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Special National Intelligence Estimate, SNIE 91-2-82, 'Argentina’s Nuclear Policies in Light of the Falkland’s Defeat'

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Summary:

Argentina, like its neighbor, Brazil, was determined to develop an “independent nuclear fuel cycle,” with the capacity to reprocess plutonium and enrich uranium. Also like Brazil, Argentina was one of the few Latin American countries to refuse to sign the Nuclear Nonproliferation Treaty. Thus, Argentina’s nuclear activities were under routine scrutiny to see if they involved anything that suggested an interest in a weapons capability. US intelligence agencies continued to monitor developments but perspectives shifted as Argentina’s domestic politics evolved. Prepared after the Argentine-British conflict over the Falklands Islands, in which Washington helped London, this special estimate professed “great uncertainty” over Argentina’s nuclear intentions. While “emotionally” the Argentine military leadership was interested in a weapons option, it had “reduced capability to fulfill this desire.”

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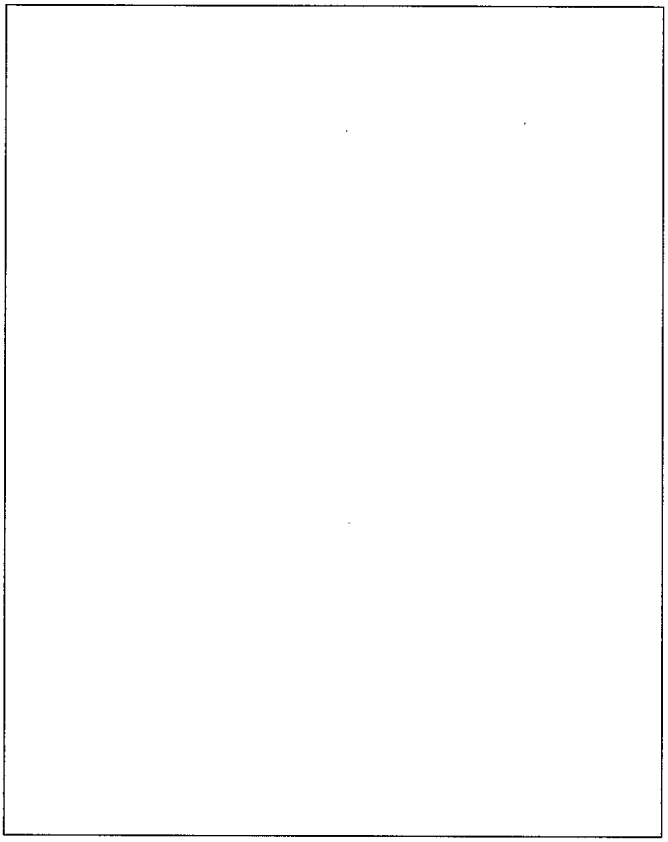

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SNIE 91-2-82

ARGENTINA'S NUCLEAR POLICIES IN LIGHT OF THE FALKLANDS DEFEAT

Information available as of 1 September 1982 was used in the preparation of this Estimate.

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THIS ESTIMATE IS ISSUED BY THE DIRECTOR OF CENTRAL INTELLIGENCE.

THE NATIONAL FOREIGN INTELLIGENCE BOARD CONCURS.

The following intelligence organizations participated in the preparation of the Estimate:

The Central Intelligence Agency, the Defense Intelligence Agency, the National Security Agency, and the intelligence organizations of the Departments of State, Treasury, and Energy.

Also Participating:

The Assistant Chief of Staff for Intelligence, Department of the Army

The Director of Naval Intelligence, Department of the Navy

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SCOPE NOTE

This Estimate examines Argentina's nuclear policies in the aftermath of the Falklands conflict. It reviews Argentine technical capabilities for developing nuclear explosives and presents three scenarios that could lead to Argentine production of plutonium in the 1986-88 period. It also attempts to assess the impact on the Argentine nuclear program of the political disarray and economic distress that have resulted from the Falklands defeat.

KEY JUDGMENTS

Argentina's determination to complete an unsafeguarded nuclear fuel cycle which could serve military as well as civilian purposes has been amply demonstrated in recent years. The momentum to achieve this goal appeared to be intensifying in the months prior to the Falklands conflict. The defeat in the Falklands undeniably has raised fundamental issues of sovereignty, prestige, and security that will preoccupy the Argentine military leaders and any possible successor regime for several years to come

The immediate impact of the Falklands defeat cuts two ways. Emotionally, it has probably increased the desire to develop a nuclear weapons option. Politically and economically, however, it has reduced Argentina's capability to fulfill this desire. Consequently, we have great uncertainty concerning the future course of Argentina's nuclear policy decisionmaking, especially over the coming months and possibly for the next several years.

