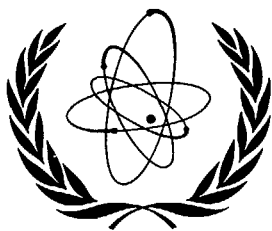


International Atomic Energy Agency

ANNUAL REPORT TO
THE ECONOMIC AND
SOCIAL COUNCIL OF
THE UNITED NATIONS
FOR 1970-1971



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THE AGENCY'S ANNUAL REPORT TO THE ECONOMIC AND SOCIAL COUNCIL
OF THE UNITED NATIONS FOR 1970-71

The text of the Agency's annual report to the Economic and Social Council of the United Nations for 1970-71 is reproduced in this document for the information of all Members.

ANNUAL REPORT BY THE INTERNATIONAL ATOMIC ENERGY AGENCY
TO THE ECONOMIC AND SOCIAL COUNCIL OF THE UNITED NATIONS
FOR 1970-71

(1 April 1970-31 March 1971)

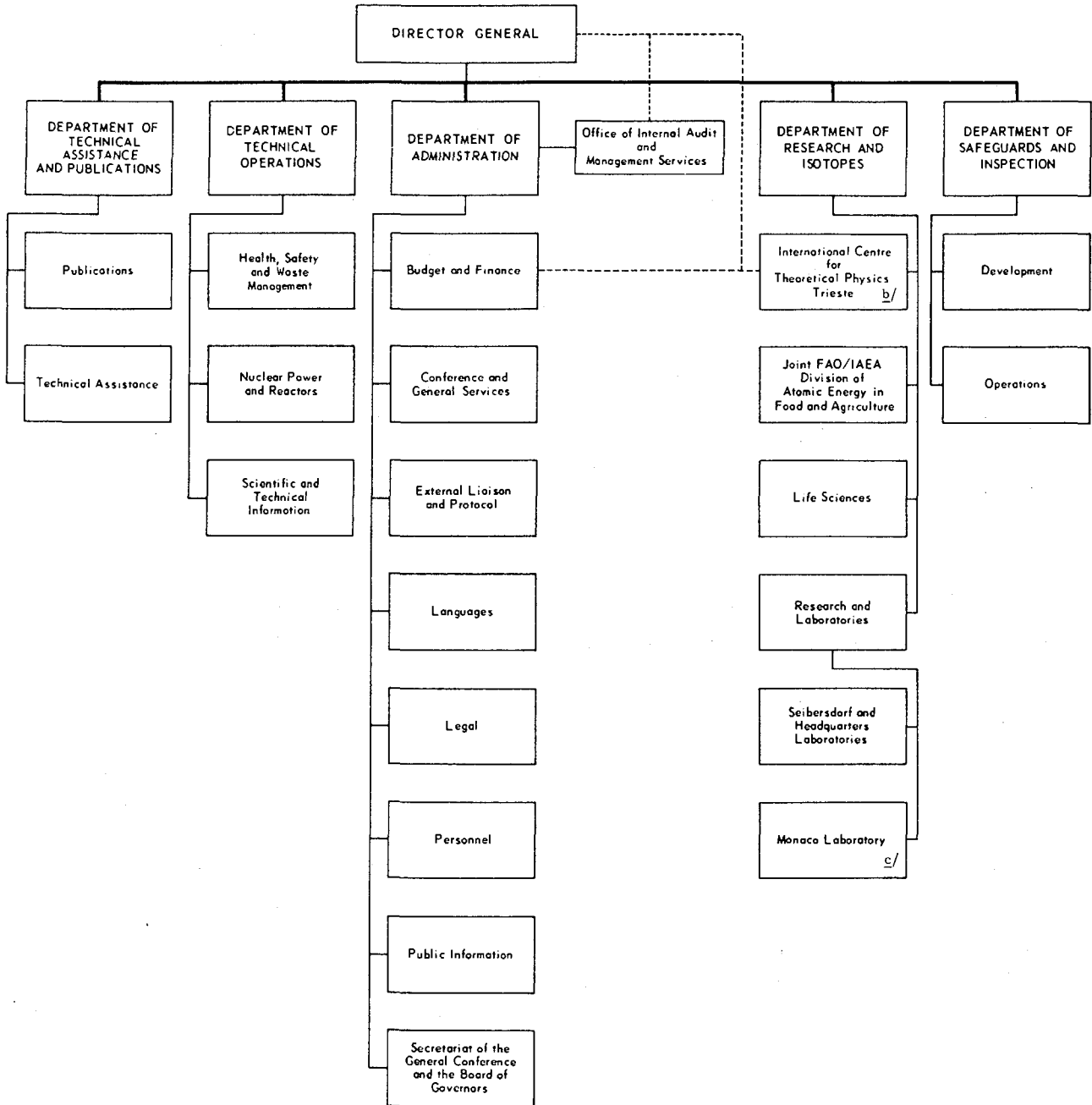
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List of abbreviations

