

Argentina offers 'South-South' cooperation on nuclear energy

by Cynthia Rush

Argentina's Vice-Admiral Carlos Castro Madero, the director of that country's National Atomic Energy Commission (CNEA), reported at the early-November Second International Conference on the Transfer of Technology in Buenos Aires that his government was discussing the transfer of nuclear technology to several Ibero-American nations. Emphasizing that all nations have the "unquestionable right" to develop independent nuclear programs. Castro Madero charged that "unequal scientific-technological development had created . . . a kind of neo-colonialism, through dependence on critical materials . . . which affects the sovereignty of each state."

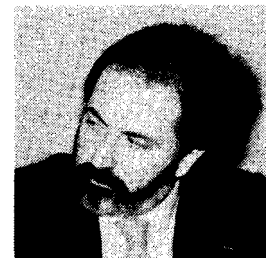
With the most advanced nuclear program in Ibero-America, Argentina is well situated to make this offer. As detailed in the following article written especially for *EIR* by Luís Fernando Calviño of *Energeia* magazine in Buenos Aires, the Argentine government consciously set out to develop its nuclear program in the late 1940s with the understanding that it would be a vital safeguard for its national sovereignty. The program suffered the ravages of violent monetarism imposed by pro-British Finance Minister José Martínez de Hoz (1976-81), and has also come under increasing attack by Malthusian forces who have come to inhabit the U.S. Congress in recent years. Nonetheless, Argentina's CNEA is committed to advancing the program, if not in collaboration with the United States, then with the nations of Europe or the developing sector.

The CNEA recently signed a letter of intent with Colombia's Institute of Nuclear Affairs whereby it offers to provide that country with an experimental reactor, build a plant for the production of radioisotopes, and a pilot plant for treatment of radioactive minerals. The CNEA will also help train Colombian personnel.

Agreements for nuclear cooperation also exist with Peru, and according to Castro Madero there have been "several requests" from other Ibero-American nations seeking similar agreements. Unlike agreements offered by some advanced sector nations, Castro Madero reported that Argentina will

sell technology on terms that do not constitute "an additional financial burden" on those countries.

Mr. Calviño, who is a member of the Buenos Aires chapter of the Club of Life, is currently the interim director of *Energeia* magazine. He also works as a researcher at the Fundacion Latina in Buenos Aires, and teaches courses in political science and international affairs at the Universidad del Salvador. Part I of his article details the beginnings of the Argentine nuclear program and its development through the end of the 1960s. The conclusion will appear in a future issue of the *EIR*.



Luís Fernando Calviño

Courtesy of *Energeia*

Argentina's nuclear plan: history and perspectives

by Lic. Luís Fernando Calviño

Argentina's interest in nuclear energy dates from 1945, barely a month after the atomic explosions at Hiroshima and Nagasaki. At that time the Ministry of War issued a decree ordering the preventive conservation of existing national uranium deposits. Nonetheless, the period from then until 1950 can really only be considered the pre-history of Argentina's

nuclear development. For purposes of analysis, the evolution of Argentina's nuclear development can be broken down into three basic periods: 1) the gestation period (1950-1966); 2) the consolidation period (1966-1976); and the expansion period (from 1976 on).

The gestation period

This stage began on May 31, 1950 with the creation of the National Atomic Energy Commission (CNEA), whose authorized functions were the promotion and control of official and private research, drafting of proposals for the national government on the protection of the population from the effects of radioactivity, and measures to ensure the proper use of atomic energy. It also noted the inalterable objective of using this energy source for peaceful purposes.

In the years that followed, other complementary organizations to the National Atomic Energy Commission were created, among them the National Atomic Energy Laboratory under the direction of Dr. Ronald Richter; uranium resources began to be systematically exploited through Fabricaciones Militares [the state-run military industries enterprise—ed.] to study treatment technology and use of radioisotopes for medical and occasionally, industrial applications.

In 1953, when President Eisenhower launched his "Atoms for Peace" program, Argentina and the United States signed the first agreement for cooperation in the peaceful application of nuclear energy, including a commitment to exchange information on design, construction and maintenance of research reactors. This agreement was possible thanks to changes in the Atomic Energy Act in 1954.

