Technical Assistance in Latin America

by A. Oteiza-Quirno

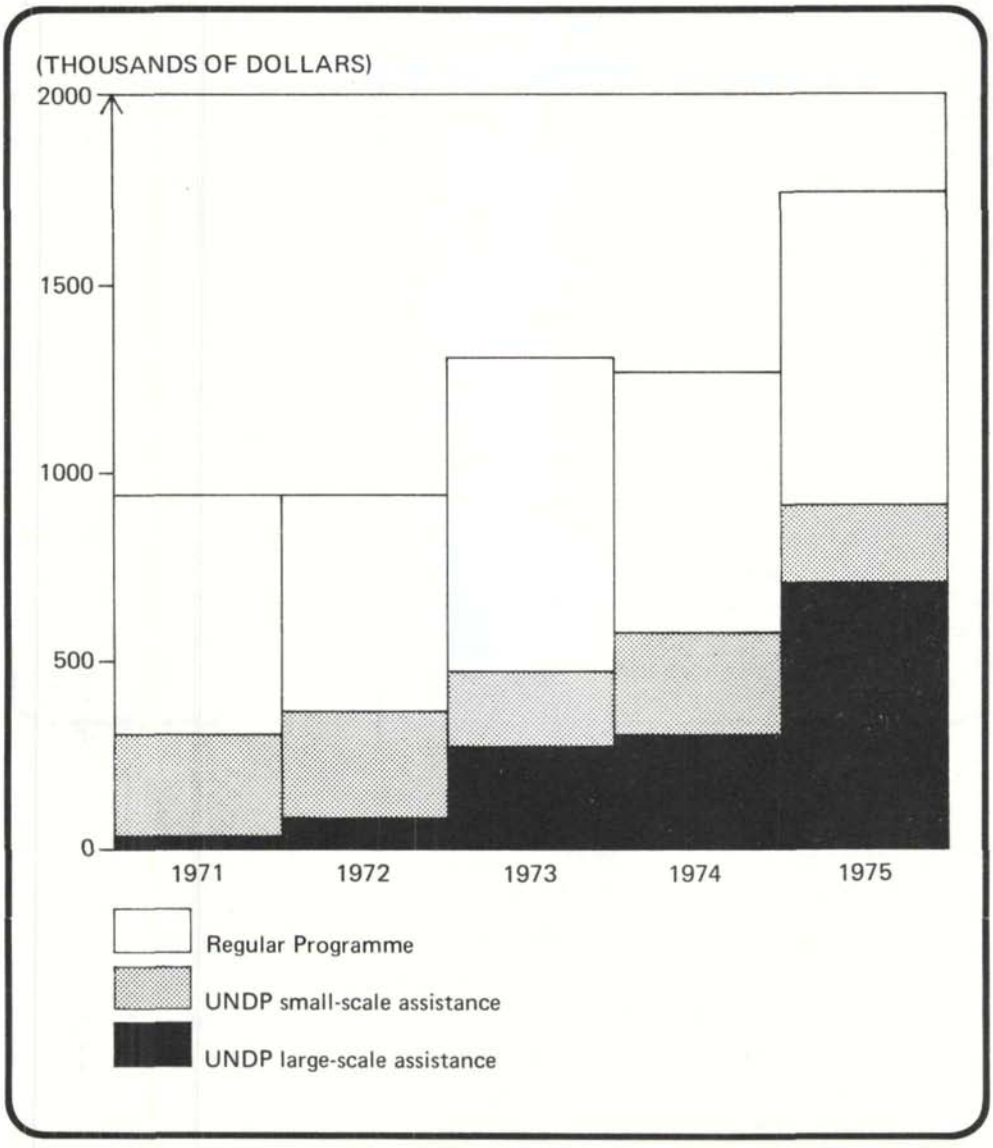
Mr. Oteiza-Quirno is Head of the Section for Latin America, Division of Technical Assistance.

Previous articles in the *Bulletin* have covered the technical assistance given by the IAEA to developing countries in other regions of the world. As in the other regions, nuclear technology development in Latin America reflects mainly the degree of technological development already existing in each country. It is quite significant that in nearly all countries in Latin America the medical profession has been the first to show interest in using nuclear techniques. As a result, a country such as Uruguay has become a source of recruitment for technical assistance experts in nuclear medicine to other developing countries, while at the same time it continues to receive assistance for new sophisticated techniques from the IAEA. Part of this assistance, in turn, comes from the neighbouring countries, Argentina and Brazil. For example, an expert from Uruguay is currently assigned under an Agency programme to Costa Rica, El Salvador and Guatemala, and experts from Argentina and Brazil have been sent to Uruguay. This is an example of "horizontal" development, meaning mutual assistance between developing countries under programmes supported by the United Nations Agencies, which is now being emphasized by the United Nations Development Programme (UNDP).