ACC	Administrative Committee on Co-ordination
Agency	International Atomic Energy Agency
Board	Board of Governors of the Agency
CCAQ	Consultative Committee on Administrative Questions
CERN	European Organization for Nuclear Research
CMEA	Council for Mutual Economic Assistance
ECE	Economic Commission for Europe
ECOSOC	Economic and Social Council of the United Nations
ENEA	European Nuclear Energy Agency of the Organisation for Economic Co-operation and Development
EURATOM	European Atomic Energy Community
FAO	Food and Agriculture Organization of the United Nations
IAEA	International Atomic Energy Agency
IANEC	Inter-American Nuclear Energy Commission of the Organization of American States
ILO	International Labour Organisation
IMCO	Inter-Governmental Maritime Consultative Organization
INIS	International Nuclear Information System
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
OAU	Organization for African Unity
OECD	Organisation for Economic Co-operation and Development
UNDP	United Nations Development Programme
UNDP(SF)	United Nations Development Programme (Special Fund component)
UNDP(TA)	United Nations Development Programme (Technical Assistance component)
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization
WMO	World Meteorological Organization

Organizational Chart ^{a/}



^{a/} No changes have been made in the chart during the course of the year covered by this report.

^{b/} Joint Agency/UNESCO project.

^{c/} With the increasing participation of UNESCO and FAO.

INTRODUCTION

(incorporating CONSTITUTIONAL DEVELOPMENTS
AND ACTIVITIES OF MAJOR ORGANS)

1. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) entered into force on 5 March 1970. By 31 March 1971 it had been ratified and acceded to by 68 Governments and signed by a further 31.

2. Article III requires non-nuclear-weapon States party to NPT to conclude agreements with the Agency, within specified time limits, for the application of the Agency's safeguards to all their nuclear activities for peaceful purposes. From June 1970 until March 1971 a safeguards committee set up by the Agency's Board of Governors was engaged in working out the structure and content of such agreements and in seeking a generally acceptable formula for apportioning the Agency's costs of applying safeguards both under them and under its other safeguards agreements as well. The Committee was open to all Member States and representatives of some 50 took part in its work. It recommended that the agreements in question should consist of two parts, the first to set forth the basic legal, financial and administrative obligations of the State and the Agency and certain general technical provisions as well, and the second to provide in detail for the technical safeguards procedures which will be followed. The Board has authorized the Director General to follow the Committee's recommendations in negotiating agreements with the States concerned. The Committee has also recommended that the cost of applying safeguards in Member States should continue to be met from the ordinary budget of the Agency, but that the assessment of Members' shares of this cost should be adjusted to meet the position of those with low per capita incomes.

3. Article IV of NPT binds the Parties to closer international co-operation in developing the peaceful uses of atomic energy with due consideration for the needs of the developing areas of the world. A number of Member States have increased their contributions to the Agency's own technical assistance programme. For the first time since 1962 it has been possible to raise the target for funds for this programme from \$2 million to \$2.5 million. There has also been an increase in the resources in kind (free fellowships, equipment etc.) made available to the Agency's technical co-operation programmes.

4. Article V provides for international co-operation in sharing with non-nuclear-weapon States, party to the Treaty, the benefits that may be derived from nuclear explosions for peaceful purposes. ECOSOC was informed last year of the first international meeting on this subject, which led to a remarkable exchange and discussion of hitherto unavailable information. Technological developments indicated that the first industrial uses of nuclear explosions for peaceful purposes were likely to be underground, for developing mineral resources, recovering oil and gas, etc. The Agency accordingly held a second international meeting in January 1971 on contained (underground) peaceful nuclear explosions. The results show that it is technologically possible to use underground nuclear explosions on an industrial scale. More practical experience in the technology and additional data on the effect of multiple explosions will, however, have to be acquired before the application of this technique will become economic.

5. In accordance with the invitation set forth in Resolution 2605 B (XXIV) of the General Assembly of the United Nations, the Agency also held a meeting of experts in November 1970 to examine the question of the appropriate international observation of peaceful nuclear explosions. In February 1971 the Board of Governors considered the report of this group of experts and decided that the Agency should proceed further with work on this subject on the basis of the group's report. All Member States that wish to do so have been invited to comment thereon.

6. While the implications of NPT for the Agency have been the main preoccupation of the Agency's governing organs during the last year, the General Conference has also approved an amendment to the Statute that will enlarge the size of the Board, in particular by providing more seats for developing Member States. At present 25 Members serve on the Board and it is expected that when the amendment comes into force, upon ratification by two thirds of all Members, the number will increase to 34.

