



The Nuclear Center of Mexico opened in 1965.

## Report from Mexico: INIS and its impact on nuclear power development

*The country has established a co-operative information network*

by Pedro Zamora and Octavio Ibarra

Scientific and technical information, and its contribution to human knowledge, is probably the elemental clue in distinguishing highly developed countries from less developed ones. Countries that are defined as rich or developed and as poor or less developed can also be defined nowadays as rich in information or as poor in information.

It is difficult to believe that Mexico, as well as other Latin American countries, could have developed their nuclear programmes without support and international co-operation from developed countries, in this case by means of the International Nuclear Information System (INIS).

The impact of INIS services on nuclear programmes in Mexico, as in any other country, has depended upon the size and quality of programmes, the development of the scientific infrastructure, and on the progress achieved in extending INIS services to the research community and higher educational institutions. As a member of INIS since 1969, Mexico has been diligent in the promulgation of its services.

In our view, INIS has achieved great success in the field for many reasons: it harnesses bibliographical production; it allows all participating countries to have

an equal share in the formulation of policy and in management; it makes information from one member available to all; and, to an equal extent, it promotes free exchange of specialized literature between countries and also with the Agency itself.

Since 1959, Mexico has been a depository for official publications of the principal Member States of INIS. The developed countries, without exception, have demonstrated international co-operation through their massive contribution to Mexico, for which the country extends its sincere gratitude.

### National nuclear institutions

Mexico — in the conviction that its wealth in reserves is the common dominion of the nation — has firmly stood by its decisions of 1938 to nationalize its natural resources. As the need arose, legislation has been enacted toward the rescue of its mineral reserves. The exploitation of ores of radioactive materials, such as uranium, thorium, and actinium, also comes under national legislation.

The governmental agencies established to regulate, protect, and develop nuclear materials have, through necessity, evolved over the years. The first of these, born in 1955, was the Comisión Nacional de Energía Nuclear (National Nuclear Energy Commission). In 1972 it was recreated as the Instituto Nacional de

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Energía Nuclear (National Institute of Nuclear Energy). In consequence of rapid advancements and growth, this Institute was replaced, in 1978, by three separate entities to carry out its vast functions: Instituto Nacional de Investigaciones Nucleares (National Institute of Nuclear Research); Comisión Nacional de Seguridad Nuclear y Salvaguardias (National Nuclear Commission for Safeguards and Safety), and Uranio Mexicano (Uranium of Mexico). However, in 1985, under the Nuclear Affairs Regulatory Provision of Constitutional Article 27, Uranio Mexicano, which has as its special charge the exploration, exploitation, milling, and mining of uranium-bearing metals, ceased to exist. Its duties were assumed by the Comisión de Fomento Minero (Commission of Mining Development) and by the Consejo de Recursos Minerales (Council of Mineral Resources). Both of these institutions existed previously. A Comisión de la Industria Nuclear (Commission of Nuclear Industry), which was set up at the time, was entrusted with all the operational phases of the nuclear fuel cycle.

### Nuclear energy pioneers

The roll call of the forefathers of nuclear energy in Mexico is large. At the beginning are the names of its three pioneers: Dr Manuel Sandoval Vallarta, Dr Nabor Carrillo, and Dr Carlos Graef Fernández, internationally renowned men of science who were equally eminent as educators and statesmen. Recognition must be given, as well, to Lic. Salvador Cardona, illustrious legislator who established the legal framework for the Mexican nuclear law.

### Nuclear research activities

In the 1950s, interest was awakened and study stimulated in theoretical and applied nuclear research at various centers of higher learning throughout the Republic. Examples are research works on sub-atomic particles carried out mainly at the Universidad Nacional Autónoma de México (National Autonomous University of Mexico) and the Instituto Politécnico Nacional (National Polytechnic Institute), and at the Facultad de Química de la UNAM (School of Chemistry), a pilot plant for the milling, refining, and conversion of uranium-bearing materials.

At the national level co-ordination of nuclear research is under the responsibility of the Instituto Nacional de Investigaciones Nucleares (ININ). Its dual task under the law is for planning and implementing research and development in the field of nuclear science and technology in the promotion of atomic energy's peaceful uses, and for disseminating information on advances in nuclear science, with a view toward its application to the economic, social, scientific, and technological progress of the country.

When in 1965 el Centro Nuclear de México (Nuclear Center of Mexico) opened, an end had come to the proliferation of scattered research institutions. Its large-

scale research center — equipped with a Triga Mark research reactor, a Tandem particle accelerator, and specialized advanced instruments and equipment — was a place where research scientists and technicians could probe into the multiple aspects of the nature of atomic energy and its uses.

With the arrival of the Nuclear Center, the Mexican research endeavour rose, often to the height of the Center's capability, and ties were solidified with institutes of higher learning and industry requiring the support of nuclear technology.

A short time thereafter, specialized and advanced studies in many nuclear fields, hitherto sought abroad, became a reality at home. Post-graduate programmes in nuclear science were set up at the National Polytechnic Institute and at the National Autonomous University of Mexico. Following close behind, state universities soon incorporated into their programmes degree studies in nuclear science. Notable among them were the State universities of Zacatecas and Nuevo León.

