	8	8	20
Korea, Republic of	46		1			2		1		1								1				1	2	1	6					7	7	2	16
Mexico	6																								3					3			3
Monaco	1								1																					1			1
Netherlands	2				1																				1					1	1		2
Nicaragua	1																																-
Norway	3													1								1		1						3			3
Pakistan	11		2													1								1						3		1	4
Paraguay	2	1																						1							2		2
Philippines	8		2			1																		2	1					3	1	2	6
Poland	18			1					3	1													1	3	1	2			1	9	4		13
Romania	10				1				2					1					1						2	1				2	6		8
Spain	1																							1						1			1
Sudan	3																																-
Switzerland	2																								1						1		1
Thailand	40		1							1				1	4		1							4	6					5	10	3	18
Turkey	25				1	1			4	2				1		1								3	3					4	7	5	16
Union of South Africa	9									1														2	3					4	2		6
United Arab Republic	46				1	1	3	1	2	4	1			1	1	1		2	1				1	4	8	2				8	18	8	34
United States of America	5				1					1														1						3			3
Venezuela	5																								2					1	1		2
Yugoslavia	63				5	2			6	1			1	1			1					1		9	3	4				16	8	10	34
TOTAL	576	2	8	2	17	16	4	3	27	27	1	2	1	10	15	4	2	3	3	1	2	11	5	57	91	23	1	2	1	148	139	54	341 4)

1) *Financed under the Agency's regular programme.*
2) *Primarily financed directly by Member States.*
3) *Financed under EPTA.*

4) *The figures in this column relate to awards which have been taken up or which are expected to be taken up. They do not include the awards to 36 candidates who were subsequently withdrawn.*

ANNEX I

OFFERS OF EXPERTS RECEIVED

Country	Number of experts offered	Expense to the Agency
ARGENTINA	not specified	none
AUSTRALIA	not specified	not specified
BELGIUM	not specified	not specified
CANADA	not specified	not specified
CZECHOSLOVAKIA	10	none
DENMARK	not specified	not specified
FRANCE	5-10	Agency or recipient countries to pay
INDIA	not specified	not specified
ISRAEL	not specified	not specified
ITALY	not specified	not specified
JAPAN	2	none
SWITZERLAND	not specified	not specified
UNION OF SOUTH AFRICA	not specified	not specified
UNION OF SOVIET SOCIALIST REPUBLICS	20-30	none
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	not specified	not specified
UNITED STATES OF AMERICA	20-30	none
YUGOSLAVIA	20	not specified

ANNEX J

OFFERS OF EQUIPMENT RECEIVED

Country	Items	Description
BELGIUM	1	Portable geological survey meter
	1	Portable contamination monitor
	3	Laboratory radiation monitors
CANADA	1	Transistor Geiger counter
	1	Foot monitor
	1	High-range probe
FRANCE	2	Scalers EACP2
	2	Preamplifiers GMP3
	2	Power supply units
	2	Counters 13A7 with 2 spare tubes 13E1
	1	Ratemeter 1PAB with counter 13A7
	1	Ionization chamber with amplifier and box with planchets
	5	Fountain pen dosimeters SEQ3
	1	Charger
	2	Lead castles and supports
	1	4 Pi GM counting system
	1	Low background counting system
	1	Set of 26 different standard electronic circuits
	1	Set of 10 mechanical accessories
	1	Coincidence unit
	1	Flow counter
	1	Oscilloscope
NETHERLANDS	1	Gamma spectrometer
UNITED STATES OF AMERICA	2	Mobile radioisotope laboratories
	-	Equipment for technical assistance projects up to a value of US $200 000
YUGOSLAVIA	1	Gamma recording spectrometer consisting of:
		Scintillation detection unit SC-1A
		HV supply UN3-C
		Linear amplifier P-100

Country	Items	Description
YUGOSLAVIA contd.		Single-channel pulse-height amplifier AA-2
		Slow sawtooth generator
		Linear ratemeter RM-2
		Recorder
		Decimal Scaler SR-1

ANNEX K

RESEARCH CONTRACTS

I

Research contracts approved by the Director General, arranged by countries

Country	Number of contracts
ARGENTINA	1
AUSTRIA	3 + 3[a/]
BELGIUM	1
CZECHOSLOVAKIA	1
FINLAND	1
FRANCE	6
GERMANY, FEDERAL REPUBLIC OF	1
GREECE	1
IRAQ	1
ITALY	3
JAPAN	7
NETHERLANDS	1
NORWAY	3
PHILIPPINES	1
POLAND	3
SWEDEN	2
SWITZERLAND	2
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	2
UNITED STATES OF AMERICA	1
YUGOSLAVIA	2
INTERNATIONAL BODY	1
TOTAL	44 + 3[a/]

a/ Renewal.

II

Research contracts approved by the Director General, arranged by subject matter

Subject matter of research	Number of contracts 1958	1959	Total
Biological protection against radiation	-	4	4
Chemical protection against radiation	1	1[a]	1 + 1[a]
Genetic mutations caused by radiation	-	5	5
Health physics	1	2	3
Low level and immediate radiation effects	1	3 + 1[a]	4 + 1[a]
Sub-total	3	14 + 2[a]	17 + 2[a]
Safe disposal of radioactive wastes	1	8 + 1[a]	9 + 1[a]
Safeguards methods	3	3	6
Use of isotopes in agriculture	-	2	2
Use of isotopes in medicine	-	3	3
Sub-total	-	5	5
Radiation resistance and sensitivity of biological materials	-	6	6
Radioisotope preparation and separation method	-	1	1
GRAND TOTAL	7	37 + 3[a]	44 + 3[a]

a/ Renewal.