7. Although the Agency's safeguarding functions are growing in importance as a result of NPT, the primary purpose of the Agency is to promote the peaceful uses of atomic energy. The Fourth International Conference on the Peaceful Uses of Atomic Energy, which has been convened to meet in Geneva from 6 to 16 September 1971, will provide the world's public officials, economists and planners, as well as technologists, with an opportunity for a major assessment of the contribution that atomic energy can make to their countries' prosperity and of the results achieved and the problems encountered so far. The Agency is co-operating with the United Nations in organizing the Conference and has been assigned responsibility for its scientific aspects.

8. For developing countries the major obstacle to the spread of nuclear power remains an economic one, owing to the fact that the minimum competitive size of the nuclear plant may be much larger than many developing countries need, that the capital costs of nuclear power are higher per kilowatt - although their running costs are lower - than those of conventional plants, and because of the problems that developing countries have to face in finding the foreign exchange needed for large, sophisticated plants. These problems were again raised at the last session of the Agency's General Conference.

9. The numerous and far less costly applications of nuclear techniques in agriculture, medicine, hydrology and industry have continued to expand the contribution they are making to science and to economic development. They have played a role of some importance in the "Green Revolution", which is the subject of a special booklet produced for ECOSOC as an addendum to this report. They are also providing useful techniques for measuring and combating pollution. Most of the Agency's technical assistance activities consist of helping developing countries to introduce nuclear techniques into their agricultural and medical research centres; in teaching hydrologists the value of isotope methods; in applying nuclear techniques for insect control and eradication; in helping new industries to use the automatic quality and production controls or novel processes. The technical assistance programmes are often complemented by the Agency's research contracts. Support is given by means of co-ordinated research programmes in which nuclear laboratories in groups of developing countries jointly study problems of common interest.

10. The Agency's International Nuclear Information System (INIS) was successfully launched during the past year. It promises to be a useful means of keeping scientists in both developing and advanced countries in close touch with progress being made throughout the world in their special fields of work.

11. With regard to ECOSOC Resolution 1547 (XLIX), the Agency is fully implementing the relevant recommendations of the Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies where they do not require an amendment of the Statute. [1] The Agency is also participating in consultations in CCAQ to reach inter-agency agreement with regard to those recommendations that require joint implementation. Furthermore, a detailed study of the use of the Agency's staff is being made and a number of reassignments and economies have already resulted. Cost and salary increases, coupled with the requirements entailed by NPT, have further strengthened the need for economy in operation and for effective deployment of the Agency's staff.

[1] See also document INFCIRC/126 (United Nations document E/4650), para. 28.

12. The Board does not at present have any major problems of co-ordination that it wishes to bring to ECOSOC's attention. The Board does, however, wish to stress the importance of harmonizing and focusing the work of all interested United Nations agencies concerned with the preservation of man's environment. Environmental questions are of interest to so many bodies that it will be difficult to avoid duplication and wasted effort. The preparations for the United Nations Conference on Human Environment to be held in Stockholm in 1972 should be valuable in establishing priorities of action, clarifying responsibilities and elaborating a clear master plan. The Agency, which is devoting more than \$1 million a year to environmental and related activities will play its proper part in the Conference. In this connection the Agency would again draw attention to the booklet prepared for ECOSOC last year on "Nuclear Energy and the Environment". [2]

13. Comprehensive information about the Agency's recent activities is contained in its last annual report to the General Assembly, [3] while information on the action taken in regard to the uses of nuclear explosions for peaceful purposes, and concerning the further implementation of the recommendations of the Conference on Non-Nuclear-Weapon States is given in separate reports to the Assembly. [4]

14. The present report represents an analytical summary of the Agency activities; its structure and content is in accordance with ECOSOC's various requests.

[2] INFCIRC/139/Add. 1 (United Nations document E/4821/Add. 1) of which copies are still available.

[3] GC(XIV)/430 and INFCIRC/142 (United Nations documents A/8034 and Add. 1).

[4] GC(XIV)/INF/121 (United Nations document A/8080); GC(XIV)/INF/120 and GC(XIV)/436 (United Nations documents A/8079 (Annex) and A/8079/Add. 1).

DEVELOPMENTS IN MAJOR PROGRAMMES

Nuclear power and other major nuclear technologies

15. In 1970 approximately 25 000 MW of nuclear electric capacity was ordered throughout the world, considerably more than the 19 000 MW ordered in 1969 but still under the peak of 30 000 MW in 1967. In view of the significant increases in oil prices in the world, especially in Europe, and of rising coal prices in the United States, the general outlook for nuclear orders in the coming year is favourable. The forecast of 310 000-340 000 MW of installed nuclear capacity in the world by 1980, mentioned in previous reports, still seems to be reasonable.