We judge, nevertheless, that unfavorable economic prospects and political turmoil will not prevent the Argentine Government from achieving the technical capability to make nuclear explosives before the end of this decade. The historic momentum and the sustained progress of the program over a generation despite recurrent crises support this judgment. At the same time, as indicated above, we cannot predict with confidence how effectively Argentine leaders will be able to provide budget support to the nuclear program or the rate at which nuclear goals will be achieved.

In the meantime, Argentina's need for external resources may well provide opportunities to generate pressure on its leadership to keep its nuclear development within peaceful bounds. US efforts, however, to exert such pressure, whether applied directly or through other countries, would be constrained by the frequently demonstrated Argentine resistance to any external attempts to influence its nuclear ambitions.

The strength of Argentina's commitment to its nuclear program has its origins in a decision, taken more than 30 years ago, to develop an indigenous nuclear program:

— Its decision to develop a completely independent fuel cycle first became evident in the mid-1960s when it built its first laboratory-scale reprocessing plant. A reprocessing facility now

under construction is scheduled for full operation in 1986 and could permit separation (from safeguarded fuel) of sufficient plutonium to construct a nuclear explosives device in 1987. A diversion of the plutonium for this purpose, however, would constitute a violation of international safeguards and carry grave consequences for Argentina's commercial nuclear program.

— Argentina is acquiring other facilities and materials that are unsafeguarded and could be used in a nuclear weapons program. A planned research reactor, if eventually built, would give Argentina a plutonium production capability free of safeguards.

There are three ways Argentina could produce plutonium. The most likely approach is for Argentina to produce plutonium by reprocessing spent fuel under safeguards. This would provide Buenos Aires with maximum political and diplomatic benefit from foreign perceptions that it could build nuclear explosives on short notice. Under its bilateral accord, Argentina needs West Germany's permission to reprocess the spent fuel from the German-built Atucha reactor. If the Germans give their approval, Argentina could start to implement this plan in 1986. Bonn, however, would face strong international opposition to its grant of permission, regardless of the assurances Buenos Aires may be willing to provide

Should Germany deny reprocessing, Argentina could move to a second alternative, which would be to acquire plutonium through an unsafeguarded approach. This would require the completion of a planned research reactor and would probably take at least five to six years, once construction of the reactor began.

As a third alternative, Argentina could choose to divert fuel from operating power reactors, either clandestinely or in open violation of safeguards, and thereby acquire a nuclear explosive capability in four to five years. We judge pursuit of this option to be unlikely because of the severe political and economic costs it would entail.

The attainment of a nuclear weapons capability by whatever means will not necessarily require the testing of a nuclear device:

— Such a test would alienate other principal countries in South America, especially Brazil and possibly Venezuela and Peru. Additionally, Argentina would be reluctant to offend the continent generally by challenging the Treaty of Tlatelolco, which aims to keep nuclear weapons out of Latin America.

— Argentina could also be deterred by the prospect that an overt test could easily lead to a nuclear arms race with Brazil

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DISCUSSION

Background

1. Argentina's nuclear spokesmen have generally publicized the nuclear program in terms of scientific achievement and future export potential. These statements characterize the primary goals of Argentina's ambitious nuclear program as peaceful: enhancement of national pride, development of alternative energy sources, and promotion of the country as Latin America's scientific and technological leader and a power in the Third World.

2. Nevertheless, Argentina's leaders from the inception of the program have carefully preserved an option to develop nuclear weapons. Since it was created in 1950, the National Atomic Energy Commission (CNEA) has been under senior military control, and major aspects of its research have been highly classified. The unwillingness of Argentine leaders to participate fully in the global nonproliferation regime reinforces international suspicions regarding their ultimate intentions. Moreover, their determination to exercise maximum control over their indigenous nuclear installations, including those which could support a nuclear weapons program, has become more evident in recent years. Argentina's leaders have steadily refused to adhere to the nuclear Non-Proliferation Treaty (NPT), have not ratified the Treaty of Tlatelolco (Latin American Nuclear-Free Zone),[1] and adhere to the rigid diplomatic position of not allowing international inspection of any nuclear facilities or materials that they have either built themselves or purchased without safeguard controls. Argentina has studiously avoided comprehensive (full scope) safeguards.[2] It has turned to suppliers such as West Germany, Switzerland, Italy, and the Soviet Union, who insist only on safeguards pertaining to specific items of nuclear technology which they have supplied and which are identified in internationally accepted nuclear supplier guidelines.

