

Nuclear Threat Reduction CAMPAIGN

A program of Vietnam Veterans of America Foundation
and The Justice Project

BRAZIL

I. The Issue

Brazil's nuclear program recently became a focus of attention when Brazil announced that it was developing a uranium enrichment plant in Resende and then denied International Atomic Energy Agency (IAEA) inspectors access to part of a uranium enrichment plant in Resende. Uranium enrichment facilities are of particular concern because they can both produce low-enriched uranium (LEU) for use as power generating reactor fuel and, simply by continuing the enrichment process further, produce highly enriched uranium (HEU) for nuclear weapons.

Background

The roots of Brazil's nuclear programs go back to research on nuclear fission in the early 1930's and the discovery of vast deposits of uranium, the world's sixth largest,¹ in the mid-1930's.²

In 1957-60, Brazil built two research reactors with U.S. support under the Atoms for Peace program, under which the U.S. shared nuclear technology but retained control over the nuclear processes.³

In 1956, Brazil's President Juscelino Kubitschek, seeking to spur indigenous nuclear capabilities, appointed a Congressional Investigating Committee, which in turn recommended nuclear endeavors independent of the United States. This eventually led, in 1962, to the establishment of Brazil's National Nuclear Energy Commission (CNEN), which is responsible for the planning and control of Brazil's nuclear programs.⁴ In 1965, Brazil built its first indigenous research reactor, with the U.S. supplying medium-grade enriched uranium for fuel.⁵

Dissatisfied with U.S. controls and the unreliability of U.S. supplies, Brazil in 1975 signed an agreement with West Germany for the transfer of eight reactors, a uranium enrichment facility, "jet nozzle" enrichment technology, and a pilot-scale plutonium reprocessing plant. The United States objected to the agreement, which lacked requirements for safeguards (inspections to protect against diversion of materials and technology to military purposes) and provided for the first-ever transfer of technology for a complete nuclear fuel cycle, including both uranium enrichment and the reprocessing of spent fuel, which could produce separated plutonium. However, the U.S. was able to convince West Germany to impose "stringent safeguards."⁶

The first power-generating reactor produced under the 1975 agreement, the Angra I plant, began to operate commercially in 1983. Construction of Angra II began in 1977, but the reactor did not come on line until 2002.⁷

Despite safeguards under the agreement with West Germany, between 1975 and 1990, Brazil transferred technology from its power-plant projects to a secret weapons program, code-named “Solimões.”⁸ Also, during the 1980’s, Brazil’s navy developed the capability to produce highly enriched uranium (HEU) for use in submarine reactors; and some expressed concern that the HEU might have been intended for weapons use also.⁹

However, in 1990 President Fernando Collor de Mello exposed the military plan to develop an atomic bomb¹⁰ and announced to the UN Brazil’s rejection of a nuclear weapons program.¹¹ Also, a Brazilian Congressional investigation uncovered secret bank accounts that CNEN had used to fund the military program, the fact that designs had been drawn up for two atom bombs, and the 1981 sale of eight tons of uranium to Iraq.¹²

During the 1980’s, Brazil and Argentina, defusing what was becoming a nuclear rivalry, entered into a number of agreements on the peaceful use of nuclear energy and technical cooperation.¹³

On November 28, 1990, and July 18, 1991, the two countries entered into additional agreements in which they committed to exclusively peaceful uses of nuclear energy and established both a system and a binational agency (ABACC) for accounting for and controlling nuclear materials.¹⁴ Then on December 13, 1991, Brazil, Argentina, the ABACC, and the IAEA signed an agreement that provides for full IAEA safeguards of the two countries’ nuclear facilities and allows the states to retain full rights over any technological secrets and to develop nuclear propulsion for submarines.¹⁵

On May 30, 1994, Brazil deposited its final instruments of ratification of the Treaty of Tlatelolco (TT), which established Latin American and the Caribbean as a nuclear-weapons-free zone; and on September 18, 1998, Brazil deposited its instrument of ratification of the Nuclear Nonproliferation Treaty (NPT).¹⁶

It should also be noted that the Brazil constitution permits nuclear activity only for peaceful purposes.¹⁷

Brazil’s accessions to the NPT and TT were delayed by significant internal opposition. Some argued that the NPT discriminates against non-nuclear-weapon states.¹⁸

