

## Brazil and the Bomb

Vexing nuclear activities in South America

Hans Rühle | **Brazil is almost certainly developing nuclear weapons. There is no definitive proof yet. However, the country's earlier nuclear weapons programs and the policy of President Lula da Silva's government suggest that Brazil's quest for power and international recognition will ultimately lead her to discard her commitment to non-proliferation and put an end to President Obama's vision of a world free of nuclear weapons.**

In October 2009 the renowned American journal "Foreign Policy" published an article entitled "The Future Nuclear Powers You Should Be Worried About." It argued that after Iran, the next candidates for the illustrious club of nuclear-armed states were Burma (Myanmar), Bangladesh, Kazakhstan, the United Arab Emirates and Venezuela. However, even though the author presented a number of interesting arguments for this prognosis, his list failed to include the most important potential member of the nuclear club: Brazil.

Brazil is currently held in high regard by the rest of the world. Its president, Luis Inácio Lula da Silva, has become a star on the international stage. "This is my man, right here," said Barack Obama on meeting the Brazilian president at last year's G-20 summit. Eminent visitors from all over the world have been beating a path to his doorstep. Lula da Silva even got away with receiving the current interna-

tional bogeyman, President Ahmadinejad of Iran, with full state honors and demonstratively supporting Iran's internationally suspect nuclear program.

Lula da Silva has good reason for such displays of self-confidence. Under his leadership Brazil, the world's fifth-largest nation, has emerged as an international economic powerhouse comparable with China and India. At the beginning of 2010, the Brazilian president was presented with a "Global Statesmanship Award" at the World Economic Forum in Davos. He is the first recipient of this prize, which recognizes the achievements of political leaders who have used their position to "improve the world"—in his case by enabling the poor and socially disadvantaged to participate in their country's newfound economic growth.

However, Lula da Silva is not only an embodiment of economic ascendancy but also of Brazil's claim to

power and influence based on its new-found economic clout. This is evident in the “National Defense Strategy” that the Brazilian leader presented at the end of 2008. Apart from stressing the need to modernize Brazil’s armed forces and defense industry, the NDS includes the key tenet that Brazil can only achieve national independence and international prominence by mastering sensitive technologies in the strategic sectors of space, cybernetics, and “nuclear affairs.” The document leaves no doubt that Brazil regards mastery of the complete nuclear fuel cycle and the inclusion of nuclear-powered submarines in its defense network as essential to its leadership role at both the regional and international levels.

After signing an agreement with France on December 23, 2008 to build several submarines, including one designated to be equipped with nuclear propulsion by the Brazilians themselves, Lula da Silva said, “Effective military capabilities are indispensable to the transformation of our country into a power that is respected by the whole world... Brazil has to embody the greatness God gave it when He created the world.” The minister for strategic affairs, former Harvard professor Roberto Mangabeira Unger, went one better by proclaiming, “Brazil is arming itself!” These kinds of pronouncements by the Brazilian leadership have raised doubts regarding the defensive orientation of the Brazil’s security policy and the limitation of its nuclear activities to the production of small reactors for submarines. And there are good reasons for such doubts. Between 1975 and 1990 Brazil ran several secret

nuclear programs. At the time the internal justification for one of these secret programs was also the avowed intention to build nuclear-powered submarines and to develop small reactors for this purpose. There has never been any official declaration of the military goals Brazil was really pursuing or of the stage the programs had reached by the time they were wound up.

Brazil’s entry into the nuclear world dates back to 1953, when the government attempted to buy ultracentrifuges from West Germany. The United States obstructed the sale and then in 1955 signed its own agreement with Brazil on peaceful nuclear cooperation. The United States subsequently provided Brazil with its first research reactor in 1957 and its first nuclear power plant in 1971, the light-water reactor Angra I. In 1975 West Germany agreed to provide Brazil with facilities for a complete nuclear fuel cycle and between eight and ten nuclear power plants. The International Atomic Energy Agency (IAEA) was to monitor all facilities included in the deal, although at this time Brazil had still not signed the nuclear Non-Proliferation Treaty (NPT). The collaboration between Germany and Brazil did not prove a success. When the agreement quietly expired 15 years later, Brazil found itself with a half-finished nuclear power plant and a conceptually flawed enrichment program.

A fundamental reason for the failure of this large-scale civil nuclear program lay in the government’s secret “parallel program” to develop an atomic bomb, which also began in

1975 and was given absolute priority as a result of Brazil's increasing rivalry with Argentina. Each branch of the military pursued its own program to produce fissile material. The army focused on producing plutonium using a graphite reactor fueled by natural uranium; the air force opted for laser enrichment; and the navy attempted to manufacture highly enriched uranium with imported high-speed centrifuges and uranium hexafluoride, also imported.