The decisiveness with which the Peronist government took up initiatives related to nuclear development during those years—a period of truly pioneering efforts—was responsible for the fact that at the United Nations-sponsored International Conference on Atomic Energy for Peaceful Purposes in Geneva in 1955, Argentine professionals presented close to 40 projects.

When the Peronist regime was overthrown in 1955, the government decreed an important basic standard which remains in effect today. Decree 22.477 established that while uranium resources could be exploited and industrialized by private concerns, the state retained ownership of the mines and minerals.

In the framework of a bilateral agreement signed with the United States, construction of the RA-1 reactor was begun in 1957, and inaugurated one year later at the Constituyentes Atomic Center. Its design was that of the U.S.-built "Argonaut" 100 Kw reactor. Through the U.S. Atomic Energy Commission, the CNEA had obtained 36,248 Kg. of 20 percent enriched uranium oxide, and agreed to pay \$5,000 annually for its leasing. According to the agreement, the uranium oxide would also be returned to the AEC.

This was the first reactor in Latin America to reach this critical stage—on January 20, 1958—and was the first dem-

onstrated of feasible autonomy in an international context for that period. Rather than acquiring a reactor from abroad, as many others had done, Argentina resolved to build its own.

After the completion of RA-1, RA-0 was built and is currently used for teaching purposes at the University of Córdoba. Together with the RA-2, this reactor helped in gathering information on the design of the reactor core and acquiring experience in increasing the potency of RA-1 to 150 Kw, leading to the construction of RA-3—without foreign aid. The latter also required enriched uranium, but unlike earlier cases, it was enriched at 90 percent. The reactor was built for purposes of experimentation and production of radioisotopes, and is located at the Constituyentes Atomic Center.

This stage was characterized by a commitment to adequate administrative infrastructure and the development of research reactors, thanks to changes in U.S. legislation which permitted the release of information pertaining to specific areas of nuclear development. Transfer of technology relating to any stage of the fuel cycle had always been previously prohibited.

The period of consolidation

In 1965, the CNEA defined projects of even greater scope. In 1966, it proposed to the national government a 'Pre-Investment Study' for the construction of a 500 Mw nuclear facility for installation in Zarate or Magdalena in the province of Buenos Aires, that would supply electricity at a cost somewhere between \$90 and 100 million dollars.

The decision-making process which culminated in the awarding of the contract to Siemens Corp. is a clear example of the benefits of knowing the international nuclear system in depth, so as to gauge the margin of maneuverability in terms of what is desirable and what is possible, in the area of autonomous nuclear development.

The CNEA promoted the natural uranium line as the most convenient for Argentina, as it would facilitate the development of a fuel cycle independent of foreign sources, providing the country possessed enough uranium resources to meet its own needs.

While the establishment of a domestic enrichment process was rejected because of its high cost, it was emphasized that any international agreement with the sole supplier—the United States—would be subject to political contingencies that would affect the functioning of the reactors built and operated in the country.

Hence the great international interest in heavy water reactors; it was determined that programs of this nature existed not only in Canada and Sweden, but also in Germany, Spain and Czechoslovakia. Although what stood out at the time was the country's limited experience in this field, the government also foresaw the great potential for development, taking into account the capability of Argentine technicians and industry to keep pace with such a project. After determining

that the HWR offered the greatest potential for future perfection, it was pointed out that since the nuclear development of other countries tended toward use of the fast-breeder reactor, which produces more plutonium than it consumes, the HWR line would be most appropriate to supply these as it produces the greatest amount of plutonium as a residue.

Finally, it was determined that the heavy water line of reactors could be established in the future with the greatest degree of participation by national industry.

Ten offers were presented, although a discrepancy developed between those who supported the natural uranium option (the CNEA and the National Security Council), and those who opted for enriched uranium (the Secretary of Energy & Mining).