3. The war in the Falkland Islands adds new and important elements of uncertainty regarding Argentina's long-range nuclear intentions. During the Falklands war, Buenos Aires asserted publicly that its adherence to nonproliferation rules had placed it at a clear disadvantage.[3] In letters to the International Atomic Energy Agency (IAEA) in early May 1982, Buenos Aires argued that it had been forced to confront a nuclear weapons state. The letters also proclaimed that Buenos Aires could not continue to accept a discriminatory situation that denies Argentina the legitimate use of nuclear materials for its national defense. At a subsequent meeting of the IAEA Board of Governors on 6-7 June 1982, the head of the CNEA, Rear Adm. Carlos Castro Madero, announced that Buenos Aires would reserve its right to use nuclear energy for nonproscribed military purposes. There has been some public speculation based on the context of his announcement that he was referring to the possible development by Argentina of nuclear-powered submarines. In a subsequent press interview Castro Madero denied any Argentine intention to build nuclear weapons, but asserted that construction of nuclear submarines is now under serious consideration.

Current Political and Economic Considerations

4. The defeat in the Falklands has left Argentina's political power structure in such disarray that we cannot judge the effectiveness of current efforts to restore political stability or gauge the time it will take for any new government to establish and implement its set of national priorities, including the nuclear program. Among the factors at play will be lingering antagonisms and a wounded sense of national pride which could enhance the capability to develop nuclear weapons. Other factors include various Argentine efforts to circumvent international safeguards.

[1] It is unlikely that the attitude of Buenos Aires toward the NPT will change. It is also highly doubtful that Argentina will ratify the Treaty of Tlatelolco in the foreseeable future.

[2] Full scope safeguards require that all nuclear facilities—even those built indigenously—be subject to international inspection.

[3] Argentine leaders have been willing to provide diplomatic assurances that all present nuclear facilities are exclusively devoted to peaceful ends. They refuse, however, to permit on-site international inspection of indigenous facilities, or to adhere to any international agreement that requires Argentina to accept full-scope safeguards.

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Argentina's Nuclear Facilities

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ongoing purchases of heavy water from China outside of safeguards, and frequent assertions by Buenos Aires's top nuclear officials that Argentina could build nuclear explosives should it decide to do so. The nuclear program has always been aimed at enhancing Argentina's image of national prestige and scientific achievement, but the defeat at the hands of the British places even more pressure on the military to demonstrate Argentina's technical capabilities and, at the policy level, the ability to complete a long esteemed national goal of an independent nuclear fuel cycle.

5. It is probable that some Argentine military leaders believe that if their country had possessed nuclear weapons, the British would have treated Argentina's territorial claims with more respect and would have hesitated to rebuff Buenos Aires during the post-invasion negotiations. They probably also believe that the British would not have been so quick to send so large an expeditionary force against them.

6. For the above reasons, the military are likely to be more anxious to move ahead with the nuclear development program but, irrespective of these desires, any Argentine government will face serious constraints that could affect the pace for achieving a nuclear weapons capability. A high priority is to rebuild the armed forces.

7. Argentina's current economic crisis—especially its hard currency crunch—will probably impose additional budgetary restrictions on the nuclear program and is bound to slow moves toward a nuclear weapons capability. Moreover, any shift to a more state-controlled, populist economic policy would require increased government participation in providing credit and other financial incentives to industry, and wage concessions to a labor force feeling increasingly hard-pressed by inflation. Further budget cuts could impose delays—the magnitude of which cannot be estimated. The nuclear program, however, is at a sufficiently advanced stage that projects under construction probably will not be canceled. In 1981 nuclear planners absorbed a 30-percent cut without having to cancel or postpone construction of major nuclear power facilities.

8. Economic stringencies could be used by advocates of a near-term nuclear explosives capability, especially military hardliners, to justify diverting safeguarded spent reactor fuel (or separated plutonium)—a route to weapons-grade material production that would be relatively fast and cheap, although politically risky. The expense involved in building an unsafeguarded natural uranium heavy water research reactor for plutonium production in addition to completing the pilot scale reprocessing plant now in the final stages of construction—roughly estimated to be $100-200 million—would be modest enough not to deter a decision to develop nuclear explosives. Such an undertaking, however, would take several years

9. We believe that official assurances following the defeat that Castro Madero will remain as nuclear chief constitute fresh evidence of a national determination to keep nuclear development on course. Politically the nature of the government will likely have little impact on whether or not the government chooses to develop a nuclear explosives capability, though it could affect the timing. Both military and civilian successor administrations will probably be highly nationalistic and can be expected to share similar goals in terms of restoring national prestige. Moreover, a civilian government would expect to benefit as much as a military one in domestic terms if it achieved an explosives capability. Although a civilian regime's list of priorities might differ somewhat from the military's, pressure from the Army, coupled with the government's own security and prestige needs, would probably propel the program forward. There are occasional rumors that Castro Madero may resign as head of CNEA for health reasons; this, should it occur, probably would have at least a temporary negative impact. Indeed, his departure would probably cause delays in several aspects of nuclear development, but would not halt its progress.

