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Brazil's Nuclear Policy
From Technological Dependence to Civil Nuclear Power

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Abstract

Since March 2006 Brazil has been the ninth country to control the full nuclear fuel cycle. While the U.S. government bashes the uranium enrichment activities in Iran, it has come to an arrangement with the uranium enrichment in its backyard after transitional diplomatic tensions. As signer of the Non-Proliferation Treaty Brazil has the right to enrich uranium for peaceful use. This article focuses on the political motives and objectives connected with the domination of this key technology. Brasilia has been striving for regional leadership and participation in international decision making processes. In historical perspective the Brazilian enrichment procedure marks the liberation from the technological U.S. dependence. Brazil seems to be on the way to establish itself as a civil nuclear power in international relations.

Key Words: Brazil, nuclear policy, uranium enrichment, Non-Proliferation Treaty, U.S. foreign policy

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Zusammenfassung

Brasiliens Nuklearpolitik. Von der technologischen Dependenz zur zivilen Atommacht

Brasilien beherrscht seit Anfang Mai 2006 als neuntes Land der Welt den vollständigen Brennstoffkreislauf. Während die US-Regierung die Urananreicherungsaktivitäten im Iran scharf verurteilt, hat sie sich nach vorübergehenden diplomatischen Spannungen mit mit der Urananreicherung in ihrem geostrategischen „Hinterhof" arrangiert. Als Signatarstaat des Atomwaffensperrvertrags hat Brasilien das Recht, zur zivilen Nutzung Uran anzureichern. Dennoch stellt sich die Frage nach den politischen Zielen und Motiven, die mit der Beherrschung dieser Schlüsseltechnologie verbunden sind. Neben energiepolitischen Motiven bemüht sich Brasilia seit langem darum, sein Profil als regionale Führungsmacht zu schärfen. Vor dem Hintergrund der jüngsten Entwicklungen der globalen Nuklearpolitik ist Brasilien auf dem Weg, sich als zivile Nuklearmacht zu etablieren.

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4. Brazil's Nuclear Policy under President da Silva: A Strategic Conflict with the U.S.?
5. Prospects of Brazil's Role in Global Nuclear Policy
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1. Introduction

When Brazil puts the uranium enrichment plant *Resende II* into operation shortly, it will be the ninth country of the world to control the full nuclear fuel cycle. The government of President Lula da Silva refuses the inspectors of the International Atomic Energy Agency (IAEA) the inspection of the ultracentrifuge, which represents the heart of the plant. This way Brasilia wants to protect its innovative technology from industrial spying. While the U.S. government bashes the uranium enrichment activities in Iran, it has come to an arrangement concerning the uranium enrichment in its geostrategic backyard after temporary diplomatic tensions with the Brazilian regional leader.

As a signer of the *Non-Proliferation Treaty* (NPT), Brazil has the right for peaceful use of nuclear energy. At the same time the members of the regime are obliged to allow the IAEA-inspectors the control of their plants. Uranium enrichment plants in particular may be used for civil as well as military purposes (*dual use*-technology) and are therefore considered to be a milestone on the way towards being a nuclear power. Consequently, at the verification

conference of the NPT in May 2005, the previous nuclear weapon states – especially the U.S. – tried to restrict the sensitive enrichment and recycling technologies to the present technology owners. Just like the other non-nuclear weapon states, Brazil was not willing to give up the right for uranium enrichment, but makes use of it instead now. Against this background, the present article will deal with the following questions: What are the goals and issues of the current Brazilian nuclear policy? How does it fit into the international non-proliferation regime? What influence does it bear on the bilateral relations with the U.S. as determining actor of global nuclear policy?

From a historic perspective, the Brazilian enrichment procedure marks the liberation from the technological dependence from the United States that Brazil has seen itself caught in since the end of World War II. Through a long period, Brazil had been waiting in vain for Washington's atomic know-how. Neither the offer of exports of crude uranium to the U.S. nor changes of foreign policy by Brazilian governments led to the hoped-for transfer of technology. Numerous doctrines of the Brazilian foreign policy had been connected with rapprochements with Washington: From the *Operação Panamericana* under President Kubitschek at the end of the 1950s over the *Automatic Alliance* with the USA under General Castelo Branco in the 1960s up to the *Projeto Brasil Potência* under General Garrastazu Médici at the beginning of the 1970s.

