July 31, 1984

Special National Intelligence Estimate, SNIE 91/3-84, 'Argentina’s Nuclear Policies Under Alfonsin'

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Summary:

Almost two years after the 1982 SNIE, the military rule had collapsed and a democratically-elected government led by Raul Alfonsin was taking an unambiguous stand on nuclear weapons. In its 1984 assessment, the intelligence community was more certain about Argentina’s nuclear policies: “on the basis of discernible evidence … Argentina does not have a program to develop or test nuclear explosives.” Nevertheless, Alfonsin was unlikely to change “Argentina’s long-term efforts to achieve its goal of acquiring a full range of nuclear-fuel-cycle facilities.”

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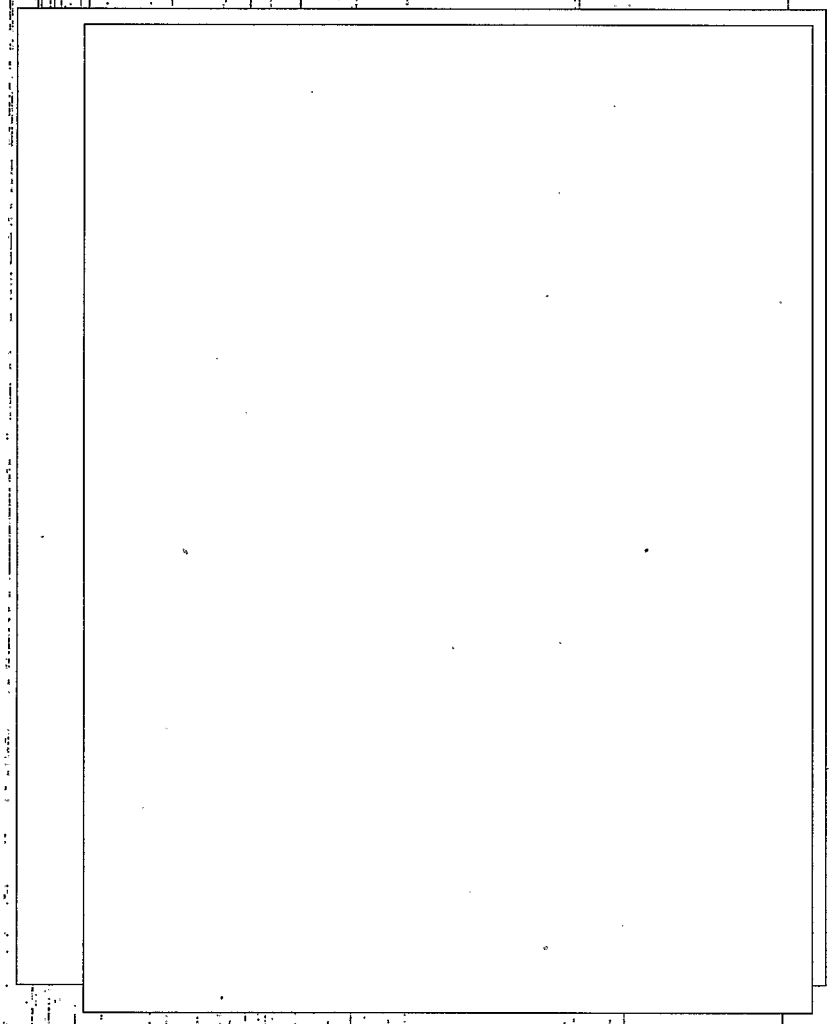

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SNIE 91/5-84

ARGENTINA'S NUCLEAR POLICIES UNDER ALFONSIN

Information available as of 26 July 1984 was used in the preparation of this Estimate, approved by the National Foreign Intelligence Board on 27 July 1984.

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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 and Energy.

Also Participating:

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

The Director of Naval Intelligence, Department of the Navy

The Assistant Chief of Staff, Intelligence, Department of the Air Force

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SCOPE NOTE

The purpose of this Estimate is twofold: to assess Argentina's claim to a uranium enrichment capability and the implications of such a capability, and to examine the scope and likely impact on Argentina's nuclear program of President Alfonsin's publicly proclaimed policy objectives. This Estimate complements SNIE 91-2-82, *Argentina's Nuclear Policies in Light of the Falklands Defeat*, dated 8 September 1982, which reviewed Argentine technical capabilities and presented various scenarios for the production of plutonium in the 1986-88 period. The scope of this Estimate insofar as it pertains to technical capabilities continues to be 1986-88. Political projections, however, should be regarded as more tentative and do not extend beyond one year.

KEY JUDGMENTS

President Alfonsin has initiated steps to place Argentina's nuclear program under civilian control and to limit military involvement within Argentina's Nuclear Energy Commission (CNEA). The Argentine Government, after more than seven months in office, however, has yet to implement a clear nuclear policy or to take many specific steps to alter the scope or direction of the national nuclear program. We believe, on the basis of available evidence, that Argentina does not have a program to develop or test nuclear explosives. We also believe that Alfonsin is likely to prevent the formal initiation of such a program during his tenure.

We believe Argentine statements to US officials, however, that work will continue on technologies needed to close the nuclear fuel cycle; Argentina will have the capability to separate plutonium from safeguarded fuel when its nuclear reprocessing plant is completed in 1986 or 1987. Furthermore, the military is likely to continue its involvement in some of the most sensitive nuclear programs, including uranium enrichment and reprocessing.

Proposed cuts in the nuclear budget—possibly as much as 30 percent—are inevitable, due largely to the government's current financial difficulties, and are likely to slow completion of some nuclear projects. expensive, safeguarded facilities are the ones most likely to be affected.

We doubt that any restrictions Alfonsin might place on the CNEA would undermine Argentina's long-term efforts to achieve its goal of acquiring a full range of nuclear-fuel-cycle facilities, with no externally imposed restrictions on what it considers to be Argentine technology. The persistent progress of the program for more than 30 years supports this judgment. Moreover, Alfonsin supports these overall objectives, and his maneuvering room on nuclear reform—and on other issues that have broad nationalistic appeal—is circumscribed by his tenuous political base, the fragility of Argentine democratic institutions, and the pressing nature of other crises confronting his administration. Our assessment is that Alfonsin will avoid making substantial changes in nuclear policy because of the political controversy such a move would ignite. His personal popularity will be severely tested on other, more pressing issues.

We believe that Argentina has successfully tested uranium enrichment technology as it claims. It is unlikely, however, that the uranium

enrichment facility now under construction will be completed by the announced target date of 1985, or that it will produce significant quantities of enriched uranium before the late 1980s at the earliest.

Nevertheless, we believe that construction of this facility will continue. Since the installation of the new government, senior officials have publicly indicated that uranium enrichment will continue to be funded and have been noncommital to foreign requests that it be placed under international safeguards. We believe that Alfonsin will not open the new enrichment facility at Pilcaniyeu to safeguards inspections by the International Atomic Energy Agency (IAEA).