Alternative Scenarios for a Nuclear Weapons Capability

Fissile Material (Plutonium) Production

10. Argentina's plan to utilize fully its reprocessing capability under its bilateral accord will be contingent on West German approval for the separation of plutonium from the safeguarded spent fuel of the Atucha I reactor. Even though safeguards continue to apply to the fuel according to the IAEA agreement, international concern over Argentina's intentions is bound to make approval difficult. If, however, for commercial or other reasons the West German Government approves reprocessing, Argentina will begin

to separate plutonium from spent nuclear fuel when its pilot reprocessing plant becomes operational in 1986, and could shortly thereafter begin to stockpile plutonium that could easily be used for nuclear explosives. Because this scenario involves no immediate risks or costs to the Argentine nuclear program, we judge it to be the most likely one for the near-term acquisition of a stock of plutonium. Once this stockpile exists, other nations will almost certainly perceive that Argentina has the material available to build nuclear weapons on short notice, and we believe that Buenos Aires would exploit this perception for whatever diplomatic and national prestige benefits it may offer.

11. If West Germany denies reprocessing, Argentina would have other alternatives, should it decide to develop nuclear weapons: a *fuel diversion path*, involving the unauthorized and possibly clandestine reprocessing of safeguarded spent fuel, which could give Argentina a nuclear explosives capability within three to four years; and an *unsafeguarded approach*, which would be contingent upon the completion of a large research reactor. Both scenarios are plausible. The potential risks to Argentina's nuclear power program—both economic and diplomatic—are far less with the unsafeguarded approach than with a diversion of safeguarded spent fuel. We realize, however, that these may not be the key factors in a decision to launch a dedicated nuclear weapons program once Argentina has the ability to separate plutonium.

Scenario I: Diversion of Fuel

12. The quickest path to nuclear weapons development would involve a diversion of safeguarded spent fuel from Argentina's operating Atucha I power reactor. We have no confirmed information that undeclared Atucha fuel elements have been clandestinely irradiated and removed for plutonium production. Nevertheless, an IAEA review of safeguards procedures at Atucha I reveals that the monitoring system is inadequate and that domestically fabricated fuel could be clandestinely irradiated and stored. Atucha fuel is fabricated at a rate of approximately 440 bundles per year. These elements are nominally under safeguards; however, the IAEA does not have the monitoring capability to ascertain how many elements are fabricated. This means that nonirradiated fuel elements could be stockpiled without the knowledge of the IAEA. Moreover, clandestine irradiation of fuel could occur at any time without an accurate audit. Since 1976 the camera surveillance systems employed by IAEA to provide coverage of the spent fuel storage ponds at Atucha have on occasion not functioned properly, often allowing the movement of spent fuel from the reactor to the storage pond to go unrecorded. This means that the fuel could move through the transfer canals between the reactor core and the two spent fuel storage ponds without detection. And after a suitable cooling period, spent fuel could be removed from the ponds for reprocessing.

13. The attainment of a nuclear weapons capability by this diversion route would depend on additional factors. Should a decision be made to divert Atucha fuel, the removal would have to take place surreptitiously between scheduled IAEA inspections. The safe transportation of these fuel elements could be difficult. In addition, the production of sufficient quantities of plutonium would be contingent upon the availability of reprocessing capability. CNEA's reprocessing plant will most likely become operational in 1985 if it is completed on schedule.[a]

14. If Argentina were to decide now to divert fuel for the production of plutonium, irradiation of enough fuel for a nuclear device could occur in approximately one year. If spent fuel is at normal design burn-up, as few as 15 spent fuel elements would be required to produce sufficient plutonium for a crude device. (Many more spent fuel elements would be required to produce high quality "weapons grade" plutonium—approximately 64-75 elements.) After one year of reprocessing operations, Argentina could have separated enough plutonium for a nuclear device and begin testing by the end of 1987. Even if fuel rods have already been diverted, Argentina still would not be able to test a device before 1987 at the earliest. The

[a] Recent reports of renovation and expansion, however, suggest there might be delays. in mid-1981 CNEA signed a contract with an Italian nuclear engineering firm to upgrade the CNEA design and to provide a larger fuel chopping machine for the reprocessing facility. This renovation and expansion could increase its capacity to about 20 metric tons (yielding 50-60 kilograms of plutonium) annually. The Italian firm is also assisting in the design and building of an expansion module to the existing plant which will increase its reprocessing capability an additional 30 metric tons annually and is scheduled for completion in the late 1980s. CNEA reportedly is constructing a facility to convert plutonium to metal—a process which is used, in practical terms, only in the production of explosive devices.

pacing factor will be the completion of the reprocessing plant. Once the plant becomes operational, Argentina will be able to stockpile plutonium.