Subsequently, the Brazilian military governments – the striving for nuclear weapons which became more and more obvious in the context of the Argentine-Brazilian rivalry – tried to get new cooperation partners. When the Federal Republic of Germany agreed to do business with the authoritarian government of Ernesto Geisel it was again the White House that vetoed the planned transfer of technology. Only when re-democratized Brazil was integrating itself into the net of international nuclear control regimes during the 1990s, the relations with the U.S. improved increasingly.

On the one hand, a trusting cooperation between Washington and Brasilia has resulted, which is in the meantime also marked by the acceptance of the Brazilian claim to regional leadership. On the other hand, the U.S. government's nuclear and security policy does currently not focus on Latin America. The escalation of the conflict of the international community with the Iranian regime moves Brazil's nuclear policy into the background as well as the latest nuclear cooperation agreement between the U.S. and India. The cooperation with the non-signer of the NPT marks a U-turn of Washington's foreign policy after all. Only Brasilia's intention to cooperate with opponents of Washington allows the nuclear ambitions of the Amazon state to come to the fore again. The government da Silva discusses cooperation possibilities concerning civil utilization of atomic energy with the Chavist Venezuela as well as China, the ascending global rival of the United States. President Chávez, whom U.S. Sec-

retary of State Rice describes as a "negative factor in the hemisphere" and who does not try to hide his good relations with the OPEC-partner Iran, would like to integrate Teheran into the nuclear cooperation with Brasilia.

It is questionable how Brazil will position itself on the far field of the global nuclear policy in the future: Is the striving for nuclear weapons and the opting out of the NPT, following the Indian example, a realistic option for the Brazilian government? Alternatively, will the aspirant to a permanent seat in the U.N. Security Council confine itself to the civil use of nuclear energy in order to overcome its chronic scarcity of energy? Both options would lead to the preference for different partners in the nuclear cooperation. From the U.S. foreign policy's point of view the question raises, how the good relation with the regional leader Brazil can be maintained on the one hand and how the global proliferation risk can be kept small on the other hand. Furthermore, the government of President Bush has to be concerned with not losing entirely its credibility and authority as global nuclear leader despite the different dealing with the nuclear ambitions of Brazil, India and Iran.

2. The Non-Proliferation Treaty and its Basic Problems

The NPT was concluded on 1 July 1968 on the initiative of the USA, the Soviet Union and Great Britain and became effective in 1970, after it had been ratified by 147 states. To date 188 countries have signed the treaty. It is meant to prevent the proliferation of nuclear weapons and to enable also non-atomic-powers to peaceful use. The treaty defines proliferation as production or acquisition of nuclear explosive charges by all the states that have not tested nuclear weapons before 1 January 1967 – therefore all the states except for the USA, the Soviet Union (respectively Russia), France, China and Great Britain, which count by it as official nuclear powers. According to the treaty, the transfer of nuclear weapons or other nuclear explosive devices to any recipient is prohibited (article I). The remaining 183 countries, amongst them Brazil, that have joined the NPT as non-nuclear weapon states must not change their status of non-nuclear weapon states according to article II of the NPT. By article VI of the NPT all parties are obliged to a general and complete nuclear disarmament. In practise this applies to the nuclear powers.

Besides the official nuclear powers the non-members of the NPT Israel, India and Pakistan are considered unofficial nuclear powers. In 2003 North Korea terminated the NPT and declared the possession of nuclear weapons in November 2003. Iran signed the NPT, but dodges it in many ways. After the IAEA had issued an ultimatum to Iran, even this state signed the Additional Protocol to the NPT in December 2003. This protocol had been de-

cided on due to the experiences with the arms plans of Iraq after the Gulf War in 1991. It offers more effective controllability such as unannounced and almost unrestricted control of the nuclear plants (see Hooper 1999). Brazil refuses the signature of the Additional Protocol to the NPT until today.

The NPT and its Additional Protocol make the nuclear-technological progress of the emerging and developing countries more difficult even in the sector of civil research and use. After all, "paradoxically it has the effect of disarming the unarmed", as the former Argentine U.N. Ambassador José María Ruda notices quite accurately (quoted in La Nación, 18 April 2004). Particularly regarding those states with a developing nuclear industry on the one side and not belonging to any military alliance (Argentina, Brazil) – especially during the Cold War – on the other side, the NPT did not provide favourable starting points for the scientific-technological process in the nuclear sector. The technological dependence Brazil considers itself to be caught in seems to be the price for the prevention of the potential abuse of nuclear technology, since passing on nuclear technology to irresponsible states and other actors is a precondition of its abuse.