Current Situation

Despite Brazil’s NPT and TT membership and its constitution, some observers believe that Brazil may be seeking a nuclear-weapons capability. They note that Brazil’s nuclear program is primarily under the control of its military, which resents IAEA inspections.¹⁹

Brazil's leftist President Luiz Inacio Lula da Silva, following his election in October 2002, hinted in a speech to military leaders that he intended to resume Brazil's military nuclear research program. "Why is it that someone asks me to put down my weapons and only keep a slingshot while he keeps a cannon pointed at me?" da Silva asked.²⁰

In recent years, Brazil has sought to take advantage of its large uranium supply by creating an enrichment facility at Resende.²¹ Enriching uranium means increasing the level of the isotope U-235, the isotope that contributes to fission, from the level at which it appears in uranium as it is mined—about 0.7%. To produce fuel for power reactors, uranium is enriched to a level of 3% to 5% U-235, where it is referred to as low enriched uranium (LEU). To enrich uranium for use in nuclear weapons means continuing the same process up to a level at which the U-235 isotope is 20% to 90%, at which point it is called highly enriched uranium (HEU) and is weapon-usable.

Brazil may be enriching uranium in order to sell LEU to others for use in energy production, as well as producing fuel for its own power-generation purposes.²²

In April 2004, a controversy arose when Brazilian officials would not give IAEA inspectors full access to the Resende enrichment facility, which was expected to begin operations in October 2004.²³ Brazil claimed that keeping some equipment out of view was necessary to protect proprietary information regarding what a Brazilian official called "technological breakthroughs."²⁴

The Brazilian government claimed that it was following its safeguard agreement, claiming that it wished to preserve two principles: One principle "should allow the Agencies [the IAEA and the ABACC] to have effective control over the nuclear material being used"; and the other "should enable Brazil to protect proprietary rights of the technology it has developed and its ensuing trade interests."²⁵

Brazil claims that its technology was developed domestically. However, Henry Sokolski of the Nonproliferation Policy Education Center, based in Washington, DC, says that an IAEA contact told him that the agency suspects that Brazil purchased the centrifuges from the A.Q. Khan network.²⁶ Likewise, a recent *Washington Post* article noted that IAEA inspectors want to inspect the Resende facility, not just to be sure that no weapons-grade material is produced, but also "as part of their investigation of global supply networks, including the ... [A. Q. Khan network]. Diplomats and nuclear experts said the IAEA wants to learn more about the origin of the program in Brazil and its sources of supply."²⁷ Another expert, David Albright, president of the Institute for Science and International Security, also based in DC, who in the 1980s worked with Brazilian physicists on the plan to open Brazil's nuclear program to outside inspection has a slightly different view. He says, "They [Brazil] never came clean about their illicit procurement and jealously guarded their secrets." Thus, Dr. Albright states that they may fear the uncovering of past illicit purchases other than through A.Q. Khan.²⁸

Moreover, whether Brazil has developed centrifuges involving any scientific breakthroughs seems open to question; and some question why Brazil does not rely on patents to protect any such advances.²⁹

In October 2004, it was reported that the IAEA wants Brazil to allow installation of cameras to monitor the centrifuges enriching the uranium but that Brazil made a proposal for inspections without giving full visual access and the IAEA will send a team to Brazil in mid-October to review that plan.³⁰

The situation in Brazil poses two major problems for the United States. First, President Bush's February 11, 2004, speech at the National Defense University aimed at preventing any additional countries from acquiring a nuclear fuel production capability, which always entails the ability to produce nuclear weapons materials, by denying them the necessary technology. For Brazil to move forward with the development of an indigenous nuclear fuel cycle would set a precedent inconsistent with President Bush's statement that his approach would "prevent new states from developing the means to produce fissile material for nuclear bombs."³¹ One analyst referred to Brazil's moving ahead at Resende as making "mincemeat" of the president's speech.