Scenario II: Unsafeguarded Approach

15. If CNEA simply continues its development of the unsafeguarded nuclear fuel cycle until all components are completed and operational, Argentina could have a nuclear explosives capability by 1989 or 1990. The most time-consuming factor would be the construction and operation of a long-planned natural uranium heavy water reactor. The most recent plans designated this reactor as RA-7. Depending on its capacity, it could take approximately five years to complete construction if the project were started now. About six months of testing would then be needed to ensure successful operation. Then after six months more of full-power operation, the RA-7 could begin discharging irradiated fuel for reprocessing. With the planned expansion of CNEA's reprocessing capacity, it would be able to separate enough plutonium for a nuclear explosives device within a year. During construction of these facilities CNEA would have to perform all necessary high explosive (HE) testing and weapons design work. This estimated time to produce plutonium could be cut by 12-18 months if outside technical assistance were to be acquired for the construction of the RA-7. A site reportedly was selected near the Bariloche Atomic Center. The latest reporting, however, reveals that final preparations to build the RA-7 reactor have been canceled and at least some funds have been diverted from this project to reprocessing. The postponement of this reactor project probably constitutes a prudent decision by nuclear officials to utilize available funds to complete the reprocessing plant instead of funding a project that currently lacks a credible detailed design.

16. The eventual attainment of an unsafeguarded plutonium capability would not jeopardize major aspects of Argentina's nuclear power program. Several nuclear supplier states probably expect US pressure not to sell Argentina additional power reactors once unsafeguarded nuclear facilities in Argentina become operational. However, neither the nuclear Non-Proliferation Treaty nor the London Suppliers Guidelines obligate them to insist on full-scope safeguards. Only Canada seems likely to require full-scope safeguards of the Argentines in return for new nuclear supply commitments. Safeguarded nuclear power projects such as the Swiss-provided heavy water production plant could be completed and operational by 1984. Additionally, the Atucha II power reactor is scheduled for completion by 1987—but will probably take longer.[5] By the time the CNEA developed a completely unsafeguarded nuclear fuel cycle, it would also have a safeguarded nuclear fuel cycle in operation with possibly three operating nuclear power reactors.

Nuclear Explosive Design

17. In addition to producing the necessary fissile material, Argentina will have to develop HE technology and an overall integrated nuclear explosive design. Nuclear explosive design could be performed at almost any secure facility, although the design effort would require technical inputs from nuclear research centers and other specialized facilities like the Armed Forces Institute for Scientific and Technical Research. To date, we know of no high explosive testing of the type that would normally be associated with the development of an implosion device. Argentina has two plants that are capable of producing a wide range of high explosives suited to nuclear-related HE development and testing, but no relevant test facilities have been identified.

Political Costs of Nuclear Weapons Development

18. Any policy decision by Buenos Aires to build nuclear devices or weaponry will have some adverse consequences. It would create a perception—at least among several Western states—that Argentina is a highly unpredictable and potentially dangerous nation. The invasion of the Falklands provoked an embargo by the European Community on all conventional weapons sales to Argentina that is still generally in effect.[6] Additionally, the question of whether to continue to export nuclear technology, even with stringent safeguards, has become a subject of political controversy in Canada, which is building Argentina's second nuclear power reactor. Canada and other major nuclear suppliers such as West Germany and Switzerland can be expected to fulfill the terms of existing nuclear export contracts with Argentina, but

[5] Argentina's own relatively small indigenous heavy water production facility could be completed by 1986 if present technical difficulties are overcome.

[6] The French recently have unilaterally lifted their arms embargo.

future cooperation will probably be more difficult, especially if Argentina acquires the reputation of an international pariah.

19. In terms of potential international political costs the riskiest path Argentina could follow is that of a clandestine diversion of safeguarded plutonium. Discovery of such action would probably result in the immediate cutoff of nuclear exports to Argentina by all major nuclear suppliers with whom it has commercial contracts. These include Canada, West Germany, Switzerland, and the Soviet Union.