Progress varied. The army failed early and comprehensively. Although the air force also had little success with its enrichment program, it did manage to complete a number of studies on nuclear weapons systems and construct a 300-meter-deep shaft for

All participants in the nuclear program agreed that they needed to test with a peaceful explosion.

testing nuclear weapons. The most promising concept proved to be the navy's, and its centrifuge-based enrichment efforts soon came to dominate the entire "parallel program." Its plan to develop small reactors using enriched uranium for nuclear submarines remained unchallenged. Nevertheless, all participants basically agreed that at some point the nuclear capability produced needed to be tested with a "peaceful nuclear explosion."

In 1981 the navy installed its first centrifuge, and in autumn 1984 it brought a mini-cascade of nine centrifuges online. In September 1987—after the end of military rule—the navy announced publicly that it had mastered the enrichment process. In addition, the president at the time, José Sarney, admitted that "laboratory

tests" had achieved an enrichment level of 20 percent, which led a number of commentators to predict that Brazil would have nuclear weapons by the end of the millennium.

This was not to be. With the election of Fernando Collor de Mello's government in 1990, the "parallel program" came to an end. Because of persistent rumors that the military was still pursuing the program on its own initiative, the president even took the symbolic step of shoveling lime into the test shaft built by the air force, making it clear to all Brazilians that the government was "burying" the "parallel program." A week later the president announced that Brazil was rejecting "the idea of any test that implies nuclear explosions, even for peaceful ends." This was the first time that a Brazilian president had ever renounced the use of "peaceful nuclear explosions." There were good reasons for this declaration. In 1988 Brazil had already adopted a new constitution that limited nuclear activities to "peaceful uses." This formal ending of the "parallel program" initiated a discussion both in Brazil and abroad about what it had actually involved and just how far it had come.

Even though the secrecy of the program meant that facts were hard to come by, a general consensus soon emerged that the goal of the "parallel program" had been the development of nuclear weapons. Even in the early days of the program, President Ernesto Geisel responded to the perceived threat of Argentina's intent to acquire nuclear weapons by demanding similar efforts on Brazil's part: "Perhaps we can also develop a technology for the manufacture of nuclear weapons

like the others have.” However, by the time the program was terminated, it had produced only the technology, not the weapons themselves.

The fact that no bomb was actually constructed led some commentators to assume that the “parallel program” had merely been a “technology program.” This is nonsense. Ultimately every military nuclear program begins as a “technology program” and remains one for some time. Furthermore, an inquiry begun in 1990 by a Brazilian government commission into the “parallel program” brought a number of disturbing facts to light. According to the commission, an institution affiliated with the air force had designed two nuclear warheads, one of which had a capacity of 20 to 30 kilotons. The former president of the National Commission for Nuclear Energy, Jose Luis Santana, has claimed that around 1990 the Brazilian military came very close to producing an atomic bomb. According to Santana, the armed forces had already built several components of the bomb by early 1990 and had access to imported weapons-grade uranium.

Even though these statements need to be taken with a grain of salt, it is clear that the “parallel program” forming part of Brazil’s nuclear development until 1990 aimed to produce nuclear weapons. The navy’s own program was an exception in the sense that its initial phase was designed to build small reactors for nuclear submarines. It was therefore able to sidestep the halt ordered by the Collar de Mello government. However, in 1996 this program was also wound up. The official reason was a lack of money, but ultimately

the program was simply incompatible with the political atmosphere of the time.

Brazil now entered a phase marked by improved relations with Argentina, the development of civil nuclear facilities, and integration into the international non-proliferation regime. The historical rivalry between Brazil and Argentina that had intensified as a result of nuclear activities in the 1970s and 80s began to dissipate following the end of the military regime. In 1985 the two countries embarked on a phase of pragmatic cooperation in the nuclear field.

This was made easier by the fact that both states had been independently pursuing largely parallel nuclear policies. They had independently developed complete fuel cycles. Their nuclear facilities with clear military applications were not monitored.

Both countries generally rejected the idea of international non-proliferation and for a long time, refused to sign the NPT and subject themselves to its monitoring procedures. They distanced themselves from the Nuclear Suppliers Group and rejected the Treaty of Tlateloco, which aimed to establish Latin America as a nuclear-weapons-free zone. They both maintained the option of so-called “peaceful nuclear explosions,” and for years they were involved in questionable nuclear export activities, particularly in the direction of the Middle East.

