CURRENT WORK AND FUTURE TRENDS

IAEA REPORTS TO ECOSOC

The present and future role of the International Atomic Energy Agency is outlined in two recent reports submitted by the Agency to the United Nations Economic and Social Council. One of them is the Agency's annual report to the Council covering the period 16 April 1959 to 15 April 1960 while the other, containing an appraisal of likely trends in the future, is a document specially prepared for the Appraisals Committee of the Council.

The annual report states that during the past year there has been "a steady growth" in most of the Agency's programmes - both in the interest of the Agency's membership as a whole and for the benefit of individual Member States. About the prospects of nuclear power, it says: "If there has been a deferment of short-term expectations it is probably because earlier appraisals underestimated 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". The Agency, in the meantime, is helping its less developed Member States in preparing for the eventual introduction of nuclear power by economic and technical studies as well as by various forms of technical assistance, training and exchange of information.

Activities concerning the supply of nuclear fuels and equipment are increasing. The supply of three tons of natural uranium to Japan was completed last year, and negotiations have been going on with the Soviet Union and the United States for the supply of enriched uranium to Finland. Enquiries from other countries about fuel supplies are being considered. Arrangements have also been made for the supply of a reactor to Finland from the United States.

Radiation and Radioisotopes

Applications of radioisotopes and radiation to industry, medicine and agriculture, which will play a useful role in the economic and social advance of the less developed countries, forms an important part of the Agency's research, information and technical assistance activities. An international directory of radioisotopes has been published, and several scientific meetings, including a conference in Warsaw on the application of large radiation sources in industry, have been held on the uses of radiation and radioisotopes in different fields. Training in radioisotope techniques is being arranged not only by the grant of fellowships but also by short-term training courses. Research contracts awarded by the Agency have included several on the uses of isotopes; the Agency has also encouraged research to find a cheaper method of producing the isotope calcium-47 which is particularly valuable in the medical field. Other possible developments to which attention is being paid include the employment of radioisotope tracer techniques in hydrology and food preservation by irradiation. A survey of existing industrial applications is also being planned. A major conference on the use of radioisotopes in the physical sciences and industry will be held in Copenhagen next September.

Simultaneously with promoting the applications of radiation and radioisotopes, the Agency is establishing standards of safety for protection against radiation and formulating measures for their observance. Following the work of a panel of experts, a manual on the safe handling of radioisotopes was published last year, while two other panels have gone into the requirements for the safe transport of radioactive substances. The problem of radioactive waste disposal has been considered not only by an expert panel but also at a large scientific conference held in Monaco. Numerous contracts have been placed with scientific institutes in different countries for research in fundamental radiobiology and radiation protection. The results of a study of the hazards arising from the radiostrontium contamination of the biosphere will be considered by a panel of experts this year, and it is expected that this will be followed by increased work on an experimental evaluation of the margin of safety in the currently accepted maximum permissible concentration of strontium-90 in the human body. The Agency is also planning to help its Member States by undertaking, at their request and within certain limits, the measurements and analysis of samples to determine the degree of environmental contamination by radioactivity.

Experts, Equipment and Training

The number and variety of requests for technical assistance has "exceeded expectations". Previously, the resources that the Agency had at its disposal for meeting these requests were derived from voluntary contributions to its General Fund and from offers by Member States of experts, equipment and fellowships. Beginning with 1959, funds were made available to the Agency through its participation in the United Nations Expanded Programme of Technical Assistance. As in 1959, the target of voluntary contributions to the General Fund in 1960 is US $1 500 000, of which $944 937 had been pledged by 15 April. Donations in the form of fellowships, equipment and services of experts have also been substantial. The United States has offered equipment for technical assistance projects up to a value of $200 000. In 1959, the Agency received a special allocation of EPTA funds amounting to $187 000, while an additional $165 264 were made available to permit the financing of some urgent requests.

With increasing resources, there has been a considerable expansion of the Agency's programme of assistance, including training and exchange of scientists. 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. Under the 1960 programme, 570 nominations for fellowships had been received from 37 countries by 15 April. On request, the Agency has arranged for visits of teaching personnel to give courses in nuclear science and technology and for the exchange of specialists to hold courses in special research techniques. In addition, a training course on radioisotope techniques was held at Cornell University, USA, and a course on the application of radioisotopes in agricultural research in New Delhi, India. Further courses are planned for this year. Extensive use is also being made of two mobile radioisotope laboratories.

Holders of IAEA fellowships at the Argonne National Laboratory, USA. They are, second and third from left, Dr. Sayed Hassan Hilal from the United Arab Republic and Dr. Panpit Pansuwana from Thailand

At present, the Agency is meeting requests from 23 countries for 65 experts and supplying equipment to 17 countries. Requests for the services of 32 field experts were approved last year; by the end of June, six of them will have completed their assignments while most of the others will be in the field. Requests for equipment and technical supplies, valued at a total of $125 000, were approved last year; under this year's programme, requests have been received for equipment and supplies worth about $500 000. In 1959 four composite missions were despatched to different regions to survey the prospects of atomic development and the needs for Agency assistance; two such missions had been sent out in 1958. Thirty-six countries have so far been covered by these missions, while smaller teams have visited several other countries in response to specific requests.