20. It is conceivable, however, that the desire for a nuclear explosives capability would outweigh practical considerations. Argentina's leaders could gamble on being able to complete the power program on their own, although this would constitute an enormously difficult undertaking. They could also hope that the detonation of a nuclear device would enhance Argentina's standing sufficiently to make it worth the costs. In discussions with US officials, Argentine nuclear-policy officials have conveyed their perception that India's access to nuclear materials and technology has not been seriously impaired, despite its nuclear test in 1974 and its continuing weapons-related research.

International Consequences

21. Any decision by Argentina to develop nuclear weapons, once publicly known, would reinforce a sense of futility about international efforts to control nuclear proliferation in the Western Hemisphere. The impact would be most dramatic, and probably most severe, if Argentina were to test a nuclear device within the next two to three years, using its reprocessing capability to recover plutonium from safeguarded power reactor fuel.

22. The decline of US influence in Argentina, as a consequence of the Falklands conflict, has probably further weakened the already limited ability of the United States to influence Argentina's nuclear program in any respect. The CNEA has specifically informed one US nuclear engineering company that a government prohibition is now in effect against granting contracts to US firms. Official resentment will probably soften over time, but it is highly questionable that the United States will be in an effective position to retard or influence the chances for a nuclear test later in the decade if Argentina is able to produce plutonium in a new unsafeguarded research reactor.

23. If Argentina builds or is clearly seen as intending to build nuclear devices, especially in the near future, regional security relationships in South America would be upset, and diplomatic and military alliances would be affected in ways that would further isolate Argentina from its neighbors. If Argentina were to develop nuclear explosives, it would almost certainly arouse regional and international suspicions that it had done so for military reasons, especially if Buenos Aires persists in its bellicose approach toward unresolved territorial disputes. Brazil could be prompted to move as quickly as possible to attain a nuclear weapons capability to buttress its own security and sense of national prestige. Chile is not sufficiently advanced to have similar options, Santiago is increasingly concerned about Argentina's growing nuclear capability, and it could revive its nuclear research program. Even current Argentine-Peruvian ties, which are based in part on nuclear cooperation, may erode if Lima were confronted with evidence that Argentina was developing a nuclear weapons capability.

24. The desire not to isolate itself in Latin America and to avoid other international political costs could persuade Buenos Aires not to test a device but probably would not prevent the development of a nuclear explosives capability. Argentina might be particularly susceptible to strong diplomatic pressure from Brazil, and perhaps Venezuela and Peru, to leave a device untested, especially if Argentina believed Brazil might show similar restraint. Although neither Brazil nor Argentina fully adhere to the Treaty of Tlatelolco, both are sensitive to the spirit of the accord to keep nuclear weapons out of Latin America.

25. The emergence of Argentina as a nuclear weapons state would also have a predictable detrimental impact on the global nonproliferation regime. This impact would be less damaging if Argentina chooses to proceed along the unsafeguarded route and does not break its commitments to major suppliers and the International Atomic Energy Agency. The attainment of an explosives capability by any route, nevertheless, would increase proliferation dangers in two fundamental ways: other near-nuclear-weapons states would be less inclined to hold back the development of their

nuclear explosives;[7] and some threshold states might have increased interest in turning to Argentina as a source of sensitive nuclear materials and technology.[8]

[7] Similarly, a prior development of nuclear explosives by Pakistan, for example, would probably influence nuclear decisions in Argentina.

Buenos Aires wants to expand its role as a supplier, especially among the nonaligned nations with nuclear development ambitions and in Latin America, according to nuclear spokesmen. Argentina has given no clear indication of what sort of safeguards and controls it will require on its nuclear exports, which could include spent fuel reprocessing technology by the mid-1990s.

ANNEX

Argentina's Nuclear Power Program

1. Argentina's 32-year-old nuclear development program has sufficient momentum to overcome setbacks that the Falklands are likely to cause. After acquiring equipment for its first research reactor from the United States under the Atoms for Peace Program in 1958 the CNEA designed and built four additional research reactors within 13 years; all of the reactors are under safeguards. When Argentina contracted with West Germany for its first nuclear power reactor in 1968, CNEA had the technical base and infrastructure to participate in its construction, with local industry providing some of the electromechanical equipment, materials, civil engineering, and labor. During this same period CNEA sent large numbers of students to the United States and Europe for training in the nuclear sciences and engineering. When construction of the first power reactor was completed in 1974, CNEA had approximately 600 nuclear scientists and 1,000 professional technicians.

