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The Director of Central Intelligence
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National Intelligence Council

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EXECUTIVE BRIEF

Cuba's Nuclear Power Program

- **The completion of the first of two Soviet-supplied nuclear reactors at Juragua will probably slip to late 1994 or 1995 because of construction and supply problems.**
- **We have some concerns about the quality of the construction and more serious concerns about the ability of the Cubans to maintain and safely operate the facility over the longer term. Nonetheless, these reactors have adequate containment structures, and we believe that an accident involving a massive release of radioactive material is unlikely.**
- **The Soviets are likely to reject stopping construction of the Juragua plant, but they might be willing to slow construction to allow safety inspections.**
- **It is unlikely that the Cubans could complete the Juragua reactors without Soviet assistance, but if they managed to arrange for new suppliers and advisers from other countries and complete a makeshift facility, the prospect of a serious accident would substantially increase.**
- **We do not believe the Soviet-supplied reactors pose a nuclear weapons proliferation threat. The Soviets require International Atomic Energy Agency (IAEA) safeguards on reactors and fuel they supply to other countries; the Juragua facility is so safeguarded.**

This Executive Brief was requested by Assistant Secretary of State for Inter-American Affairs Bernard Aronson. It presents the findings of Intelligence Community representatives at a meeting held 12 June 1991. It was produced by the National Intelligence Officer for Latin America with the assistance of the National Intelligence Officer for Science, Technology, and Proliferation and the National Intelligence Officer for USSR and coordinated with representatives of State/INR, DIA, NSA, CIA, and the Services.

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Fidel Castro is firmly committed to completing the two nuclear power reactors under construction at the Juragua nuclear power plant near Cienfuegos. We believe that the basic reactor design is sound. The reactors are similar to 26 other VVER-440 reactors that have been operating successfully in the Soviet Union, Finland, and East Europe since 1972. The Cuban reactors have a fundamentally different design from the reactor that exploded at Chernobyl in 1986. Moreover, the Cuban reactors are being upgraded with a Soviet-designed containment structure. They meet Soviet safety standards, though they would not fully satisfy standards enforced in the United States and West Europe.

Progress at the Juragua Plant

Some 10,000 Cubans—including about 1,000 skilled workers and managers—are working at the site. About 70 to 80 percent of the work on the first reactor complex has been done, but even at the present rate of construction it will not be completed before the end of 1993. We believe, moreover, that the completion date will probably slip to late 1994 or 1995 because of construction problems, as well as more assertive enforcement of safety standards by Cuban officials. In addition, construction will probably be slowed by delays in shipments of parts and materials from the USSR as a result of the economic and other problems there.

About 150 Soviet specialists including engineers, welders, technicians, and mechanics were present when construction began at Juragua in 1983; their numbers increased to more than 400 last year, according to press reports, and were expected to increase further as the planned start-up date approached. [redacted]

[redacted] a large number of Soviet advisers were withdrawn from Juragua this year; it is not clear how this might affect the quality and pace of construction.

Status of Cuba's Research Reactors

Cuban and Soviet press reports indicate that the Castro regime has a nuclear research facility outside of Havana. It has a small (100 watt) Hungarian reactor that uses very small amounts of Soviet nuclear fuel. Groundbreaking for a planned 10 megawatt reactor took place in May 1988 and the reactor components reportedly are in Cuba. If they have been delivered, the Cubans could have the facility operating by the mid-1990s.

Intelligence Community analysts agree that it is unlikely the research facilities could be used for nuclear weapons development and that they do not pose a significant safety threat. An accident at either facility would result, at worst, in low levels of fallout in a very localized area.

Safety Concerns

Although large numbers of Cubans have received nuclear-related training in the Soviet Union and Eastern Europe, and

many have acquired practical experience working in power plants, we have some concerns about the quality of construction and particularly about the ability of the Cubans to maintain and safely operate the facility over the longer term. Nuclear facilities require constant equipment checkout and preventive maintenance.

- [redacted] doubted the ability of the Cubans to operate the plant and criticized their preventive maintenance practices.
- [redacted] Cuban workers had difficulty understanding Soviet requirements for the reactors.
- [redacted] while the top Cuban specialists at Juragua are well trained and capable, other Cubans working there were unqualified political appointees.
- Finally, as economic conditions and the morale of the labor force continue to deteriorate in Cuba, construction and maintenance problems at the plant are likely to get even worse.