The announced objective of an annual production capability of 500 kilograms of uranium enriched to 20 percent, if achieved, would give Argentina the option to produce weapons-grade material. Once the facility becomes operational, it could take as little as a year and a half to two years to produce sufficient highly enriched uranium for a nuclear device if Pilcaniyeu were the only source of enrichment, and six months or less if either 20-percent- or 3-percent-enriched uranium were obtained from foreign sources. An important constraint on the timing is the difficulty Buenos Aires is likely to encounter in seeking to import the specialized equipment needed to complete its plant

We believe that any effort by Alfonsin to accede to international nonproliferation pressures would be effectively blocked by domestic criticism that he would be sacrificing Argentina's nuclear independence. Despite early encouraging signals on ratification of the Treaty of Tlatelolco, both Alfonsin and Foreign Minister Caputo are now reported as saying that Argentina will not ratify the treaty in the near future. We believe the acceptance of comprehensive safeguards is also unlikely.

We believe that Argentina's development of its own uranium enrichment technology has strengthened the commitment to nuclear development in Brazil, which has privately begun to accelerate its indigenous nuclear program. Since November 1983 it has proceeded with construction of a pilot centrifuge uranium enrichment plant, increased funding for all indigenous research activities at the expense of the nuclear power program, and tightened security measures at its nuclear research centers. We believe these activities are evidence of a new level of concern prompted by growing distrust of longer term Argentine intentions and capabilities to develop nuclear explosives.

We believe that differences with Washington over nuclear policy issues will continue to cause problems for bilateral relations. Even

though the Alfonsin administration would probably welcome an improvement in bilateral relations, we deem it unlikely that Argentina will make the necessary concessions required for the resumption of nuclear cooperation with Washington, given US legal and policy requirements. The completion and operation of unsafeguarded fuel-cycle facilities would have additional negative impact on bilateral relations and could inhibit cooperation on a wider range of issues. Furthermore, Buenos Aires's firm resistance to comprehensive safeguards and international treaties that serve nonproliferation objectives casts some doubt on Argentina's commitment to keep its nuclear assistance to other developing nations within the accepted rules of nuclear commerce.

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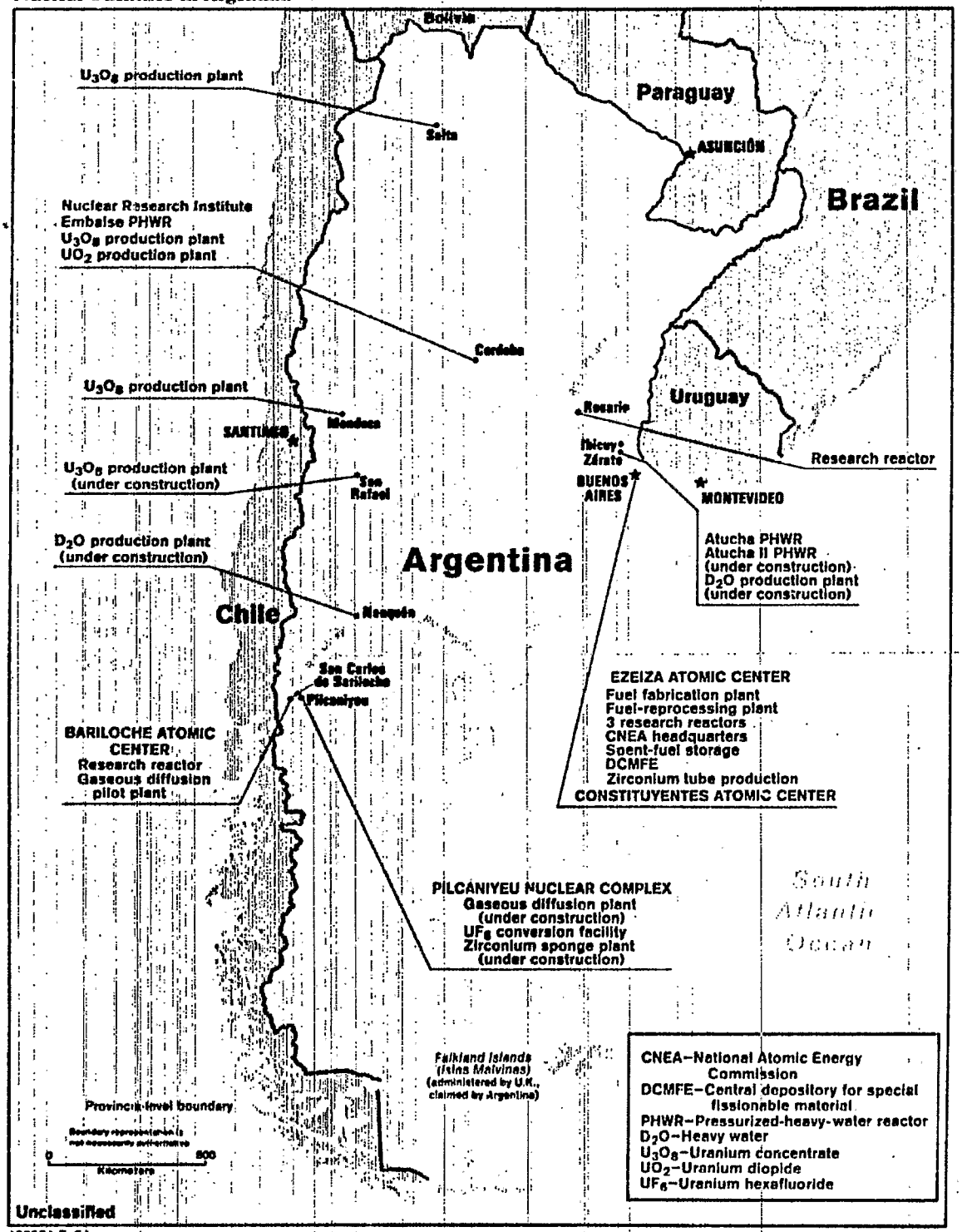
Nuclear Facilities in Argentina



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DISCUSSION

1. In mid-November 1983, a few weeks before Argentina's return to civilian rule, the outgoing head of the National Atomic Energy Commission (CNEA), retired Vice Admiral Carlos Castro Madero, claimed that his scientists had developed the capability to enrich uranium using the gaseous diffusion method. This public announcement served important political objectives: it reinforced nationalistic pride in the highly successful nuclear development program by demonstrating an indigenous capability to enrich uranium; by overcoming US cutoff of enriched uranium; by countering criticism by President-elect Alfonsin of nuclear policies; and by reminding the world that Argentina is moving toward command of its own nuclear fuel cycle.