2. The only major setback to Argentina's steady progress in nuclear development occurred during the turbulent administration of Mrs. Peron (1974-76). Major political and policy disruptions during that period persuaded many of CNEA's skilled personnel and leading scientists to leave Argentina. The nuclear program temporarily stagnated, and work in research and development especially suffered

3. Since the return of the military to power in 1976, steady progress in nuclear development has been sustained under the leadership of CNEA head, Rear Adm. Carlos Castro Madero. It quickly became evident that his chief objective was to complete a nuclear fuel cycle with minimal foreign assistance and controls.[1] [redacted]

4. At present, Argentina has one nuclear power reactor in full operation and two under construction (see table 2). The Atucha I reactor, completed in 1974, is a 370-megawatt electric (MWe) power reactor that uses natural uranium as fuel and heavy water as a moderator. The reactor was built by Kraftwerk Union (KWU), a subsidiary of Siemens of West Germany and is under safeguards. This reactor has a unique design employing a pressure vessel and is the only one of its kind that West Germany has built for export. [redacted]

5. Buenos Aires has had ongoing problems with Ottawa, the supplier of its second power reactor, over the issues of full-scope safeguards and project costs; controversies over both issues have contributed to construction delays. The 630-MWe Embalse plant is now in an advanced stage of construction, and CNEA hopes to have it operational by 1983, two years behind the original schedule. This reactor is also natural uranium fueled and heavy water moderated, but Canada's CANDU design utilizes pressure tubes rather than a pressure vessel. [redacted]

6. Negotiations for the supply of a third heavy water power reactor began in late 1978 with West Germany and Canada competing for the contract. There is no doubt that Bonn's less stringent requirement for safeguards was the determining factor in Argentina's decision in 1980 to choose a 685-MWe West German reactor for Atucha II. In addition to Atucha II, the Argentine Government plans to construct three more heavy water power reactors by the year 2000 to help meet anticipated energy needs. [redacted]

7. Argentina probably plans to base its future nuclear power program on the West German version of the heavy water reactor, if the Atucha II design proves successful. [redacted]

8. [redacted]

[1] Due to the abundance of natural uranium reserves in Argentina, CNEA had already decided that power reactors fueled with natural uranium would enable Argentina to develop an independent nuclear energy program. This type of reactor system would also enhance CNEA's ability to build a complete nuclear fuel cycle, no part of which would be subject to foreign controls. [redacted]

Table 2

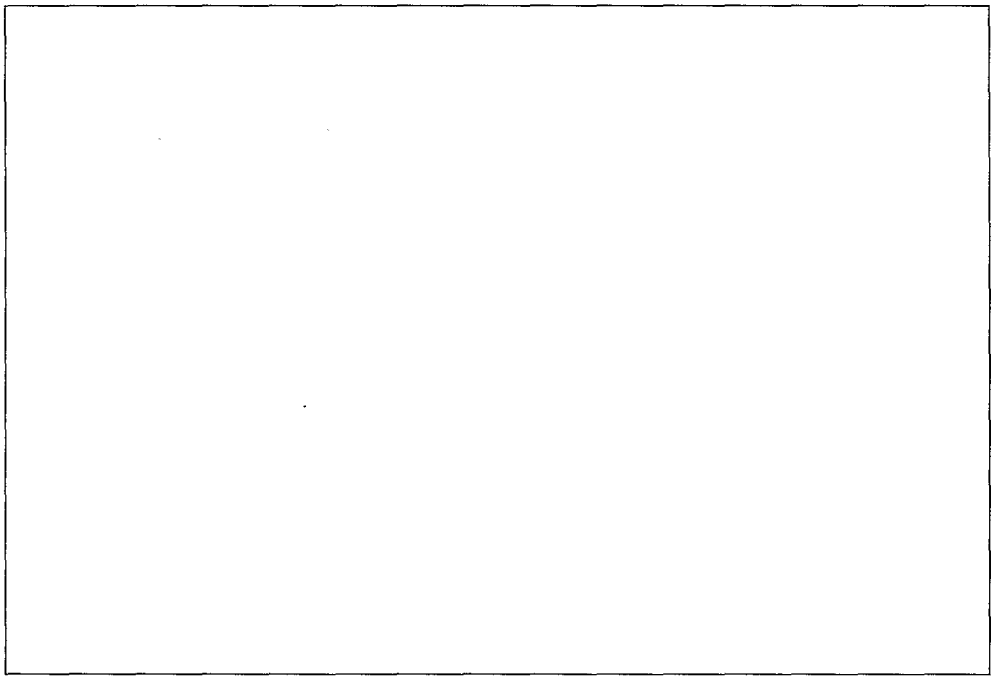
Power Reactors

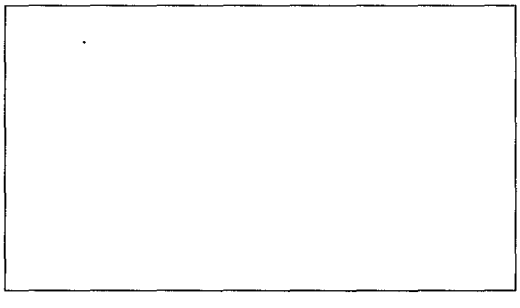
Facility	Actual or Estimated Completion Date	Type	Power (MWe)	Status
Atucha I	1974	PHWR [a]	370	Operational
Embalse	1982-83	CANDU	630	Near completion
Atucha II	1987-?	PHWR	685	Under construction
Power reactor	1991	HWR	600	Authorized
Power reactor	1994-95	HWR	600	Authorized
Power reactor	1997	HWR	600	Authorized