Mexico's decisive step for its energy programme began in 1966, when the Government decided to build two 650-megawatt nuclear reactors. The first one will be connected to the electric power distribution network in 1987.

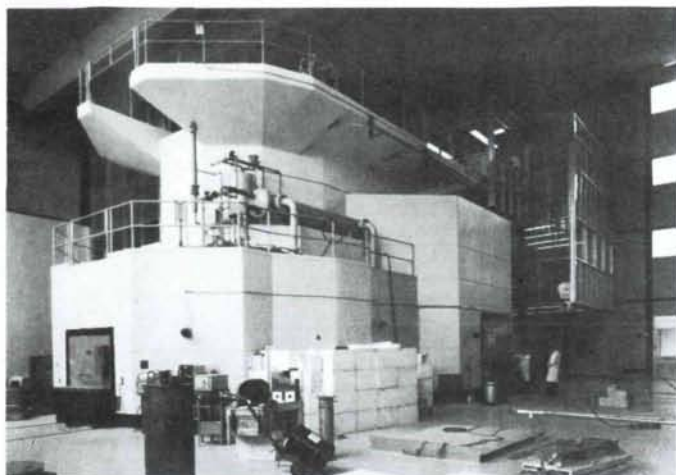
Within the national energy programme, some important goals have been established: (1) satisfaction of the national energy demand; (2) efficient methods of energy utilization; (3) diversified sources in the production of energy; and (4) strengthening the scientific and technical infrastructures. It is expected that nuclear generated electric power will sizeably contribute to the attainment of these benefits.

As a signator of the Treaty on the Non-Proliferation of Nuclear Weapons, Mexico has committed itself to the peaceful uses of atomic energy. But even before signing this pledge, our national statesmen had struggled for the prohibition of nuclear weapons. For his part at the forefront of the global struggle to ban nuclear weapons, our statesman Alfonso García Robles was awarded the Nobel Prize for Peace in 1984. Needless to say, our nuclear research is directed only to peaceful applications.

Inside view of Mexico's Nuclear Information and Documentation Center.







Triga Mark research reactor at the Nuclear Center of Mexico.



Laguna Verde nuclear power plant.

### Scientific and technical information services

By national decree, the Centro de Información y Documentación Nuclear (CIDN) (Nuclear Information and Documentation Center, of the National Institute of Nuclear Research) is in charge of gathering, analysing, and publishing nuclear information and developments for the benefit of nuclear research institutions and the peaceful applications of nuclear science.

INIS has been a basic element behind the quality and development of CIDN services. Parallel to the technological development and to the creation of research programmes, bibliographic collections were increased. They now encompass a wide specialized collection on nuclear science and technology, as well as technical and economic aspects of alternate sources of energy. Nuclear science abstracts — as predecessors of INIS — should be given recognition for their role in providing research access to earlier nuclear literature. Similarly, valuable information on nuclear matters is available through energy research abstracts stressing all aspects of energy.

Considering the interdisciplinary characteristic of nuclear energy, Mexico's information services are based on international databanks on science and technology in general, and specifically, on nuclear science and technology, of which INIS is the main support.

Dissemination of INIS information is done through the Selective Dissemination of Information Services (SDI). Since 1975, magnetic tapes from INIS and, since 1981, on-line access to the IAEA in Vienna, have been used. Regular recipients of information are members of the National Institute of Nuclear Research, the National Commission of Nuclear Security and Safeguards, the nuclear power plant of Laguna Verde, and other institutions in the nuclear sector. Information and collaboration services also are provided to institutions in the energy sector and to research and higher education institutes related to nuclear science and technology.

Mexico's advanced and higher education institutions can improve their teaching methods and levels of research qualitatively only through the utilization of updated information, a product of the continuous interaction of science innovations nationally and internation-

ally. Toward this end, the Nuclear Information and Documentation Center (CIDN), jointly with the Research and Advanced Education Undersecretariat Office, organized in 1981 the First National Meeting on INIS Services, with the purpose of offering INIS services and CIDN's existing nuclear information. Attending were 65 representatives of Mexico's main institutions related to nuclear science and technology and its peaceful applications.

In 1980, CIDN produced a video tape on INIS and its services in Mexico. By special bilateral agreements, Mexico, through CIDN, has offered its services of co-operation to Chile, Cuba, Ecuador, Guatemala, and, most recently, Uruguay by petition of the IAEA.

### Benefits of INIS

In Mexico, the impact of INIS services on nuclear research and development activities has been highly satisfactory. INIS has played a decisive role in the organization of nuclear information and documentation services at the national level.

Since democratic participation of the industrialized and developing countries is integral to INIS, it has allowed less developed countries to efficiently use nuclear information, no matter the stage of development. Each country, according to its stage and needs, can participate and use the required information.

Mexico and most countries of Latin America, however, have extremely limited capabilities and resources, both financial and human, to devote to their nuclear programmes and information services. It is necessary to find additional solutions for regional co-operative assistance. Some examples are ARCAL of IAEA's technical co-operation programme and the INFORCIEN project of the Organization of American States and Brazil.

The INIS programme of training courses also plays an increasingly vital role within developing countries. This stems from the fact that the level of participation and capacity of each country to advantageously use the information services and resources of industrialized countries revolves, to a large extent, around INIS.