16. The economic and financial problems that developing countries have to surmount in building nuclear plants, have been referred to in the Introduction. Among the developing countries, the Republic of China ordered its second nuclear plant during 1970. An Agency study has shown that of all nuclear plants in operation in 1980 not more than eight to ten per cent will be in developing countries. The study indicates that the 20 000-25 000 MW of nuclear capacity that these countries expect to install between 1970 and 1980 will require \$3-4000 million of foreign exchange, and that between 1980 and 1985 they plan to bring into operation a further 25 000-35 000 MW nuclear capacity requiring foreign exchange of the order of \$4-6000 million. At the request of the General Conference, the study is being continued and broadened and will pay more attention to long-term and indirect benefits that nuclear power may bring to developing countries.

17. The technical and economical characteristics of the nuclear reactors that could be used in the smaller electrical grids of many developing countries were reviewed by a symposium held by the Agency in Oslo in October 1970, which was attended by experts from 36 countries. The discussions showed that there may be demand for smaller plants in certain regions of the industrial as well as in the developing countries. The cost of smaller plants could be reduced if some standardization in their size could be achieved and, if reliable information were available about the requirements of developing countries, the interest of industry in supplying such plants might be stimulated. Although these plants are characterized as "small and medium nuclear power reactors", their size - 100-500 MW - is still considerable in relation to the present capacity of the grids of many developing countries.

18. In the meantime the Agency will also continue its co-ordinated programme of research agreements in which five leading organizations in Belgium, the Federal Republic of Germany and the Union of Soviet Socialist Republics are developing the latest technical and cost data about small and medium-sized nuclear plants.

19. A symposium held jointly with ECE in October 1970 considered the special problems of integrating nuclear power plants into existing electric grids. The requirements for the economic operation of a nuclear plant are different from those of other types of plants, while the efficient operation of a number of interconnected stations of varying sizes and types poses problems of great complexity. Amongst other matters the symposium considered what role international - and particularly regional - co-operation could play in solving such problems.

20. Certain developing countries are benefiting from the growth of nuclear power by becoming suppliers of uranium. During the year increased prospecting led to important discoveries of uranium in the Central African Republic, Gabon and Niger, as well as in Australia, Canada and the United States of America. A survey that the Agency and ENEA made in April 1970 showed considerable growth in proven uranium reserves since the previous survey in 1967.

21. To meet the demand it will, however, be necessary to construct more mills and related plants by the mid-1970s and to step up prospecting. To assist Member States in this regard the Agency held a panel on uranium exploration geology in April 1970, and a training course in Madrid from September to November 1970 on uranium ore analyses. The Agency and the Department of Economic and Social Affairs of the United Nations are co-operating to ensure that the best use is made of the resources available to them in carrying out the UNDP(SF) projects for uranium exploration and evaluation in Greece and Pakistan which UNDP has assigned to the Agency.

22. Public concern about industrial pollution has led in recent years to a lively discussion of the environmental impact of nuclear power. To provide an opportunity for a dispassionate examination of the matter the Agency, in co-operation with the United States Atomic Energy Commission held a symposium at United Nations Headquarters from 10 to 14 August 1970. Many of the leading nuclear and public health authorities concerned attended the symposium which attracted wide popular as well as scientific interest. The main conclusions were that nuclear power stations contribute far less to environmental pollution than other forms of power production. This is partly due to the absence of smoke stacks releasing combustion products, and also because the industry has from the beginning, due to the nature of the fuel it uses, designed its installations to contain radioactivity safely. The small amounts which are released are well below those permitted by strict regulations and the dose to the public is trivial when compared to natural radioactivity.

23. At the symposium a suggestion was made that the Agency should become a central repository of data on radioactivity released in connection with civilian uses. This suggestion is now under study.

24. It is clear that public interest will demand continuing review of the actions taken by Governments and industries to minimize radiation risks and any other environmental effects. The question of radioactive waste management and disposal will also become more important as nuclear industry grows. One measure, for which there is now wider acceptance, is the establishment by the Agency of an international register of all substantial releases of radioactive wastes (from peaceful activities) into the seas and oceans. This may be the step to a comprehensive register of radioactive disposals into the environment.

25. Recent developments regarding the uses of nuclear explosions for peaceful purposes are referred to in the Introduction.

Nuclear science in food and agriculture

26. The Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture has now been in operation for six years. ECOSOC may be interested in a more detailed report of the results achieved by this pooling of the resources of the two agencies. Accordingly, an addendum to the present report, entitled "Nuclear Techniques and the Green Revolution", is being submitted separately.