2. Argentina's attainment of its own uranium enrichment capability is fresh proof of a determination to develop a full range of nuclear facilities outside international safeguards. The announcement of an enrichment capability reinforces international concern already sparked by the construction of a spent-fuel reprocessing plant—which will not be safeguarded—that within a few more years Argentina will be able to produce the fissile material necessary for nuclear weapons.[1] The return of Argentina to civilian rule under President Raul Alfonsin, however, is beginning to subject the nuclear program to more critical scrutiny by other government elements, including the Foreign Ministry and the Treasury, than at any time in its 30-year history. Alfonsin's opposition to the development of nuclear weapons and his desire to consolidate the power of the elected, constitutional government has resulted in a number of personnel changes designed to establish civilian control over the nuclear program. These and other recent developments raise important questions about the nature and future direction of Argentina's nuclear program.

[1] Argentina does not have a source of unsafeguarded plutonium in quantities significant for nuclear weapons. Should it decide, however, to abrogate safeguards or to divert and reprocess safeguarded spent fuel, Argentina's reprocessing plant will have the capacity to produce enough plutonium for weapons use. For a discussion of Argentina's technical capabilities to produce plutonium, see SNIE 91-2-82, *Argentina's Nuclear Policies in Light of the Falklands Defeat* 8 September 1982.

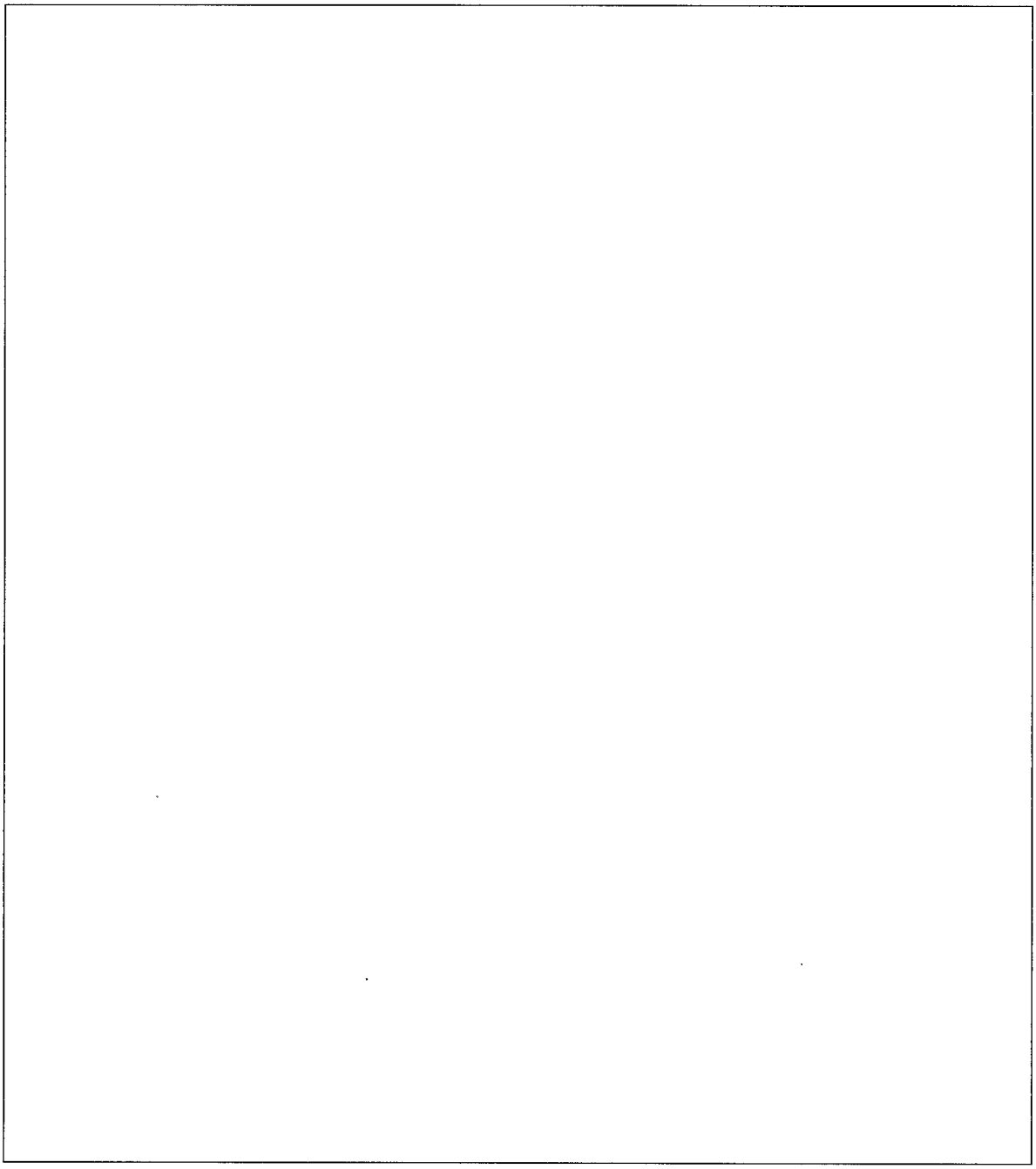
Uranium Enrichment

Technical Assessment

3. Although the Argentines have developed the technology to enrich uranium, we lack confirmation that their indigenous equipment has functioned successfully.[2]

4. Other countries that have developed their own gaseous diffusion systems have experienced serious difficulties which they have overcome only at the cost of time, effort, and great expense. In addition, Argentina currently lacks the facilities necessary to produce uranium hexafluoride (the feed material for the gaseous diffusion process) in sufficient quantity for large-scale uranium enrichment; however, this capability is not technically difficult to achieve. An important constraint on Buenos Aires is the difficulty it will probably encounter in seeking to import the specialized equipment needed for completion of its plant, such as compressors and vacuum pumps.

5. We therefore consider it unlikely that Argentina will complete the uranium enrichment facility by the



specified target date of 1995 or that it will be able to produce kilogram quantities of 20-percent-enriched uranium before the late 1980s at the earliest.

Production Capability

6. We believe that achievement of the production capability of 500 kilograms per year of uranium enriched to 20 percent—an announced goal of the Argentines—would significantly improve their ability to produce nuclear explosives, should that decision be made and if the uranium enrichment facility remains unsafeguarded. Although the stated purpose of the facility is to provide fuel for Argentina's research and power reactors and export purposes, we have reservations about the stated end-uses. Granted that the possession of an enrichment capability gives Argentina credibility as a supplier of research reactors for the export market, the approach lacks economic viability (by US standards) and ignores the availability of alternative sources of safeguarded enriched uranium from the Soviet Union and China.