Second, if Brazil does not reach an agreement with the IAEA on an inspections process, the United States will have to decide whether to condemn Brazil's noncompliance or to overlook it. The former response would certainly be greeted with a cry of outrage on the part of Brazil, which has already bristled at the notion that it is being compared to Iran, another country moving toward the development of an indigenous nuclear fuel cycle. Ironically, although Iran is suspected of having designs on a nuclear weapons program, in contrast to Brazil, it has signed the Additional Protocol under the NPT and has stated no objection to the most comprehensive and intrusive IAEA inspections.³²

Choosing the latter option—overlooking Brazil's noncompliance—would leave the U.S. open to a charge of creating a double standard and increase the difficulty of bringing enforcement action against any other country that refuses to allow full safeguard inspections. Certainly, a state's claim that inspections must be curtailed because it plans to use nuclear energy for solely non-military purposes or because full inspections would endanger its trade secrets would leave the NPT safeguard agreements meaningless and cannot be accepted.

So far, the United States has been pursuing the path of both publicly accepting Brazil's protestations that it has no intention to develop nuclear weapons³³ and urging Brazil not just to comply with its current safeguard agreement, but also to sign the Additional Protocol providing for even greater transparency in its nuclear programs.³⁴

This position of straddling the fence may make sense for the short run, but the U.S. likely will have to come down on one side or the other after the Brazil-IAEA talks are concluded in November 2004. Clearly, the stakes are very high in terms of both enforcing safeguard agreements and preventing additional countries from developing a nuclear fuel cycle, which includes the ability to produce materials for nuclear weapons.

II. Recent Legislation

None.

III. Obstacles

- Brazil has nearly completed construction of a facility at Resende that will be able to enrich uranium and has so far denied IAEA inspectors access to parts of the facility—denying that full access is necessary because Brazil has no plan to develop nuclear weapons and alleging that restricting access is necessary to protect proprietary information.
- However, there are suspicions that Brazil may have acquired some of the enrichment equipment from the A. Q. Khan network or another illicit source.³⁵
- The Administration seeks to prevent additional countries from developing complete nuclear fuel cycles because the uranium enrichment or fuel reprocessing facilities that they would build would also give them the ability to produce materials for nuclear weapons—HEU or separated plutonium. However, so far, the Administration has taken no action to dissuade Brazil from doing so.
- Construction of the facility at Resende is expected to be complete in November 2004.
- To date, Brazil and the IAEA remain at odds as to whether Brazil’s refusal to allow inspection of the entire Resende plant is consistent with Brazil’s obligations under its safeguard agreement with the IAEA. IAEA-Brazil talks in November may clarify the situation.
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IV. Q & A

Q. As Secretary of State Colin Powell has made clear, the United States does not suspect Brazil of having a secret nuclear weapons program.³⁶ Why, then, should the United States support the IAEA in insisting upon access to the Resende facility under Brazil’s safeguard agreement?

A. Regardless of whether U.S. intelligence or other information leads the U.S. government to conclude that a particular country does or does not have a plan to develop nuclear weapons, it is essential that the safeguard agreements be applied uniformly. The U.S. should not, by giving a country such as Brazil special consideration, give other countries grounds to complain that a double standard is being applied to them.

Nor would it be wise for the U.S. to rely on possibly faulty information with regard to a particular country’s plans. The case of Iraq is informative. One of the main justifications for invading Iraq in March 2003 was that Iraq was reconstituting its nuclear weapons program.³⁷ However, the September 30, 2004, Duelfer report concluded that not only had Iraq not done so, its “ability to reconstitute a nuclear weapons program

progressively decayed” after 1991 and Iraq “had no formal written strategy or plan for the revival of WMD.”³⁸

Also, the U.S. ought to want the IAEA inspection to confirm or rebut the suspicion that Brazil obtained some of the equipment through the A. Q. Khan network. If the suspicion proves to be well grounded, the information would be essential to developing as complete an understanding of that network as possible.

Q. Why would Brazil want to hide some of its nuclear enrichment equipment from IAEA inspectors?

A. The reason Brazil gives is that it wants to protect proprietary information, *i.e.*, trade secrets that would be revealed if the inspectors had visual access to the equipment.

However, it is not clear why Brazil believes that patent laws would not afford adequate protection. Also, there is suspicion that Brazil obtained some of the equipment through the A. Q. Khan network or other illicit sources.

Q. Do Brazil’s nuclear plans, which include developing a complete nuclear fuel cycle, also include the possibility of developing nuclear weapons?