27. The following are some of the main developments during the past year:

- (a) The Agency completed the UNDP(SF) project in Central America for the use of radiation-induced sterility in controlling the Mediterranean fruit fly ("medfly"). The project included a successful field demonstration of the technique. In consequence, a request for a new regional project has now been made to UNDP; the new project would include an intensive survey in Nicaragua to delineate the exact area of medfly infestation, and this would be followed by the use of all available suppression techniques with a view to the eventual eradication of the insect in this area;

- (b) The half-way mark has been reached in implementing a UNDP(SF) project in India for promoting the use of nuclear techniques in agricultural studies such as soil fertility, plant breeding, entomology, animal production and health. Under this project a laboratory is being built in New Delhi and support is being given to three other Indian research institutes;
- (c) Twenty countries are taking part in an international project for the wholesomeness testing of irradiated food, which began on 1 January 1971 for an initial period of five years. The project is jointly sponsored by the Agency, FAO and ENEA. It is designed to assess the wholesomeness of selected irradiated foodstuffs. Cash and material contributions are expected to amount to about \$300 000 a year. The first task will be to obtain certain information needed to confirm the international clearances already given by the appropriate WHO committee to irradiated wheat, wheat products and potatoes;
- (d) Among symposia held during the period under review there was one in Greece on radiation sterility for insect control. At another, on the use of nuclear techniques for plant protein improvement, significant increases in plant protein content in induced mutants were reported. The interest of the developing countries in this technique was demonstrated by the attendance of some 200 participants at a study group meeting at Buenos Aires in November to develop mutation breeding programmes in Latin America; and
- (e) In support of the FAO/Agency programme on the use of nuclear techniques for plant protein improvement, the Governments of the Federal Republic of Germany and the United States donated equipment worth \$47 000 and \$38 000 respectively to the Seibersdorf Laboratory.

Nuclear science in medicine

28. The chief applications of nuclear techniques in medicine are:

- (a) To diagnose and treat certain diseases (e. g. cancer and diseases of the thyroid gland such as goitre);
- (b) As a tool of medical research. Nuclear techniques are of particular value since they give direct information about the biological processes occurring within the human body; and
- (c) To follow the life cycle of the carriers of certain diseases.

29. In cancer treatment, the Agency's main efforts are to help developing countries to set up, staff and operate high-energy radiotherapy centres of which there are now more than 300 in the developing regions.

30. In research, the Agency's main effort is to promote studies involving the use of nuclear techniques in dealing with nutritional problems and various diseases endemic in developing countries. The Agency also helps to develop and standardize radioisotope techniques. Its laboratories provide support for its own and for WHO programmes. All these projects are undertaken in close collaboration with WHO.

31. The following are some examples of other work done in the last year:
- (a) The joint Agency/WHO postal service for comparison of radiation doses now serves over 200 institutes (compared with some 120 at the same time last year) in more than 45 countries;
 - (b) Preparations are being made for a postal or teletype service for computer-based planning of radiation treatment. This will be designed especially to help radiotherapy centres in developing countries;
 - (c) International symposia were held on:
 - (i) Dynamic studies with radioisotopes in clinical medicine and research (e.g. diagnostic studies based on observations of the uptake, metabolism, clearance or excretion of administered radioactive materials);
 - (ii) The use of radiation and radioisotopes for the genetic improvement of industrial micro-organisms. Examples of the useful products from industrial micro-organisms having nutritional and medicinal value include antibiotics, vitamins and many other organic compounds; and
 - (iii) Biophysical aspects of radiation quality at Lucas Heights in Australia. This involves investigations of the effects of different types of ionizing radiations on living organisms; and
 - (d) Smaller scientific meetings were held on topics, such as:
 - (i) Preparation of radioactive pharmaceuticals and control of their quality. Radioactively "labelled" pharmaceuticals are increasingly used for diagnostic purposes in medicine, such as localization of tumours or investigation of the state of body organs. The meeting considered particularly how such pharmaceuticals could be prepared in medical isotope laboratories using the radiation-producing machines (neutron generators) that are now being manufactured on a growing scale for industrial purposes;
 - (ii) Organization of medical isotope laboratories, particularly in developing countries. This meeting was held in San Salvador;
 - (iii) How radiation injury in man may be indicated and measured by metabolic and biochemical changes; and
 - (iv) Improved methods of measuring radiation doses and radiation standards. These questions are of obvious importance in radiation therapy.

Nuclear science in industry and hydrology

32. As ECOSOC has previously been informed, there are more than a thousand industrial applications of radioisotope devices and radiation in various branches of industry. Some of the chief uses are:

- (a) To measure and control the quantity and quality of output of continuous-process plants like paper mills, steel mills, oil refineries;
- (b) To apply radioisotopes in the mining industry ranging from rapid, on-the-spot analyses of the mineral content of ores to the logging of oil wells;

- (c) On an increasing commercial scale, to harden and otherwise improve the quality of wood and fibres that have been impregnated with plastics; and
- (d) To detect pollution of the atmosphere and other parts of the environment by means of radioisotope tracers.