7. Should the Argentines decide to produce highly enriched uranium (HEU), the time required after commencement of operations to produce enough HEU for a nuclear device could range from two years down to about six months, depending on whether preenriched uranium could be obtained in sufficient quantities from outside Argentina.[3] As a general rule, once uranium enrichment technology has been mastered and some experience has been obtained, a political decision is the controlling factor in any nation's decision to produce weapons-usable enriched uranium.

Alfonsin's Nuclear Policies

Safeguards on Enrichment

8. US officials have been told by the Argentine Foreign Minister that President Alfonsin intends not to curtail the enrichment program or place it under international safeguards. Although clearly surprised and apparently somewhat irritated by what he publicly described as being "confronted" with this nuclear capability following his election, his subsequent statements have been limited to assurances that the program will be used only for peaceful purposes.

9. We believe that Alfonsin will not open the new enrichment facility at Pilcaniyeu to safeguards inspections by the International Atomic Energy Agency (IAEA). The acceptance of international safeguards at this facility—which Argentine officials clearly regard as indigenous—would constitute a radical break with what has been a consistent national policy of opposing all foreign efforts to impose restrictions on Argentina's own nuclear facilities and technology. Alfonsin has been noncommittal in his responses to suggestions by both the IAEA and the United States that the program be safeguarded.

10. Alfonsin's public statements regarding safeguards policy have been quite general in scope, and we believe he will probably leave the defense of the uranium enrichment program to nuclear officials. They have already rejected IAEA safeguards because this would compromise important technical secrets, a position that has often been advanced by South Africa, Japan, and West European countries to protect their own versions of uranium enrichment technology. They might also argue that:

- None of the world's gaseous diffusion enrichment plants are now subject to international inspection.
- IAEA safeguards for uranium enrichment through a gaseous diffusion process are still in the developmental stage.

Civilian Control

11. Despite the resistance to placing enrichment facilities under international safeguards, we believe that President Alfonsin would like to impose tighter national controls over Argentina's nuclear program and prevent the development of nuclear weapons. During his campaign, he frequently renounced nuclear weapons. Shortly before his inauguration in December 1983, he created a special three-member commission headed by Foreign Minister Dante Caputo to draft legislation designed to reorganize the CNEA and remove it from military controls.[4] According to Argen-

[4] This is clearly a "blue-ribbon" commission. The other two members are German Lopez, who as a top Alfonsin adviser holds the title Secretary General of the Presidency, and Jorge Sabato, a high Foreign Ministry official and a member of one of Argentina's most distinguished intellectual families.

tine officials, this commission will present its draft proposals to Congress in August 1984. Caputo has told US Embassy officials that he plans to be the only spokesman for nuclear policy and that the Argentine Congress will exercise special oversight functions, although neither has yet been demonstrated to be the case.

12. The appointment of civilian Alberto Constantini as President of CNEA is an indication of Alfonsin's desire to reduce military influence within the nuclear program. Constantini, however, has come to favor continuation of the national program along much the same lines as his predecessor, retired Vice Admiral Castro Madero. Nevertheless, because Constantini is a close friend of Alfonsin, his appointment does provide the President with at least a potential means to control CNEA. Castro Madero has continued to exert influence on nuclear policies through aggressive lobbying activities and as an honorary adviser to CNEA. He reportedly now intends to take a high-level position with the International Atomic Energy Agency in Vienna.

13. Because of these developments we do not foresee the initiation of a formal program to develop or test nuclear explosives. We believe that Alfonsin is sincere in his intent to prevent the development and testing of nuclear explosives, and that he would stop any weapons-related work should he discover it. He has appointed men of high caliber to design the mechanisms of civilian control. Formulation and implementation of these policies, however, could prove difficult because of the sheer size and complexity of the nuclear establishment and its strong domestic lobby.

Sensitive Research Continues

14. We consider it unlikely that a nuclear weapons program per se could remain hidden from Alfonsin, but some sensitive research could be shielded from scrutiny. Foreign procurement efforts continue at a strong pace, particularly in the search for reprocessing assistance and unsafeguarded supplies of heavy water and uranium hexafluoride

15. In a February 1984 press interview, the Argentine Foreign Minister gave new emphasis to the necessity of maintaining the nuclear program at a high technological level. Argentina has already achieved a sufficiently high level of technical capability in the nuclear field to make future achievements likely—achievements that would enhance the prestige of any Argentine government.

despite the current budget battle, the spent-fuel reprocessing and uranium-enrichment programs will receive sufficient funds to continue. The spent-fuel reprocessing plant is now scheduled for startup in 1986.[5]

16. Alfonsin and his advisers may not be fully aware of the scope of CNEA's activities, or of the precise nature of its relationship with ancillary organizations such as Techint and INVAP, which have major nuclear engineering responsibilities for the development of reprocessing and uranium-enrichment technology, respectively. Furthermore, some sensitive aspects of the nuclear program apparently remain under the control of the military, such as the uranium-enrichment facility at Pilcaniyeu. Since these organizations in particular have not been singled out for criticism, it is possible that some research and development activities now assigned to CNEA could be shifted to these semiautonomous entities and that their role in nuclear development will expand.

the involvement of both organizations in nuclear and high-technology research is continuing to grow. Moreover, they have independent authority to import nuclear equipment and materials.

The Nuclear Debate

17. The election of a civilian government and the uranium enrichment announcement have engendered an unprecedented ongoing public debate over the overall direction of the nuclear program. A few politicians and newspapers have criticized the nuclear program, arguing that CNEA has received a disproportionate share of budgetary resources for years, thereby contributing to Argentina's economic difficulties. In addition, secrecy surrounding nuclear development generally, and uranium enrichment specifically, reinforced domestic and international concerns about Argentina's nuclear capabilities and goals. There is a large body of domestic opinion, however, cutting

[5] A key judgment of SNIE 91-2-82, *Argentina's Nuclear Policies in Light of the Falklands Defeat*, is that this reprocessing facility may reach full operation in 1986 and could permit separation (from safeguarded fuel) of sufficient plutonium to construct a nuclear device in 1987.

across military/civilian/party lines, for which nuclear accomplishments and independence are a source of great national pride. In early February 1984, nuclear advocates made public appeals to prevent Alfonsin from cutting the nuclear budget, splitting CNEA, and acceding to international nonproliferation agreements. They demanded the government guarantee that the nuclear plan continue, remain independent, and receive necessary funding. In a separate formal declaration, several Peronist congressmen warned that Alfonsin could become the first Argentine President to abdicate nuclear autonomy in response to external pressures

18. Alfonsin reportedly has not focused on the nuclear issue, nor has he made any fundamental decisions regarding it. So far, proposed reforms have been restricted to reorganization, some projected budgetary cutbacks, and statements against nuclear weapons. Alfonsin has probably decided to conserve political capital for more immediate issues, such as the foreign debt and labor reform.