Still in the field of nuclear medicine, another significant model is provided by Bolivia. With assistance from the IAEA, and thanks to the availability of a good professional infrastructure in that country, a net of nuclear medicine services has been started, consisting of a well-developed nuclear medicine centre in La Paz and regional centres in Cochabamba, Sucre and Santa Cruz. Because of its great variations in altitude, Bolivia is in the position of being able to conduct research on the adaptation of man to diverse environmental conditions. The Agency has contributed, and continues to do so, to these programmes by sending experts, providing for training abroad of Bolivian doctors under its fellowship programmes, and providing basic equipment for all four centres.

What has been said in connection with the field of nuclear medicine could be repeated for the many other applications of nuclear technology in agriculture, industry, hydrology and basic sciences, but it is more interesting, perhaps, to look at some recent developments in Latin America which are significant in so far as they seem to indicate the role of the IAEA in providing technical assistance throughout the world.

The 1973 energy cost crisis has had, of course, great impact on the region, which, with a few exceptions, is not especially rich in conventional energy and fuel resources. A sudden realization of the need to define a national nuclear policy was reflected in urgent requests to the IAEA for advice on the legal and institutional infrastructure needed both to define national policies and to implement them. Requests in this field are very different from the usual demands for specialists in narrow scientific fields, which had been predominant in the preceding period. They have resulted in an unexpected number of special assignments and arrangements and have demonstrated that the IAEA is able to meet new challenges.



Contribution of the United Nations Development Programme to the IAEA's total technical assistance to Latin America.

Technological Applications of Nuclear Energy

Under this name, a UNDP-financed, large-scale project has been in operation in Chile and will continue until the end of the current year. The purpose of the project is to concentrate in a comparatively short period, and in a co-ordinated way, the assistance required to put the first research reactor centre of the country into operation. Experience had shown that in similar cases it normally takes many years to bring such a centre into

TECHNICAL ASSISTANCE TO LATIN AMERICA BY FIELD OF ACTIVITY: 1971–1975
(IN THOUSANDS OF DOLLARS)

Year	0	1	2	3	4	5	6	7	8	9	TOTAL
1971	8.7	145.3	30.3	115.5	224.8	124.9	89.7	33.3	102.3	70.7	945.5
1972	17.8	93.3	119.2	127.1	92.2	136.3	116.2	34.7	159.7	52.9	949.4
1973	26.5	97.8	93.7	108.8	250.9	361.8	136.7	13.1	167.1	48.7	1305.1
1974	34.0	128.5	89.1	88.5	162.6	318.4	160.6	19.4	202.9	59.3	1263.3
1975	276.5	122.2	169.4	258.1	191.2	424.6	81.8	20.3	146.8	48.1	1739.0
Total	363.5	587.1	501.7	698.0	921.7	1366.0	585.0	120.8	778.8	279.7	6202.3

0 – General atomic energy development
1 – Nuclear physics
2 – Nuclear chemistry
3 – Prospecting, mining and processing of nuclear materials
4 – Nuclear engineering and technology
5 – Agriculture
6 – Medicine
7 – Biology
8 – Other fields
9 – Safety in nuclear energy

optimal operation so that it could start producing the results and services that could justify the expense incurred. This first effort on the part of the Agency to implement a co-ordinated, multi-disciplinary programme has been highly successful and can be taken as a model to be followed in other countries that decide to take a major step in organizing a complex nuclear applications programme.

In Chile, the IAEA has helped to launch a radioisotope production programme, establish an adequate radiation protection service for the research centre as well as for users of radioactive materials, develop a programme of application of nuclear techniques in hydrological studies, organize a national co-ordinated system in nuclear medicine, improve the dosimetry of radiation in medical applications, promote the industrial utilization of nuclear techniques, establish a pilot multi-purpose gamma-irradiation facility and carry out studies in food irradiation. In addition the IAEA project has helped in reactor studies, mainly in the field of thermohydraulics. It has also included assistance in activation analysis, and production and control of radiopharmaceuticals. It has given support to courses organized by the Chilean Nuclear Energy Commission, which promote the use of nuclear tools outside the Commission. The courses have also proven useful as a means for selecting scientists and engineers for recruitment by the Commission for its own programmes. The training component of the project, supplemented by the IAEA's fellowships and training programme, has been used to train a comparatively large number of engineers, both from the Commission and the utilities, who will constitute the counterpart team for a new UNDP project on nuclear power, scheduled to start in 1977.