All this came to a sudden end after 1990. In 1991 Brazil and Argentina signed an agreement renouncing their right to conduct “peaceful nuclear ex-

Improved relations with Argentina dramatically changed both countries’ nuclear policies.

plosions” and allowing both countries to inspect the other’s nuclear facilities. The agreement also marked the entry of both countries into the international nuclear non-proliferation regime. In 1994 Brazil signed the Treaty for the Prohibition of Nuclear Weapons in

Latin America and the Caribbean. In 1996 it also became a member of the Nuclear Sup-

The military resisted limiting its functions to supplying the civil nuclear industry.

pliers Group, and in 1998 it finally ratified the NPT and the Comprehensive Test Ban Treaty. However, there were troubling aspects to the path taken by Brazil during this period as well. These would not merit a mention here were it not for the fact that they are directly linked to the highly dramatic developments we are now seeing in Brazilian nuclear policy.

Although the goal of building a nuclear-powered submarine was formally abandoned in 1996, the following years saw repeated attempts to revive the project. A fundamental reason for this was the fact that the entire nuclear enrichment program remained under the control of the navy. There was resistance to the idea that Aramar Research Center, which was equipped with 1000 centrifuges, should now limit its functions to supplying the civil nuclear industry. Against this background, it was hardly surprising when in January 2000 the Brazilian government attempted to revive the submarine project. It failed because the parliament refused to approve the funding. However, political lobbying continued for the project, which had more or less developed an administrative life of its own. These efforts were rewarded when the Lula da

Silva government took office. In October 2003 the work on the development of a nuclear-powered submarine was officially resumed.

Cooperation with the IAEA also quickly became a problem for Brazil. The government was hesitant to provide facts on the country’s nuclear activities during the 1970s and 80s that the IAEA required for its first status report and eventually presented only incomplete information. The IAEA finally gave in and certified Brazil’s nuclear stocks and the design of its facilities. In the following years the nuclear watchdog was able to conduct its inspections unhindered.

However, this also changed once Lula da Silva became president. In April 2004 the Brazilian authorities refused to allow IAEA inspectors unrestricted access to a new enrichment plant in Resende. The centrifuges were concealed behind two-meter-high wooden panels that were supposedly there to prevent “technological piracy.” In any case, the Brazilians argued, the IAEA could still monitor whether critical material had been diverted. Although the IAEA reached a somewhat dubious compromise with the Brazilian government by the end of 2004, the question remained as to why there had been any obstruction in the first place.

A lively public debate ensued in which new motives and conspiracy theories seemed to crop up almost daily. It took on a hysterical note when the American magazine *Science* claimed that the facility in Resende had the potential to produce enough weapons-grade uranium for five to six warheads per year. However, all evidence seems to suggest that conceal-

ing the centrifuges was merely a measure to hide their dubious origins. Indeed, there are good reasons—backed up by a considerable amount of information—for assuming that all or some of the centrifuges installed in Resende can be traced back to the Pakistani nuclear smuggler Abdul Qadeer Khan.

In any event, the bizarre incident in Resende inevitably resulted in speculation that Brazil had something to hide when it came to its nuclear activities. Moreover, it indicated that the Lula da Silva government had its own nuclear agenda, something that was confirmed by the National Defense Strategy adopted in December 2008. As was to be expected, the first point this document addresses concerns the nuclear submarine program. However, it also contains a passage calling for an increase in “the capacity to use nuclear energy within a broad spectrum of activities.” Although the strategy confirms Brazil’s status as a signatory to the NPT it also states that Brazil will not agree to any additional NPT restrictions until the nuclear weapons states make more progress toward nuclear disarmament.

This not only signals a clear lack of confidence in the international non-proliferation regime but also—as has now been officially confirmed—a definitive refusal to sign up to the additional protocol to the NPT introduced in 1997 that allows for inspections of undeclared nuclear facilities. The rationale for this restrictive policy became clear at a meeting of the Nuclear Suppliers Group in January 2009, where Brazilian representatives energetically resisted adopting any obligation that could have resulted in

the nuclear submarine program becoming more transparent.

But why all that secrecy? What is it about its development of small reactors to power submarines that Brazil is so keen to hide? After all, for several decades most major powers have had access to systems of this kind.

The answer to this question is simple, yet it does not come easy. In the facilities that are declared as production sites for nuclear submarines Brazil is also most probably working on something else—nuclear weapons. In the Brazilian context this is not exactly sensational news. From the late 1970s onwards commentators repeatedly referred to the submarine program as a code or synonym for a nuclear-bomb program being conducted by the Brazilian navy. However, due to a lack of evidence this assertion did not result in any concrete action. Things changed when in November 2007 the Brazilian four-star general Jose Moreira, a senior official at the ministry of defense and a designated consultant to Brazil’s Permanent Mission to the United Nations, startled the public by stating, “If the government agrees, we

need to have the ability in the future to develop a nuclear weapon... The submarine program is clearly a cover for a nuclear bomb program.

We cannot be oblivious to the world’s reality... The world lacks water, energy, food and minerals. Brazil is rich in all of these. For this reason we must put a strong lock on our door.”