Nuclear Reorganization

19. Alfonsin has taken some initial steps to establish civilian control over the nuclear program. For example, he has removed it from the Navy's supervision and directed the Treasury to oversee the nuclear budget. all military personnel except those who have technical expertise and are currently performing technical work or who are employees of long standing are being removed from CNEA. This action reportedly is viewed by the new government as a critical step in ensuring civilian control over the nuclear program. all key civilian personnel will be retained, although there is likely to be some reshuffling of positions. Moreover, the intent of legislative proposals recently drafted by the Caputo commission reportedly is to assure civilian control over the nuclear program. The specific recommendations are to:

- Create a legal requirement that Argentina's nuclear activities be directed only toward peaceful uses.
- Establish a broad of directors, appointed by the President, to oversee the actions of the nuclear agencies.
- Transfer nuclear regulatory functions (including plant licensing and safety inspections) from CNEA to a newly created regulatory commission that will report to the new board of directors

20. Public statements made before Alfonsin's inauguration that the energy portion of CNEA's activities would be reassigned to the secretary of energy or that the nuclear power program would be significantly downgraded in importance have not been substantiated. We consider it unlikely that such a major breakup of the CNEA will ensue. Moreover, the splintering off of power facilities would involve a major restructuring of the entire nuclear program that would invoke strong criticism from nuclear advocates

The Nuclear Budget

21. President Alfonsin clearly intends to bring the budgets of various agencies, including the CNEA, under more critical and centralized review, which would enable him to improve the regulation and oversight of government expenditures. Because of the confused economic and financial situation which the new government inherited, it has so far been unable to formulate a 1984 budget. Nonetheless, some cuts in the nuclear program are inevitable, given Argentina's current severe financial difficulties and Alfonsin's commitment to increased expenditure on social and economic reforms.

22. In assessing the scope of Alfonsin's plans for nuclear reform, we believe that he is particularly sensitive and vulnerable to criticism that he is willing to sacrifice the autonomy of Argentina's nuclear program to improve relations with the United States and possibly other members of the nonproliferation regime. Alfonsin is a pragmatic politician who realizes that he must maintain his current popularity if he is to be an effective President. He already risks the loss of some nationalistic support in his efforts to resolve the Beagle Channel territorial dispute with Chile and to reduce tensions over the Falklands. We believe that the main problem he faces in dealing with the CNEA, and the military's involvement in the nuclear program, is compounded by the fact that nuclear development is one of the few areas in which Argentina has had demonstrable successes in recent years—successes that previous governments turned into patriotic triumphs

23. Our assessment that Alfonsin will not make substantial changes in Argentine nuclear policies is

based on his his need to expend his political capital and his personal popularity on other, more pressing, political battles. Faced with divisive partisan politics, and staggering economic and social problems, Alfonsin seems unconvinced of the need to enter the fight to substantially alter the scope and direction of the nuclear program. Consequently, his plans for nuclear reform at this juncture should be considered as largely unformulated and fragile.

Likely Approach to Safeguards and Nonproliferation Issues

24. We do not expect major changes in Argentine positions on international safeguards or a willingness to adhere to the nuclear nonproliferation regime.[6] Traditional rejection of the Nuclear Non-Proliferation Treaty (NPT) has been maintained, and, despite encouraging early signals on the Treaty of Tlatelolco, Alfonsin has now said that there will be no ratification in the near future. Indeed, senior Energy and Foreign Ministry officials are giving new emphasis to longstanding Argentine objections that the Treaty discriminates against non-nuclear-weapon states and is ineffective at present.

set three conditions for Argentine adherence to Tlatelolco:

— A safeguards agreement with the IAEA that preserves the option to develop peaceful nuclear explosives.

— Concrete assurances by the United Kingdom that it will observe its obligations under Protocol II of Tlatelolco—that is, not permit its nuclear weapons, including nuclear-powered ships, to enter the territorial waters of Latin America.

— Joint efforts by Brazil, Argentina, and Chile to bring the treaty into effect simultaneously.

25. We believe that Argentina's frequently demonstrated resistance to all external attempts to influence its nuclear ambitions will continue to constrain US and other international efforts to bring it into conformance with major nonproliferation objectives such as acceptance of comprehensive safeguards or adherence to the Nuclear Non-Proliferation Treaty. Alfonsin's administration has already joined international efforts—the recent four-continent "peace initiative" under Indian leadership—to condemn the United States and the USSR for the breakdown in arms control talks and to bring pressure on all nuclear-weapon states to make progress toward disarmament as stipulated in Article VI of the NPT.

26. We believe that Alfonsin's proposal in January 1984 for a regional South American safeguards inspection system was designed in part to foster a spirit of regional nuclear cooperation. We further believe that it was intended to be a demonstration of Argentina's intention to keep its nuclear program within peaceful bounds. The Brazilians reportedly rejected the idea, and it appears to have gone no further.

Importance of Nuclear Exports

27. Debt problems throughout South America are likely to impede major transfers of nuclear equipment for at least several years, but Argentina continues to negotiate nuclear cooperation agreements with its neighbors. nuclear assistance to Peru was halted temporarily for lack of funds. In contrast, however, nuclear cooperation in nonsensitive areas appears to be expanding with Brazil, and Argentina recently reached a similar agreement with Chile

28. We consider it likely that Alfonsin's opposition to military applications of nuclear development and his desire to improve bilateral nuclear relations with the United States will have some influence on Argentina's nuclear cooperation relations with other countries of proliferation concern.

At the same time, however, Argentina will continue to be courted as an attractive nuclear partner by other Third World countries, such as Pakistan, Turkey, and Algeria, because of its advances in nuclear technology.

The expansion of Argentina's nuclear exports into such

sensitive areas of technology will raise new export control questions for the nonproliferation regime.

Regional Implications

29. We believe that Argentina's development of its own uranium enrichment technology has strengthened the commitment to nuclear development in Brazil and possibly Chile. While public reaction in South America to Argentina's announcement of its pilot enrichment capability has been passive and mostly favorable, Brazilian officials privately are concerned

There have also been public claims by Brazil's highest ranking military officers of the existence of an indigenous nuclear program that could provide Brazil with the capability to produce nuclear weapons by the end of the decade, should a decision be made to do so. We believe these activities indicate a new level of concern prompted by growing distrust of longer term Argentine intentions and capabilities to develop nuclear explosives

30. Chile, which signed a limited nuclear cooperation agreement with Argentina in September, did not publicly react adversely to Buenos Aires's announcement.

however, that Santiago wants to revitalize its nuclear research program and is interested primarily in the acquisition of nuclear-fuel-cycle technology, including a heavy-water plant without international commitments

31. Aside from Brazil and Chile, most Latin American countries are likely to continue viewing the new Argentine capabilities positively. Peru has been implementing a nuclear cooperation agreement with Argentina: the Peruvians may, when it becomes available, purchase enriched uranium from Buenos Aires for their research reactors instead of from the United States—their current supplier.