33. During the year, the Agency's work has included:

- (a) A tour of various institutes in the United States and Canada by technicians from the developing countries from 10 August to 18 September 1970. The 18 participants from Latin America and the Far East visited more than 40 institutions and studied the use of nuclear techniques in quality control, in the measurement of industrial processes and the use of radiation in the chemical industry;
- (b) A training course on the use of nuclear instruments in prospecting for minerals (Cracow, Poland), and a tour by a group of experts (visiting seminar) of various Member States in the Far East to explain and demonstrate the use of nuclear techniques in developing the mineral resources of these countries;
- (c) A scientific meeting on the use of radiation techniques in industry (Seoul, Republic of Korea), which took account of the rapid growth of the plastic, textile, plywood and petrochemical industries in many developing countries in the region. Fourteen participants from eight Asian countries also took part in a regional training course on industrial radiation processing in Japan; and
- (d) A symposium in October 1970 at Salzburg, Austria, on the use of nuclear techniques to measure and control environmental pollution. The symposium, which was attended by 170 participants, discussed the application of tracer and other nuclear techniques to identify pollutants in the environment.

34. The Agency has further developed its day-to-day co-operation with UNIDO with a view to promoting the integration of nuclear techniques into the industries of the developing countries.

35. Nuclear techniques are also increasingly used in investigating and measuring water resources, whether in the form of snow, surface streams or underground water. They are also used to measure the water content of soil and the sediment carried by rivers. The potential value of these techniques in arid areas is obvious. The Agency receives an increasing number of requests from national hydrological organizations for advice and help, an indication that nuclear techniques are becoming accepted as a standard part of hydrological studies.

36. As in the past, several other agencies (the United Nations, FAO, UNESCO and WHO) have sub-contracted with the Agency to help carry out UNDP(SF) projects for water resources development. One project is for the hydro-agricultural development of a valley in Morocco; another is to intensify the use of ground water in North and Central Tunisia. At the end of 1970, seven sub-contracts in all were being carried out by the Agency, mainly in African countries. The nuclear techniques provide information about the areas from which underground reservoirs draw their water, the rate at which such recharge takes place, the interaction between ground water streams and reservoirs and the speed at which the ground water moves. These data are essential for a rational use and husbanding of ground water resources. These and other nuclear science techniques are also playing a part in the studies being made for the International Hydrological Decade.

Nuclear science information

37. As stated in the Introduction, INIS began operation in 1970. In this computer-based system, scientists in all co-operating Member States are kept informed each month of new material published throughout the world in their particular field of specialization. Abstracts and, eventually, full texts of all new articles are also made available, on request, in microfiche form.

38. The number of reports handled by INIS increased from 147 in May 1970 to 6457 in March 1971. The number of countries taking part in the system has risen from 12 to 38, and of these 21 have contributed input into the system. EURATOM has given valuable help in launching INIS based on its own extensive experience with a similar regional system. Seminars have been held in Vienna and in Bombay to help train experts, particularly from developing countries, to prepare input into the system. The subject coverage of the system was initially limited; in November 1970 a group of experts recommended that the scope of the system should be enlarged in 1972.

39. The Agency's scientific information programme also included 17 large international symposia and seminars, attended by a total of 2462 participants from 69 Member States and from 26 intergovernmental and non-governmental organizations. The Agency is continuing to give financial help to a small number of selected scientists from developing countries to attend each symposium.

CO-ORDINATION WITH OTHER INTERNATIONAL ORGANIZATIONS

40. By Resolution 1548 (XLIX) ECOSOC requested that achievements and problems with regard to co-ordination should be separately described.
41. It has often been pointed out that the applications of nuclear energy are not ends in themselves but that they usually represent one of several means of achieving a broader economic or social objective, such as production of electric power, more or better quality food, improved health, more efficient industrial production, development of water resources and study and control of pollution. Hence, many applications of atomic energy have in the past presented problems of co-ordination with the agencies whose task it is to advance the broader objective.
42. The various arrangements described below have been made to resolve these problems:
- (a) The Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture, the work of which is described in detail in the addendum to this report;
 - (b) It is now the general rule that standards, regulations and recommendations relating to radiological safety, waste management and nuclear safety are issued under the joint authority of WHO and the Agency and, in appropriate cases, also of other interested agencies, such as ILO and FAO. There is a similar close co-ordination between WHO and the Agency in nuclear medicine, and the two agencies have continued to maintain liaison officers at each other's headquarters;
 - (c) Since the beginning of 1970, the International Centre for Theoretical Physics at Trieste has become a joint Agency/UNESCO project;
 - (d) FAO and UNESCO are participating more and more in the work of the International Laboratory of Marine Radioactivity at Monaco;
 - (e) The joint WMO/Agency survey of isotopes in rainfall and other forms of precipitation has been operating on a world-wide basis since 1960;
 - (f) The Agency continues to carry out sub-contracts for other agencies executing UNDP(SF) projects, particularly for the development of water resources; [5]
 - (g) Collaboration with the United Nations is described elsewhere in the report. The Agency and the United Nations are co-operating in the development of nuclear mineral resources to which, it will be recalled, ECOSOC paid particular attention at its forty-ninth session. [6] Co-operation in preparation for the Fourth International Conference on the Peaceful Uses of Atomic Energy is proceeding satisfactorily;
 - (h) UNIDO and the Agency continue to pool many administrative services. In practice, there is little overlap between the substantive activities of the two bodies but informal arrangements have been made to take care of any problems that may arise; and
 - (i) The Agency is a co-sponsor of the Group of Experts on the Scientific Aspects of Marine Pollution, together with UNESCO, WHO, WMO, FAO, IMCO and the United Nations.