Although a few days later the Brazilian defense minister, Nelson Jobim, described the military nuclear option as nonsense, the genie was out of the bottle. At the end of September 2009

the Brazilian vice-president José Alencar gave an interview in which he expressed his support for arming Brazil with nuclear weapons in the future. He argued that for a country with a 15,000 kilometer border and rich offshore oil resources nuclear weapons were an important instrument of “deterrence” and also a means of increasing Brazil’s international standing. In this context he referred to the example of Pakistan, which, although poor, maintained a “comprehensive international presence—solely because it has nuclear weapons.”

When his interviewer pointed out that Brazil had signed the NPT, Alencar was unperturbed. This was not a problem, he said, and a matter that remained open to negotiation. Indeed

the Lula da Silva government has never accepted the NPT as a necessity, seeing it rather as a superficial re-

sponse by a former government to the supposed pressure of world opinion. In the 2003 election campaign Lula da Silva described the NPT as unfair: “If someone asks me to disarm and keep a slingshot while he comes at me with a cannon, what good does that do?”

It is quite probable that Lula da Silva has a similar attitude to the prohibition on the development and production of nuclear weapons enshrined in the constitution of 1988. Although this prohibition has not played a significant role in the current discussion, it is clear to everyone that the president could easily change the constitution in this respect. The immense authority he currently enjoys and a clear statement that there can be no justifi-

cation for the United States monopolizing nuclear weapons on the American continent would suffice to introduce such a change.

For the moment the constitutional prohibition is still in place. Brazil is still a signatory to the non-proliferation treaty, and the IAEA is still able to inspect all declared nuclear facilities. Is it possible to imagine a scenario in which Brazil is nevertheless engaging in the—illegal—construction of nuclear weapons? Unfortunately the answer is yes. Clearly, if Brazil is legally manufacturing small reactors for a nuclear submarine it needs access to nuclear material regulated by the IAEA. However, since Brazil has designated its production site for the nuclear submarine as a restricted military zone, IAEA inspectors no longer have access to it and thus cannot monitor whether the nuclear material is being put to any other uses. In other words, once the legally delivered enriched uranium is inside the gates of the production facility, it can be used for any purpose, including the construction of nuclear weapons.

We should not forget that Brazil is not a nuclear beginner but in fact has 15 years of research into nuclear weapons under its belt. Moreover, a conversion facility completed in 2010 has given Brazil complete control of the nuclear-fuel cycle and it can now produce all the necessary components on an industrial scale.

The project to build small reactors for submarines has another invaluable advantage for potential bomb-builders. Almost all nuclear submarines are powered by weapon-usable uranium (U-235), that is, uranium hexafluoride enriched to a level of 93

President Lula da Silva could easily change the constitutional prohibition on nuclear weapons.

percent. If Brazil decides to use such a configuration for its small reactors, then the government would have legitimate grounds for producing highly enriched uranium.

There are a number of reasons for suspecting that such considerations already played a role when the submarine program was initiated. The argument that the sister ships of the French Scorpène-class submarine to be equipped with Brazilian small reactors will be powered by low-enriched uranium (7-20 percent) is not really convincing. Brazil has obviously decided to develop its own variant and as yet we do not know what this will entail. In any case, it does not seem as if Brazil will have any problem enriching uranium to whatever concentration it wants.

When interviewing Mario Ferreira Bothelo, director of Brazilian enrichment activities, Klaus Kleber, maker of the award-winning documentary “The Bomb,” pointed out that producing highly enriched uranium was not technically difficult. Bothelo responded, “But that is not Brazil’s plan. We are not intending to do this in our facilities. However, I can’t guarantee that this will always be the case. The world and people change. It’s in our nature.” *Honi soit qui mal y pense.*

At this point one would usually raise the question of ultimate, concrete proof—the “smoking gun”. But there is no concrete proof, at least not

yet. Nevertheless, in light of past developments and given the experience with comparable cases, one can dare to conclude that Brazil is most probably developing nuclear weapons. Moreover, it does not need a lot of time to do this. Experts at Los Alamos have concluded that in view of its previous nuclear activities Brazil is in a position to produce nuclear weapons within three years. This does not bode well either for Latin America, where there is a danger of creating a nuclear domino effect, or for the rest of the world, which would have to surrender yet another illusion.

If Brazil does acquire a nuclear military capability, it will bring an end to the vision of a world free of nuclear weapons expressed so pointedly in Prague by Barack Obama. This prospect is hardly surprising, at least not for the adherents of political realism. The “vision thing” is tricky. Former German chancellor Helmut Schmidt once said that anyone who had visions should see a doctor. And Gen. James Jones, Obama’s national security advisor, is fond of saying that “a vision without resources is a hallucination.”



HANS RÜHLE is the former director of the planning staff in the German Ministry of Defense.