Implications for the United States

32. We believe that, in general, the Alfonsin administration would welcome an improvement in bilateral nuclear relations with the United States. Alfonsin's efforts to demilitarize the CNEA and his opposition to a nuclear weapons program clearly serve US and global nonproliferation interests.

33. We deem it unlikely, however, that Argentina will make the necessary concessions required for the resumption of nuclear cooperation with Washington given US legal and policy requirements. The existence of unsafeguarded uranium enrichment facilities in addition to a reprocessing plant in Argentina, both of which involved foreign procurement activities, reinforces international suspicions concerning Argentina's long-term nuclear intentions. The completion and operation of unsafeguarded fuel cycle facilities would have a negative impact on bilateral relations and could inhibit cooperation on a wider range of issues. Whatever the outcome, Argentine resistance to US pressure on nonproliferation issues is not likely to abate. In a press interview in February 1984, Foreign Minister Caputo criticized the United States for making demands without offering anything in return. While he indicated that Buenos Aires might be responsive to a gesture from Washington that would permit the review of bilateral problems, he also emphasized that Argentina cannot accept US pressure to ratify the Treaty of Tlatelolco or to place its entire nuclear program facilities under IAEA safeguards.

ANNEX A

Argentina's Uranium Enrichment Program

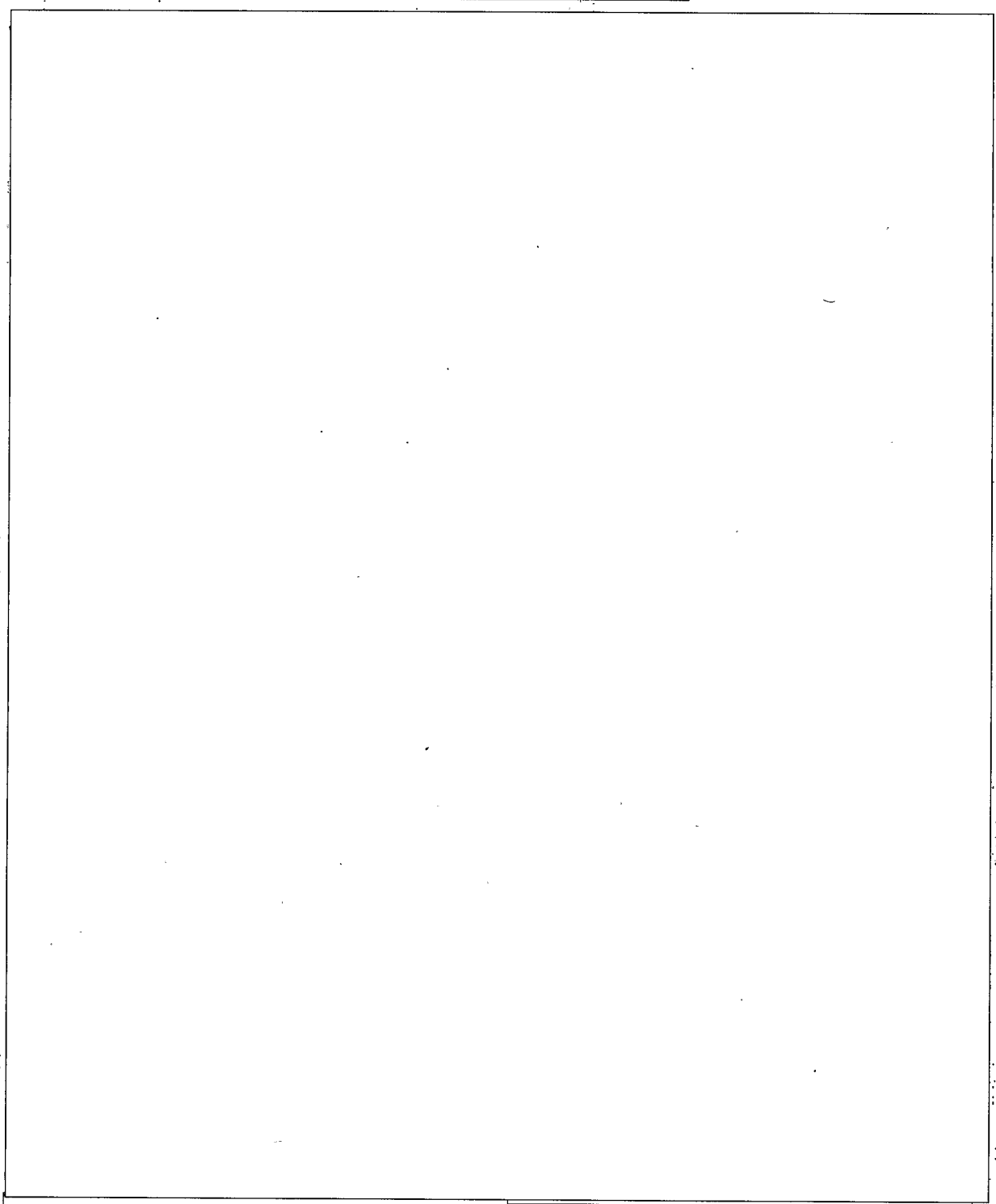
Summary

1. Argentina's claim to have achieved a "proof of principle" of uranium enrichment by the gaseous diffusion process is probably correct. The pilot plant at Pilcaniyeu is still in a relatively early stage of construction, but appears to be large enough to support the capacity projected by the Argentines (equivalent to 15,000 to 20,000 kilogram separative work units, or kg SWUs). Although the Argentines claim that the plant is intended to produce uranium with no higher than a 20-percent enrichment in U-235, there are several ways to operate such a plant that could result in more highly enriched product (80 percent or more) suitable for use in weapons. Their schedule for completion of the pilot plant is very optimistic.

Discussion

2. Retired Vice Admiral Carlos Castro Madero, then President of Argentina's National Atomic Energy Commission (CNEA), announced on 18 November 1983 that "Argentina had obtained the technological capability of enriching uranium by the gaseous diffusion method." According to Madero, testing of the process had been carried out in pilot scale, followed by the design and construction of a medium-size uranium enrichment plant located near Pilcaniyeu. Madero stated that the plant is scheduled to be completed in 1985 and would be capable of producing 500 kilograms per year of uranium enriched to 20 percent. The decision to undertake the project, according to Madero, was made in 1978 after Argentina's supply of enriched uranium was interrupted by the United States.

3. We believe, that the Argentines have achieved at least a proof of principle of uranium enrichment via gaseous diffusion.