[5] See also para. 36 above.

[6] Resolution 1550 (XLIX).

43. "Bilateral" problems with regional organizations (outside the United Nations system) have also been satisfactorily resolved by a variety of means. Numerous joint working groups and activities have been set up with ENEA and IAMEC. For many years there has been good co-operation at the working level with the Joint Institute for Nuclear Research, CERN, CMEA and EURATOM and more recently with OAU. The Board has recently approved the text of an agreement for co-operation between the Agency and the League of Arab States, and the General Conference is expected to authorize its conclusion next September.

44. Two broad groups of "multilateral" co-ordination questions involve the interests of the agencies within the United Nations system. With regard to administrative matters, the record of co-ordination is very good. The autonomous nature of the agencies has, however, made it much more difficult to resolve substantive programme problems that affect groups of agencies. As is pointed out in the Introduction, an important substantive co-ordination question will arise in regard to the preservation of the environment. Before consideration is given to creating any new institutional machinery to deal with this question, full use should be made of the existing resources of the United Nations family. Concerted action may be helped by the experiment that ACC is now making with a "functional group" on the environment, as well as by the practical co-ordination required from all interested organizations in preparation for the 1972 United Nations Conference on Human Environment.

45. With regard to the impact of nuclear energy on the environment, it is clear that no new international machinery is required. Besides the Agency's own primary concern with this matter it is also being dealt with by WHO, FAO and other bodies with whom fully effective co-ordination has been established. This is also true of the relations between the work of the Agency and ENEA and EURATOM which both have important programmes regarding the impact of nuclear energy on the environment.

TECHNICAL CO-OPERATION ACTIVITIES

46. In 1970 some 4.6 million dollars were available for technical assistance and training, compared with 3.7 million dollars in 1969, and 3.5 million dollars in 1968. The breakdown is given in Table 1 below:

Table 1

Technical co-operation resources

	1968	1969	1970
	(in thousands of dollars)		
Regular programme	1348	1586	1749
UNDP(TA)	1134	748	1134
UNDP(SF)	415	792	666
Assistance in kind (estimated value)	574	624	1042
	<u>3471</u>	<u>3750</u>	<u>4591</u>

47. It will be seen that there has recently been an encouraging increase in contributions to the Agency's regular programme of technical assistance. As pointed out in the Introduction, this increase has made it possible to raise the target for voluntary contributions from the figure of 2 million dollars, at which it has remained steady since 1962, to 2.5 million dollars for the year 1971. However, the eroding effects of inflation have more than offset this apparent increase.

48. Much of the assistance in kind given by Member States takes the form of cost-free or subsidized fellowships. Hence it was decided in 1970 that the cash resources devoted to providing expert services and equipment should be increased from 50% to 60% of the total. As a result of this decision and of the increase of contributions it is expected that in 1971 the Agency will be able to meet about 50% of the value of requests for expert services and equipment compared with 37% in 1970, as illustrated in the following table.

Table 2

Experts and equipment

Year	Value of requests received (in thousands of dollars)	Value of assistance approved (in thousands of dollars)	Percentage of requests met
1966	3000	901.6	30.0
1967	2600	975.0	37.5
1968	3600	977.0	27.1
1969	3800	977.0	25.7
1970	3400	1250.0	36.8
1971	3600	1891.0	52.5

49. Other developments in the regular programme include:

- (a) The share of resources allotted to equipment rose from 18.5% in 1966 to 23.7% in 1969, 25% in 1970 and, it is expected, to 29% in 1971; and
- (b) It is expected that the number of Member States receiving experts or equipment, or both, will rise from 40 in 1966 to 52 in 1971.

50. Recent trends in the Agency's fellowship programme are shown in the following table:

Table 3

Distribution of fellowship awards

Type of fellowship	1966	1967	1968	1969	1970	1971 ^{a/}
Type I ^{b/}	82	113	121	118	159	98
Type II ^{c/}	137	138	148	146	163	166
UNDP(TA)	64	18	46	30	34	15
Total	283	269	315	294	356	279

a/ Includes all the awards made under the 1971 fellowship programme as at 31 March 1971.

b/ Financed under the Agency's regular programme.

c/ Primarily financed directly by Member States.