A. Yes. Brazil claims that it wishes to enrich uranium for use as LEU in its own power-generating reactors and for sale to other non-nuclear-weapons states. However, since the ability to produce LEU also entails the ability to continue the enrichment process up to the point at which weapons-grade HEU is produced, the acquisition of a uranium-enrichment facility is a serious concern. One partial protection against Brazil doing so would be for it to sign an Additional Protocol, an agreement giving the IAEA a greater ability to detect the production of nuclear-weapons materials. However, Brazil has yet to sign an Additional Protocol.

President Bush, in his February 11, 2004, speech at the National Defense University, sought to fashion policies to prevent new countries from developing their own complete nuclear fuel cycles, including components such as uranium enrichment and spent-fuel reprocessing, which produces separated plutonium. The Director General of the IAEA, Dr. Mohammed ElBaradei, and many others share that same objective. The reason is based on the plain reality that the more countries there are that can produce the nuclear materials for atomic and hydrogen bombs the greater the risk is that one or some of them will begin to develop nuclear weapons—or that the fissile material is stolen or sold and ends up in the hands of terrorists.

V. Talking Points

- There is no reason to suspect Brazil of planning to build nuclear weapons.

- Secretary of State Powell may be right. Brazil’s intentions at this point may be perfectly innocent—that is, Brazil may simply wish to have control over its supply of LEU for its power reactors and may wish to earn income from the sale of LEU as reactor fuel to other countries.
- However, Brazil’s military has a track record of secretly seeking a nuclear weapons capability in the 1980’s.
- Moreover, Brazil’s reluctance—or perhaps unwillingness—to sign an Additional Protocol providing greater transparency of its nuclear activities, does not indicate an intention to be forthcoming about nuclear programs.
- Regardless of whether the U.S. believes Brazil when it says it has no plans for military use of nuclear energy, Brazil’s refusal to allow IAEA inspectors full access to its enrichment equipment both sets a bad precedent, inviting charges that a double-standard is being applied, and leaves concerns regarding the possibly illicit source of that equipment unanswered.
- If Brazil did obtain its enrichment equipment or the technology for it from an underground network—whether it was A. Q. Khan or not—the IAEA needs to know the answer in order to expose the facts and enable the UN Security Council to deal with the true situation.
- U.S. leadership appears to be needed in order to preserve the integrity of the NPT safeguard system from being undermined by the situation in Brazil.

VI. Applicable Treaties, Legislation, and Other International Agreements

- Nuclear Nonproliferation Treaty³⁹
- Treaty of Tlatelolco (establishing the Caribbean and Latin America as a nuclear-weapons-free zone)⁴⁰

¹ Industrias Nucleares do Brazil, “Uranium Reserves in Brazil,” accessed at: <http://www.inb.gov.br/english/reservasBrasil.asp>; Benjamin Keating, “Nuclear Issues: Brazil’s Nuclear Ambitions,” Center for Defense Information website (May 6, 2004), accessed at: [http://cdi.org/program/documents.cfm?StartRow=11&ListRows=10&Orderby=D.DateLastUpdated&ProgramID=32&TypeID=\(8\)](http://cdi.org/program/documents.cfm?StartRow=11&ListRows=10&Orderby=D.DateLastUpdated&ProgramID=32&TypeID=(8)).

² GlobalSecurity.org, “Nuclear Weapons Programs: Brazil,” accessed at: <http://globalsecurity.org/wmd/world/brazil/nuke.htm>.

³ *Ibid.*

⁴ *Ibid.*

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Jennifer L. Rich, “A New Nuclear Reactor Sheds Only Some Light on Brazil,” *New York Times* (August 2, 2000), accessed at: <http://www-personal.umich.edu/~sanders/214/other/news/080200brazil-nuclear.html>.

⁸ GlobalSecurity.org, *op. cit.*, note 2.

⁹ Chunyan Ma and Frank von Hippel, “Ending Production of Highly Enriched Uranium for Naval Reactors,” *The Nonproliferation Review* (Spring 2001), p. 86, accessed at: <http://cns.mii.edu/pubs/npr/vol08/81/81mahip.pdf>, citing Rodney W. Jones and Mark G. McDonough,

Tracking Nuclear Proliferation 1998 (Washington, DC: Carnegie Endowment for International Peace, 1998), pp. 231-232.

¹⁰ GlobalSecurity.org, *op. cit.*, note 2.

¹¹ Benjamin Keating, *op. cit.*, note 1.