8. According to Castro Madero's public announcement, the complete plant is projected to produce 500

kg of uranium enriched to 20 percent by the end of 1985 for use as fuel for Argentina's research reactors and the research reactor now under construction by CNEA in Peru. That amount is more than sufficient to fuel all of Argentina's research reactors as well as any research reactors it may export in the near future. Assuming a fuel requirement of about 0.5 kg U-235 per MWt, then with feed at 0.711 percent and waste at 0.5 percent, only some 5,000 kg SWU/yr would be needed to produce the 120 kg of uranium at 20 percent required to feed research reactors of a cumulative power of 50 MWt, which is Latin America's current capacity. Enriched fuel for research reactors also is available at much less cost from known suppliers. In addition, production of 15 tons of 1-percent-enriched uranium is planned for 1986, to be expanded to 20 tons in 1988. Assuming Argentina's power reactors achieve a capacity of some 1,600 MWe in that the feed requirement at 1 percent enrichment is about 0.5 kg U-235 per MWe, or some 20 kg SWU per MWe, with feed at 0.711 percent and waste at 0.2 percent, then some 32,000 kg SWU/yr would be required. The projected annual production of 20,000 kg of 1-percent-enriched uranium in 1988 equates to a gaseous diffusion plant of some 8,000 kg SWU/yr. However, if Argentina's power capacity increases to 1,600 MWe and 1-percent-enriched uranium is used, then some 85,000 kg of 1-percent uranium would be required or about 32,000 kg SWU/yr. These capacities could be reduced by a factor of about 2.5 should the waste be set at 0.5 percent instead of 0.2 percent in enriching natural uranium to 1 percent. CNEA has described plans to fuel its natural uranium power reactors with this slightly enriched (1 percent) uranium to increase fuel burnup and conserve natural uranium fuel requirements. Although, technically, such increased burnup is possible, we believe the economic penalty for Argentina outweighs the conservation of uranium, supplies of which are available from within Argentina. It should be noted that since it would take some 400 or 500 stages to produce 1-percent-enriched uranium and some three or four times that number to produce 20-percent-enriched uranium, and since the relative capacities of the 1-percent enrichment and 20-percent enrichment setups with the above stage numbers would correspond roughly to 15 tons/yr of 1-percent and 500 kg/yr of 20-percent uranium, respectively, there is some inconsistency in Castro Madero's public announcements of the production schedule. A projection of 15 tons/yr of 1-percent uranium by 1986 and 500 kg/yr of 20-percent uranium by 1988/90 would seem more feasible.

Conclusions

12. The Argentines almost certainly will not be able to complete the uranium enrichment facility, much less produce significant amounts of enriched uranium by 1985. We expect them to have problems in two main areas: high costs and technical complications. In terms of the costs, a capital investment several times that already made will be required. Given the new civilian government's stated

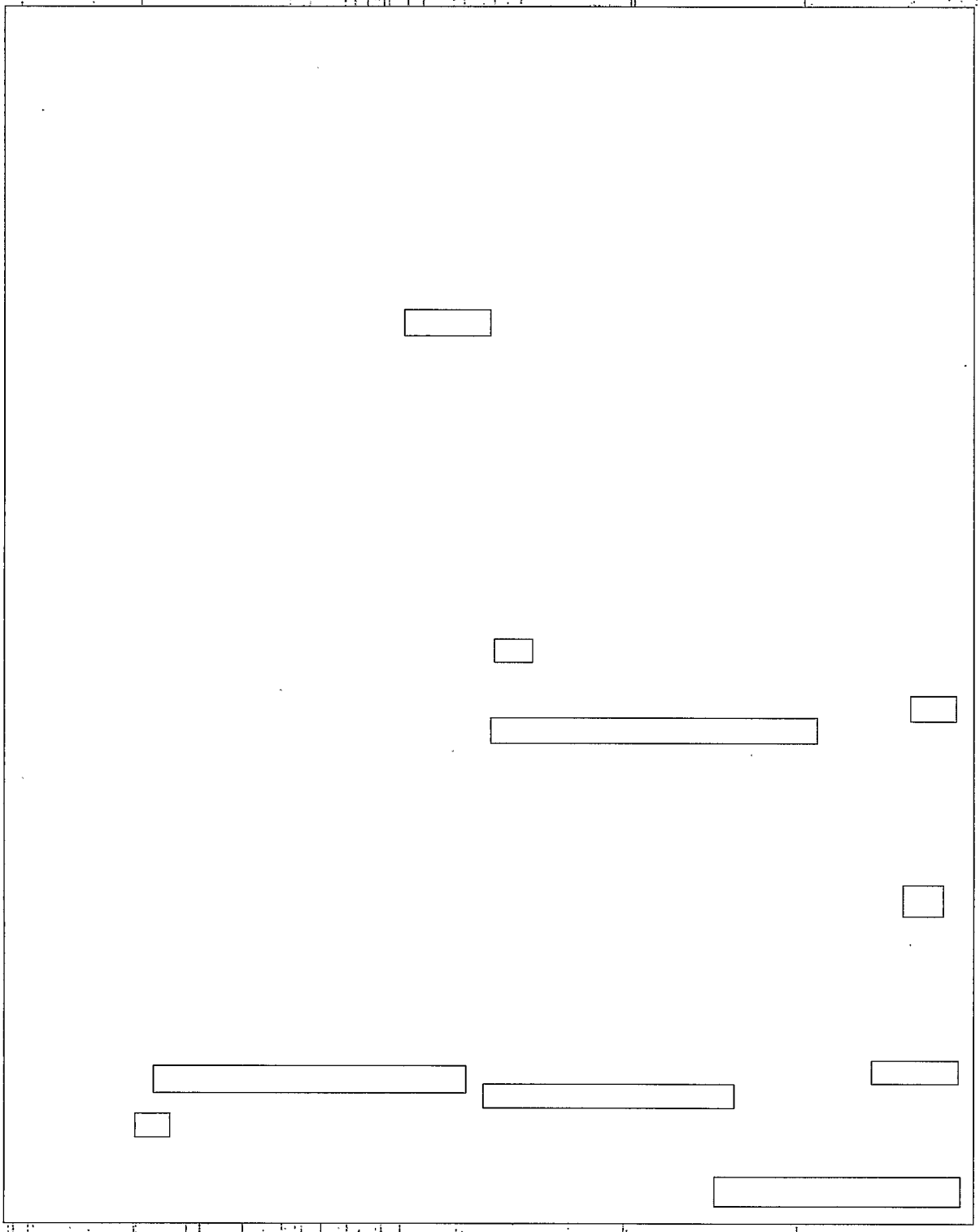
priorities and Argentina's economic difficulties, it may be unrealistic to expect this expensive program to receive funding adequate to complete it in the near future.