The CNEA backed up its position with technical arguments; from the national security standpoint it was decided that it would be better to assume the risk implied in the selection of a research reactor if that guaranteed the country's technological development without foreign "umbilical cords," particularly with the perspective of supplying plutonium to breeder reactors.

But political considerations also entered into the final decision, given that both Argentina and the Federal Republic of Germany—the country awarded the contract—held similar positions regarding non-proliferation. The German position on the Non-Proliferation Treaty coincided on several points with the Argentine stand in the negotiation of the Tlatelolco Treaty (the "denuclearization" of Latin America), especially with regard to rejecting all types of discrimination and having recourse to peaceful nuclear explosions.

The political factors were such that the final decision tended toward a 319 Mw reactor, instead of the projected 500 Mw one, with the stipulation that Siemens' sole experience in this area was the 50 Mw reactor at Karlsruhe. It was preferable to pay the cost of an additional 180 Mw and assume the risk of advancing a prototype reactor to industrial scale, provided the necessity of producing electricity was subordinated to a basic political strategy to assure a genuinely Argentine technological-industrial development.

On Wednesday, March 20, 1974 at 11 minutes after 12, the Atucha nuclear facility began to deliver electricity to the interconnected Buenos Aires-Litoral system. Thus General Juan Perón, then President of the Republic, had the satisfaction of seeing the efforts begun almost 30 years earlier during his first term in office, realized.

The second plant

On January 6, 1967, at the urging of the Provincial Energy Company of Córdoba (EPEC), a contract was signed authorizing the CNEA to do a feasibility study on the construction of a nuclear plant in that province. A year and a half later, the CNEA delivered a pre-investment study to the government motivating the construction of an 85-150 Mw plant, without making specific recommendations on the most appropriate reactor line. Both the natural water reactors—the

BWR and PWR—and the heavy water variants, PHWR, HWR, BGHWR and the VULCAIN, were considered.

The document rejected the possibility of producing enriched uranium domestically, but noted the policy shift in the United States regarding supply, leaving open this alternative which had appeared definitively closed as a result of studies done for Atucha.

Done in conjunction with the Secretary of Energy and the EPEC, these studies concluded that the Córdoba electrical system should be linked to the Greater Buenos Aires-Litoral system, and that the proposed plant should have a 600 Mw capacity.

In April of 1971, the military Junta decided to build the country's second nuclear plant and ordered CNEA to open bidding without a predetermination as to the type of reactor or the supplier. It should be pointed out that in the bidding, begun in December of that year, the specifications were published in Spanish for the first time.

The bidders were essentially narrowed to General Electric and Westinghouse (for enriched uranium) and Atomic Energy of Canada, Ltd. (AECL), and KWU Siemens for the natural uranium reactor. The Junta's indecision over the choice of a natural uranium line led to a game of intense pressures as reflected in the document issued by the Association of CNEA Professionals arguing that the use of enriched uranium would jeopardize the country's future. Once more, strategic considerations prevailed and the decision was made to build a natural uranium plant.

On December 20, 1973 the CNEA signed a contract for the plant's construction with the AECL consortium (nuclear island) and Italmipianti (conventional island), later approved by Decree 706 of March 7, 1974. Prior to the final decision, the AECL announced publicly that authorities in Ottawa were open to signing a technical agreement with Argentina for development of nuclear reactors. For various reasons, the Canadian government then chose to ignore its responsibility to transfer technology, stressing that Argentina had not offered explicit guarantees not to detonate any nuclear devices.

In March of 1976 the contractors convinced the CNEA that unforeseen circumstances—international and domestic inflation—had fundamentally altered the contractual relationship to the point that if changes weren't made, the project would come to a halt.

At the end of that year, an additional agreement was made changing the original terms of the contract and incorporating the higher costs. In this agreement, the AECL once again agreed to the transfer of technology as in the original contract, but this arrangement remained unfulfilled due to Premier Pierre Trudeau's clear anti-proliferation stand.

This incident led the CNEA to favor the KWU alternative for the construction of the third reactor, since the nuclear relationship with Germany offered the advantage that both countries held similar positions on the issue of non-proliferation.

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