In the Years Ahead

While the annual report to the Economic and Social Council contains a record in broad terms of how the Agency has expanded its activities in pursuance of its statutory objectives, an appraisal of the prospects of growth over the next five years has been attempted in a separate report submitted by the Director General to the Appraisals Committee of the Council. A precise forecast, of course, cannot be expected. Many uncertainties are inevitable because of the rapid technological change; the inadequacy of operating experience is also a limiting factor; and finally, the needs of the Agency's Member States have yet to be ascertained with a reasonable degree of accuracy. The appraisal is based on a study of the trends that have emerged so far.

It is natural that at the present stage particular stress should be laid on work in connexion with research and development and health and safety, as well as on surveys of national resources and needs and on the training of technical personnel. This is in anticipation of wider and more concrete development of atomic energy work in the Member States. As national programmes advance and more trained personnel become available, there will be a gradual change of emphasis from work of such general character to assistance to specific projects.

An assessment of national resources and needs is likely to be completed within the next few years and the trend will be towards more surveys in specific fields. Two or three requests for intensive studies and assistance in relation to specific power projects are likely to be received during the next five years. Specialized missions will also be sent to survey needs for assistance in the uses of radioisotopes and help Member States in planning their programmes.

In the field of training, the likely trends are as follows: applications for fellowships to grow during the next two or three years until about 700 - 800 applications are received each year and to remain at about that level for some time; requests for visiting instructors to increase from the five received in 1959 to about 20 - 30 a year by 1964; more exchanges of atomic scientists between Member States to take place; the number of Agency-sponsored training courses to increase steadily; and lastly, the Agency to be called upon to an increasing extent to assist in the establishment of regional training centres.

It is thought unlikely that the Agency will undertake or finance major research on nuclear power in the near future. In thermonuclear research, however, it is expected to become the international focal point for the exchange of information. Research will be necessary on problems concerning the production of certain radioisotopes and labelled compounds, on the use of isotopes in investigating biological processes, on the development and application of large radiation sources, and on the effects of radiation on man and his environment. The Agency is likely to continue to promote research into these subjects by

awarding research contracts, holding meetings on specific topics and collecting and diffusing information.

Most of the work on basic standards and regulations in respect of health and safety will be completed by the end of 1960. Work in connexion with waste disposal will include general studies on waste treatment and containment and surveys of problems raised by disposal operations.

Assistance to Individual States

While these activities concerning health and safety will be of interest to all Member States, the Agency will also be called upon to undertake an increasing amount of work in dealing with problems in individual Member States, particularly in the less developed areas. Assistance will first be required in providing safety evaluations and services to users of isotopes and radiation sources, and thereafter to research reactor projects. Later, such services will be needed for power reactor projects. Work is also being undertaken on general supervisory measures to ensure the safety of atomic energy plants. It is further planned that the Agency should serve as a co-ordinating centre for providing emergency aid in the event of radiation accidents.

The Agency's work in promoting international action in connexion with civil liability and state responsibility for nuclear damage will increase.

The Agency's scientific information services will continue and expand more or less on present lines. So far as the scientific conferences are concerned, the programme will mostly consist of relatively small meetings on specific subjects. It is also expected that more meetings will be held on a regional basis in the less developed areas.

In the field of nuclear power, the Agency is likely to receive an increasing number of requests to arrange hazards evaluations of new types of reactors that are being evolved. Secondly, as a sequel to the current survey of the nuclear power needs of the less developed Member States, plans for a number of power reactor projects may be well advanced in the course of the next five years. It is expected that the Agency will have the role of major promoter of a small number of such projects, and may assume responsibility for supplying the fuel. It is also likely to undertake fuel supplies for a number of reactor projects undertaken by Member States without any other help from the Agency. And when the Agency supplies fuel, it will normally have to assume responsibility for applying health and safety measures and safeguards against diversion.

The Agency will continue to stimulate and assist research on the use of radioisotopes in increasing food production, and provide technical assistance to enable wider introduction of radioisotope applications in industry in the less developed areas. In medicine, it will try to overcome the difficulties which stand in the way of making full use of radioisotope techniques in diagnosis, therapy and clinical research. Its assistance will be available in training, in the installation of equipment and facilities and in the application of protective measures; it will also try to promote clinical research on diseases prevalent in the less developed areas.

The laboratory services given by the Agency in its present small headquarters laboratory and its larger laboratory now being built near Vienna, will be governed by the needs of its other operational programmes. At the same time, the latter is expected to become in due course a useful international centre for the training of scientists from the less developed Member States which cannot provide such training facilities.

The Austrian Federal Chancellor, Dr. Julius Raab, (at the centre) visiting the IAEA laboratory building at Seibersdorf, near Vienna, on the completion of a stage in its construction. He is seen talking to the Director General, Mr. Sterling Cole, and on his left is Dr. Henry Seligman, Deputy Director General in charge of Research and Isotopes