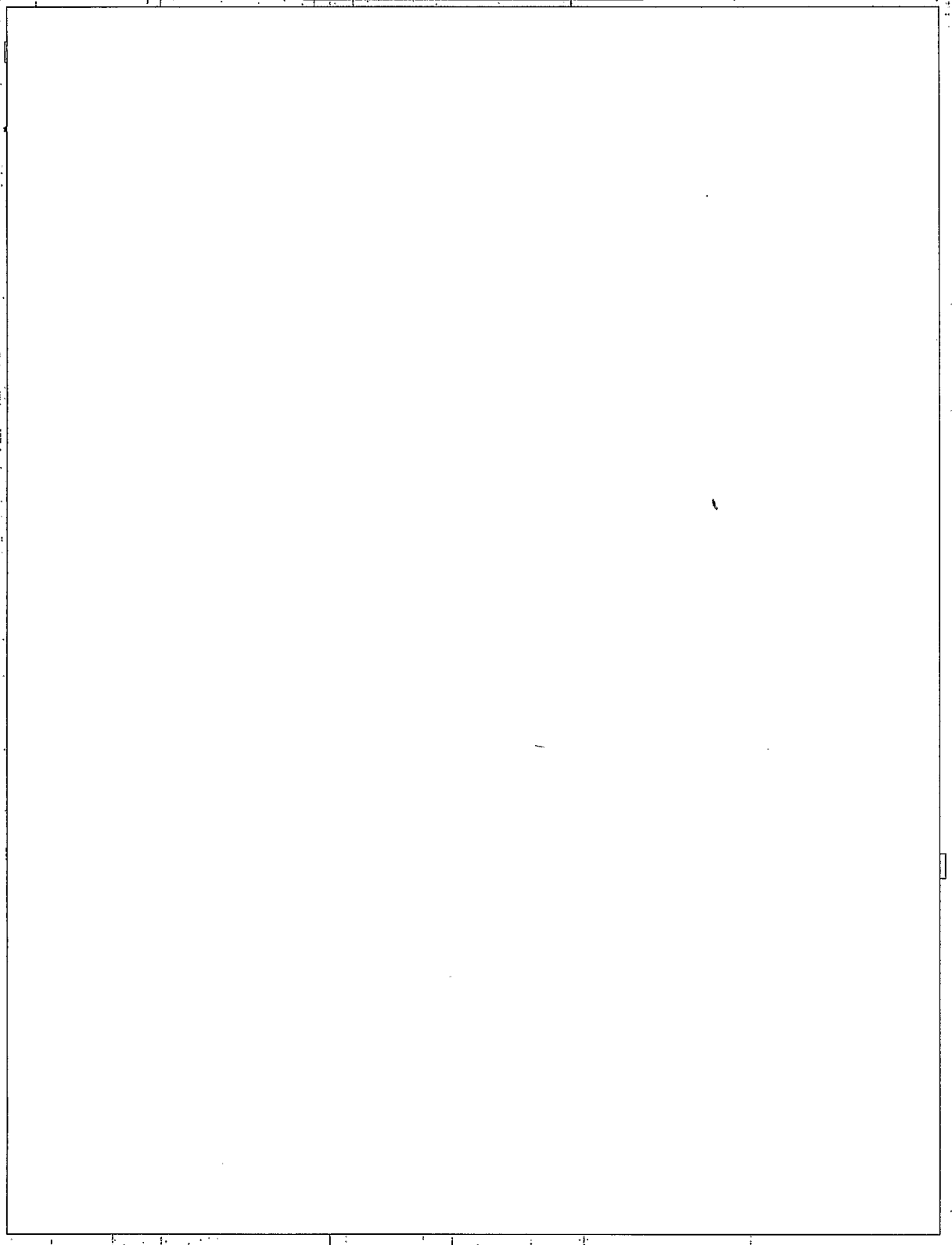
13. Technically, Argentina will be confronted with several problems that may inhibit the successful completion and operation of the facility. The experiences of other countries that have developed the gaseous diffusion process suggest that Argentina will have considerable trouble.[1] For example, other countries have had difficulties with welding the equipment adequately to prevent leakage of UF_6 gas. During initial operation, other countries have also had vibrational problems that cause the barrier tubes to break. The barrier tubes also can plug, causing a loss of separative work capacity. In addition, although Argentine scientists may have succeeded in a "proof of principle" in separating uranium isotopes via the gaseous diffusion method, this in itself does not guarantee success in expanding to large-scale production.

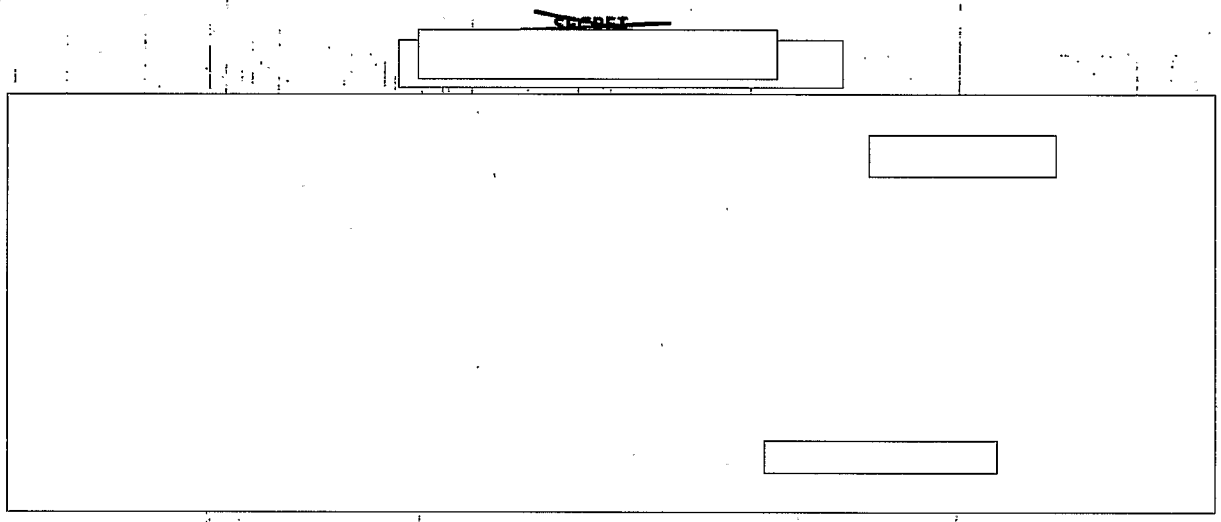
14. Argentina may also have considerable difficulty, moreover, in acquiring the specialized equipment needed for completion—compressors, vacuum pumps, flow meters, and so forth. Despite the Argentines' claims of domestically manufacturing compressors for the enrichment plant, These materials may be very difficult to obtain now as foreign suppliers tighten up on their exports to Argentina.

15. All of these problems can be and have been overcome by others at great expense and cost of time and effort. However, because of the above factors, we judge that the gaseous diffusion plant, as projected by Argentina, is not likely to be fully operational before the end of this decade.

[1]







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