¹² GlobalSecurity.org, *op. cit.*, note 2.

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ Agreement of 13 December between the Republic of Argentina, the Federative Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the Application of Safeguards, accessed at:

<http://www.iaea.org/Publications/Documents/Infcircs/Others/inf435.shtml>.

¹⁶ United Nations Institute for Disarmament website, accessed at:

<http://disarmament.un.org:8080/TreatyStatus.nsf>.

¹⁷ Article 23, paragraph XXIII(a) of the Constitution of the Federative Republic of Brazil, accessed at:

<http://webthes.senado.gov.br/web/const/const88.pdf>.

¹⁸ GlobalSecurity.org, *op. cit.*, note 2.

¹⁹ *Ibid.*

²⁰ Kevin G. Hall, "Brazil, China weigh nuclear trade deal: Global Security experts see reason to fear Brazil's march toward nuclear expertise," Knight Ridder Newspapers (May 26, 2004).

²¹ Benjamin Keating, *op. cit.*, note 1.

²² Peter Slevin, "Brazil Shielding Uranium Facility; Nation Seeks to Keep Its Proprietary Data from U.N.," *The Washington Post* (April 4, 2004), p. A1.

²³ Vivian Sequera, "Brazil Attacks Nuclear Reports," Associated Press (October 1, 2004), accessed at:

<http://www.lasvegassun.com/sunbin/stories/w-sa/2004/oct/01/100105326.html>.

²⁴ Peter Slevin, *op. cit.*, note 22.

²⁵ Brazilian Government Press Release On The Brazilian Nuclear Program, Issued on April 5, 2004, as published by the Consulate General of Brazil, San Francisco, accessed at:

http://www.brazilsf.org/brazil_press.htm.

²⁶ Vivian Sequera, *op. cit.*, note 23.

²⁷ Peter Slevin, *op. cit.*, note 22.

²⁸ "Diplomats: IAEA, Brazil Reach Agreement," Associated Press (October 6, 2004), accessed at:

<http://channels.netscape.com/ns/celebrity/story.jsp?id=2004100614310001193988&dt=20041006143100&w=APO&coview=>.

²⁹ *Ibid.*; and Vivian Sequera, *op. cit.*, note 23.

³⁰ Michael Smith, "Brazil to Limit Uranium Plant Access as Powell Visits," Bloomberg.com (October 4, 2004), accessed at:

http://quote.bloomberg.com/apps/news?pid=10000086&sid=aQDiWxsOIP50&refer=latin_america.

³¹ The speech can be accessed at: <http://www.whitehouse.gov/news/releases/2004/02/20040211-4.html>.

³² The suspicion in Iran's case is that it may be planning eventually to withdraw from the NPT and evict IAEA inspectors at some point after it has completed the construction of an indigenous nuclear fuel cycle and then proceed to manufacture nuclear weapons at that point. See the paper on Iran in this publication.

³³ Steven R. Weisman, "Warming to Brazil, Powell Says Its Nuclear Program Isn't a Concern," *New York Times* (October 6, 2004), accessed at:

<http://www.nytimes.com/2004/10/06/international/americas/06diplo.html>.

³⁴ Michael Smith, *op. cit.*, note 30.

³⁵ See the text accompanying notes 26-28.

³⁶ Eric Green, "United States Confident Brazil Is Not Pursuing Nuclear Weapons: Secretary of State Colin Powell discusses issue with Brazil's 'TV Global,'" Department of State, USINFO website accessed at:

<http://usinfo.state.gov/wh/Archive/2004/Oct/06-528122.html>.

³⁷ Arms Control Association, "Fact Sheet: Bush Administration Statements on Iraq's Prohibited Weapons," accessed at: http://www.armscontrol.org/pressroom/2003/adminstmtsiraq_july03.asp.

³⁸ *Comprehensive Report of the Special Advisor to the Director of Central Intelligence on Iraq's WMD* (September 30, 2004), accessed at: <http://news.findlaw.com/hdocs/docs/iraq/dciwmd93004kf.pdf>

³⁹ The treaty can be accessed at: <http://www.state.gov/t/np/trty/16281.htm#treaty>.

⁴⁰ The treaty can be accessed at: <http://www.state.gov/www/global/arms/treaties/latin1.html#2>.