[a] All currently planned power reactors are of the natural uranium heavy water moderated type. PHWR denotes the West German pressurized-vessel heavy water reactor; CANDU denotes Canadian deuterium uranium reactor, a pressure-tube heavy water reactor; and HWR denotes water reactor—version not yet selected.

[redacted]

[redacted]





Argentina's Unsafeguarded Nuclear Fuel Cycle

9. To exploit its plentiful uranium reserves, Argentina has built uranium extraction and refining plants with a combined output of about 200 metric tons of uranium concentrate per year. CNEA is presently building a larger facility which will increase production about 600 to 700 tons annually when it becomes operational in 1984. To convert uranium concentrate to uranium dioxide powder, Argentina operates a conversion plant with an annual output of 50 metric tons.[3]

10. Argentina clearly intends to become self-sufficient in the production of nuclear fuel for both its research and power reactors. The CNEA is building several facilities devoted to the manufacture of fuel rods and the fabrication of natural uranium fuel. The issue of safeguards coverage is quite complicated. Argentina claims that some of these facilities are largely or entirely of indigenous design and will not be placed under safeguards. Nuclear supplier guidelines require exporters to apply safeguards only to certain specific types of nuclear equipment and materials sold. For example, zirconium metal and alloys in tube form—which are used in nuclear fuel rod assemblies—are included on the nuclear suppliers "trigger list" of items that require safeguards, but zirconium

[3] Uranium dioxide production will increase to 200 metric tons this year with the completion of a larger safeguarded facility now under contruction by West Germany.

sponge, the raw material used to make the fuel rods, is not.

11. Argentina now has the capability to make its own fuel assemblies.

In sum, Argentina now has both unsafeguarded and safeguarded zircaloy fuel rods as well as safeguarded and unsafeguarded fuel fabrication plants. These unsafeguarded fuel fabrication facilities could provide fuel for a dedicated plutonium production reactor. Alternatively, availability of such fuel would make it easier for Argentina to divert spent fuel from a safeguarded power reactor possibly without IAEA detection of the safeguards violation.

12. Argentina is determined to master the difficult task of constructing an indigenous heavy water production plant and already has purchased a large stockpile of unsafeguarded heavy water (mainly from China) to meet its near-term needs. Since 1980 a small, unsafeguarded heavy water plant has been under construction at the Atucha complex. It appears to be having technical difficulties. Recently, Siemens of West Germany offered to supply computer control equipment to assist in completing this plant, which will produce 2 tons of heavy water per year. This facility is intended to replace losses of heavy water in the operation of the Atucha I reactor and is scheduled for operation by 1984.

13. Argentina also plans to construct a larger unsafeguarded heavy water production plant using indigenously developed technology

placed under safeguards when it becomes operational.

14. Since 1979 Argentina has been building a reprocessing plant at the Ezeiza Atomic Center. It is nearing completion and is scheduled to become operational by early 1984. However, the completion of radioactive waste and storage facilities and the resolution of the fuel chopping problem will delay actual completion of the reprocessing plant by one to two years. It will be used to reprocess spent fuel from the safeguarded Atucha power reactor. The plant will be designated a national facility not subject to IAEA safeguards, because it has been built entirely by Argentine technicians and is based on a technology developed by CNEA in the early 1960s. The plant is designed to reprocess 6 tons of spent power reactor fuel per year, thereby having the capability for separating approximately 18-20 kilograms of plutonium per year.

15. If Argentina decides to produce nuclear weapons, production of unsafeguarded plutonium could be accomplished by completing this pilot-scale nuclear fuel cycle using the heavy water that Argentina has been stockpiling and the indigenously developed facilities. The only important remaining step would be the construction of an unsafeguarded, natural uranium heavy water research reactor.

16. We believe that if work on this reactor were to begin this year—which now seems doubtful—Argentina could have the capability to develop nuclear weapons outside of international safeguards by 1989. Unanticipated problems in reactor construction could, however, cause further delays.

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