Nonetheless, massive releases of radioactive material, even during severe accidents, are unlikely because of the containment structures of the Cuban reactors.

The Soviet Perspective

The Soviets are committed to completing construction at Juragua. Moscow is still protective of its relationship with Havana and is likely to reject ending its nuclear cooperation with Cuba or its construction of the plant.

Soviet leaders hope to export to other countries nuclear power plants based on the Cuban model and have consistently defended the safety of the reactors under construction. They emphasize that Soviet experts are training the Cubans to operate the facility and will oversee the start-up, testing, and adjustment periods. They also plan to provide technical supervision to the Cubans for two years after start-up.

Because of recently revived international concerns about the safety of the Cuban reactors and sensitivities about Chernobyl, however, Moscow may agree to press Havana to purchase Western technology (some of which is protected by COCOM controls) to improve the safety of the Juragua facility.

In return, Soviet officials may expect the United States to enter into a dialogue with the Castro regime about the safety of the reactors. They would hope that such talks would facilitate a general thaw in US-Cuban relations and possibly elicit tacit US certification of the safety of the Soviet-designed plant.

Moscow Might Slow Down Construction

Soviet leaders may agree to deliberately slow down construction and allow an international safety inspection, thus pushing the completion date into the mid- or late-1990s. This would be more likely if Cuba's Caribbean and Latin American neighbors and the United States expressed strong concerns about the safety of the plant.

Soviet officials insist that the reactor is safe, however, and would not agree to investigate a lengthy list of safety concerns. Furthermore, we believe that on-site inspection of construction problems by objective outside observers would require as many as 100 technicians and experts over a period of six to 12 months.

Alternatives to Soviet Assistance

If the Soviet Union terminated its support for the construction of the Juragua plant, the Castro regime would be very hard pressed to finish it. It would require advanced technology from countries with nuclear power programs.

- Czechoslovakia is the best alternative from a technical standpoint, although Finland also could provide some technical assistance. Neither country would be likely to help the Cubans for political reasons. Even if willing, both countries probably would insist on being paid in hard currency--which Havana could not afford.

- Hungary has a nuclear power program and is active on the export front but could not by itself replicate the Soviet role at Juragua.
- China has not yet demonstrated the ability to export nuclear power plants. It could supply substantial technical assistance to Havana, but it almost certainly could not complete Juragua.
- Argentina and India probably do not have the appropriate technology.
- North Korea is believed to be developing a nuclear weapons capability but would be unable to provide significant help to the Juragua program.

Thus, we believe, in the absence of Soviet assistance, that it is unlikely that the Cubans could cobble together suppliers and advisers from elsewhere to complete the Juragua reactors. If they succeeded in doing so, we believe that the chances of serious accidents would substantially increase.

The Difficulty of Acquiring Nuclear Fuel

Even if Havana were to complete the Juragua facility--either with continued Soviet support or in some other manner--it would still have to acquire nuclear fuel to run the reactor. Moscow would be likely to require a period of safety and operational certification before shipping and loading nuclear fuel. Soviet bureaucratic entities responsible for

nuclear safety probably could block the initiation of the reactor until officials were convinced that the plant met Soviet safety standards. Rules and enforcement procedures have become more stringent since the Chernobyl disaster.

Fueling the Cuban reactor could become a politically sensitive issue in the USSR. The Soviet public, some officials, and influential spokesmen have become more concerned about nuclear safety issues, and a public debate over providing the fuel to Havana would be likely.

If the Soviets refused to supply nuclear fuel, Cuba could go to only a few possible alternative suppliers.

- **China**--a nonsignatory of the Non-Proliferation Treaty (NPT)--would be the most likely supplier of fuel. The PRC has exported both natural and enriched uranium in the past, but their fuel rods may not meet the technical specifications of the Juragua plant.

- The URENCO consortium (Great Britain, Germany, and the Netherlands) could supply the fuel, but international restrictions and their adherence to full-scope safeguards on their exports would preclude them as suppliers.
- France also could supply the fuel, but the French have promised to require full-scope safeguards for their nuclear fuel exports.
- Argentina's ability to fabricate fuel that meets the specifications of the Juragua plant is doubtful.

Weapons Proliferation Implications

It is highly unlikely that the Soviet-supplied reactors at Juragua could be used for nuclear weapons development. The Soviet Union requires that reactors and fuel supplied to other countries be placed under IAEA safeguards, subject to periodic inspections. The Juragua facility is safeguarded.