51. Twelve training courses, three study tours, three regional training and demonstration programmes and one advanced reactor physics summer school were organized during 1970. A total of 895 persons (excluding lecturers) from 71 countries took part in these activities compared with 916 and 59 respectively in 1969.

52. Mention has been made in other parts of this report of the UNDP(SF) projects being carried out by the Agency. The position as at 31 March 1971 is summarized in Table 4 below.

Table 4

UNDP(SF) projects for which the Agency is the executing agency

Recipient country and title of the project	Field operations beginning	Project duration (years)	Government and UNDP contributions (in dollars)	Total cost of the project (in dollars)
INDIA, Nuclear research in agriculture	14 October 1968	4.0	2 630 900 ^{a/}	4 020 600
			<u>1 389 700^{b/}</u>	
GREECE, Exploration for uranium in Central and Eastern Macedonia and Thrace ^{d/}	1 May 1971 ^{c/}	1.5	251 300 ^{a/}	557 100
			<u>305 800^{b/}</u>	
PAKISTAN, Detailed exploration of uranium and other radioactive occurrences in the Siwalik sandstones in the Dera Ghazi Khan District, West Pakistan ^{d/}	1 July 1971 ^{c/}	2.0	456 500 ^{a/}	859 900
			<u>403 400^{b/}</u>	

^{a/} Government contribution.

^{b/} UNDP contribution.

^{c/} Proposed commencement date.

^{d/} To be implemented in association with the United Nations.

ADMINISTRATIVE AND BUDGETARY QUESTIONS

53. The amounts spent in the financial years 1969 and 1970 and appropriated by programmes of the Agency for 1971 were as follows:

Programme	1969 actual	1970 actual	1971 budget
<u>Regular Budget</u>			
1. Policy-making organs	526 899	615 784	571 000
2. Executive management and administration	2 484 617	2 641 959	2 590 000
3. Common services	1 717 804	1 806 934	2 206 000
4. Technical assistance and training	614 775	647 690	628 000
5. Research and isotopes ^{a/}	1 969 415	1 923 958	1 876 000
6. Operational facilities ^{b/}	1 008 388	1 152 200	1 297 000
7. Technical operations ^{c/}	1 960 213	2 210 533	2 625 000
8. Safeguards	952 650	1 232 049	1 885 000
9. Contingent extraordinary expenditures	- <u>d/</u>	- <u>d/</u>	100 000
<u>Operational Budget</u>			
1. Operational facilities ^{b/}	736 095	685 945	669 000
2. Technical assistance and training	1 550 600	2 066 014	2 582 000

a/ Including application of nuclear science in agriculture, medicine, hydrology, industry, etc.

b/ Laboratories and Trieste Centre.

c/ Major nuclear technologies in power, desalting, fuel, peaceful nuclear explosions as well as health, safety and waste management and scientific and technical information.

d/ Used in programmes 1-8 above.

54. In 1970 the Agency's total Regular Budget amounted to \$12 250 000 of which \$11 853 000 represented assessed contributions payable by Member States. The Regular Budget for 1971 has been set at \$13 778 000 including, as in 1970, a contingency appropriation of \$100 000 which may be utilized only after specific authorization by the Board. Of the total 1971 budget an amount of \$13 052 000 represents assessed contributions. The 1971 Regular Budget is for the first time presented on a complete programme-budget basis, as recommended by the Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies.

55. The Agency's Operational Budget amounted to \$2 587 000 in 1970, of which \$2 million reflected the target for voluntary cash contributions from Member States, and the balance represented other voluntary contributions for specific purposes, such as support of the International Laboratory of Marine Radioactivity at Monaco and the International Centre for Theoretical Physics at Trieste, and a small amount of miscellaneous income.

56. The Agency's Operational Budget for 1971 has been set at \$3 251 000, of which \$2.5 million reflects a higher target for voluntary cash contributions and the balance represents miscellaneous income and other voluntary contributions to support the programmes mentioned in the preceding paragraph. By 31 March 1971 pledges of voluntary contributions amounted to 83.65% of the \$2 million target for 1970 and to 84.83% of the \$2.5 million target for 1971. Requests for technical assistance (experts and equipment) under the Agency's Operational Budget amounted to \$3.6 million for 1971.

57. The "Report on IAEA Activities in some Central American Countries"[7] and a report entitled "Observations on the work of the International Atomic Energy Agency in Burma"[8] are the only reports by the Joint Inspection Unit which relate specifically to Agency activities. They were brought to the Board's attention with the Director General's comments thereon. During the year the Board was informed of several other reports which had been received, and the Unit's annual report on its activities from July 1969 to June 1970 was distributed.

[7] United Nations document JIU/REP/70/5-5.

[8] United Nations document JIU/REP/71/1-1.