Nuclear Manpower Training and Management

The problems connected with the demand for highly specialized staff in expanding nuclear programmes have been recognized by Brazil, and studies were initiated by NUCLEBRÁS to identify the need for the number of persons to be trained, kind of training, career development and general management requirements. Brazil asked the Agency for assistance in developing this project, and preliminary work, financed by UNDP, has been carried out. A much larger project is under preparation by a joint Brazilian/IAEA team. For the new project, more than US $2 million have been reserved in the UNDP Country Programme for Brazil for 1977–81.

Co-ordination of Large-scale Projects

Another new technical assistance situation for the IAEA has emerged recently in Peru, where the Government has assigned high priority to the development of a series of nuclear programmes simultaneously. The detailed planning has been made with assistance from an expert appointed by the Agency under its regular programme. Provision for four large-scale projects has been included in the UNDP Country Programme for Peru for 1977–82. The Agency expert has helped prepare detailed requests, in consultation with Agency staff, and this has made it possible to start advance preparations for early implementation of future assistance. In view of the size of operation, and the need for a close co-ordination, the Government of Peru, the UNDP and the Agency are considering the possibility of having a field adviser appointed by the Agency and financed by UNDP.

Power Reactor Safety

Three countries in Latin America are building nuclear power plants: Argentina, which already has one plant in operation at Atucha, Brazil and Mexico. In the latter two countries the construction of a second nuclear power plant is in an advanced stage of planning. Through the Agency's technical assistance programmes, it has been possible to provide a flexible and quick series of advisory services at successive stages, covering such questions as siting, safety evaluations, construction permits, quality assurance, etc. The assistance has been delivered by teams of experts acting for a short period, or by individual experts with longer assignments. In this way the total number of man/months of approved assistance is made available for gradual use in the way more appropriate for each situation. This approch will probably be needed more frequently in the near future, as other countries, such as Chile, Cuba, Peru and Venezuela, enter the nuclear power field.

Participation of National Industry

Under a UNDP project, the IAEA assisted Brazil, a few years ago, to make a survey of possibilities and to identify the problems that would have to be overcome to optimize domestic participation in the nuclear power programme. In Argentina, where a policy was defined at an early stage, the Agency through several small projects has been assisting in technological research and development work, mostly in the metallurgical field. At present, a UNDP large-scale project for the establishment of a National Institute for Non-Destructive Testing and Quality Control, under the National Atomic Energy Commission, is underway in Argentina. Because the techniques involved are not only nuclear, assistance is being

given jointly by the IAEA and the United Nations Industrial Development Organization (UNIDO). This was the first joint technical assistance project by the two organizations.

Uranium and the Fuel Cycle

The search for uranium is now a first priority programme in many of the countries in Latin America. Some had already carried out surveys for many years, but the new world demand and future prospects have given emphasis to the need for intensifying prospecting for uranium with the aid of improved modern techniques. Assistance is being given at present to nine countries in Latin America, including a large-scale UNDP project in Chile. Another UNDP large-scale project, which should start in 1977, is being planned in Peru.

In Argentina, where a uranium deposit at Sierra Pintada (Mendoza) had been evaluated for development by the National Atomic Energy Commission, the Agency was asked to carry out a review of the feasibility study which the Commission has prepared, with a view to obtaining the necessary financing for the engineering and mining. The project, which was financed by the UNDP, was subcontracted to a private firm after an international call for tenders, and resulted in a report that basically confirmed the conclusions of the feasibility study.

A considerable number of IAEA technical assistance projects are being implemented in Argentina, Brazil and Mexico in connection with successive stages of development of a nuclear fuel industry: mining, ore processing, refining, fuel fabrication, cladding, zirconium technology, analytical support and reprocessing.

Assistance to Smaller Programmes

Independently of the cases described above, the IAEA has implemented or is implementing a considerable number of projects to support smaller programmes of the application of nuclear techniques. In all, 17 Latin American countries are receiving Agency assistance and this number is expected to increase to 20–22 in the next three to four years. The Agency attaches importance to the need to keep an adequate balance between the demands for large and sophisticated projects, which require a major effort to implement, and the continuation of the smaller assistance projects, which are of vital importance for health programmes, agricultural research, universities and research centres.