The international regimes for the control of means of nuclear mass destruction have not turned out to be very effective. This is particularly shown by the nuclear bomb tests firstly by India and shortly after by Pakistan, the presentation of the North Korean long-range missile as well as the discovery of a parallel nuclear project in Iran. Especially those states that have not signed respectively cancelled the NPT, but are demonstrably in the possession of nuclear weapons (Israel, India, Pakistan and North Korea) undermine the NPT considerably. In order to reduce the proliferation risk and to reinforce the NPT these states would also have to be included in the non-proliferation regime. However, not demanding a membership as non-nuclear weapon country from them without compromising the central terms of the contract at the same time is similar to the squaring of the circle (Müller 2005: 3). The mentioned states are little willing to negotiate because their nuclear weapons give them leverage in foreign policy and keep hostile states at a distance. Jonathan Shell (see 2000) also comes to this conclusion. In his *Foreign Affairs*-article "The Folly of Arms Control" he describes the proliferation as a kind of stepchild of the deterrence logic of the Cold War, which militarily inferior states use in order to protect themselves against (preventive) efforts for intervention by more powerful actors.

The failing of the seventh verification conference of the NPT in May 2005 in New York is characteristic of the crisis of the regulation of the non-proliferation of nuclear weapons according to international law. Contrasting interests of the nuclear weapon and non-nuclear weapon states were the reason for this. At first the U.S. government (tacitly supported by France) refused to accept the hard fought for compromise of the verification conference from

2000 with its disarmament program of the "13 steps". As a result of this attitude the non-nuclear weapon states rejected any strengthening of the non-proliferation aspects of the regime like verification, export controls, conviction of violators of the contract and institutional reform (Müller 2005: 2). Another area of conflict that became obvious during the conference refers to the right of all parties of the treaty for the unhindered peaceful use of the nuclear energy guaranteed in article IV of the NPT. So the non-nuclear weapon states must have understood U.S. President Bush's request for restricting even the civil operation of enrichment and recycling to the present technology-owners and to achieve this by strict transfer refusal if necessary as a frontal attack to their rights from article IV. In contrast to President Bush, a group of experts of the IAEA examining options for internationalising the sensitive dual-use-technology (including a system for the guarantee of fuel deliveries) came to the result that a step of this kind is only possible at present if it is done voluntarily. An amendment of the NPT to the debit of the non-nuclear weapon countries were only thinkable in connection with considerable disarmament contributions of the nuclear weapon states and only if the new rule applies to all without exception (IAEA 2005, quoted in Müller 2005: 5). The U.S. delegation regarded this balancing of interests as unacceptable again. Finally the conference failed and the non-nuclear weapon states continued to insist on their right to enrich nuclear fuel for civil use. One year later Brazil, who was holding the presidency of the New York conference and therefore playing a neutral role, made use of this right.

3. Brazil's Nuclear Policy in Historical Perspective

Bilateral Relations after World War II: Brazil's Futile Waiting for U.S. Nuclear Know-how

In the 1940s the topic of the Brazilian nuclear policy was addressed by the agenda of the bilateral relations between the USA and Brazil for the first time. After great sources of uranium had been discovered in Brazil one decade earlier, President Getúlio Vargas concluded an agreement on common uranium exploitation with the USA. Three subsequent agreements were intended: Brazil should be compensated for its uranium supplies by nuclear technology from Washington. In 1946 the USA submitted the proposal to the International Atomic Energy Agency (IAEA) of the U.N. for the founding of an international board for the control of the worldwide sources of uranium (Plan Baruch).[1] Brazil and the Soviet Union were the only countries to refuse the U.S. initiative. The Brazilian representative Álvaro Al-

[1] For Plan Baruch see: www.nuclearfiles.org/redocuments/1946/460614-baruch.html, 4 October 2004.

berto da Mota e Silva suggested the principle of specific compensations instead, which should have allowed Brazil the further construction of nuclear reactors on its territory in return for natural uranium supplies.

In order to prevent the unregulated uranium exportation in 1951 the National Research Council (*Conselho Nacional de Pesquisas* – CNPq) was founded in Rio de Janeiro. In February 1952 the two governments concluded an agreement on the sale of Brazilian uranium. However, the U.S. refused its trading partner "specific compensations" and the transfer of technology for the development of the Brazilian atomic energy sector failed to happen again (ComCiência 2004: 9).

When it became public that German technology was delivered to Brazil for the construction of three uranium enrichment centrifuges in 1954, the South American country's intentions of acquiring nuclear technology became evident again. It has been an open secret that the nuclear technology was also intended to be for military use (Schirm 1994: 194). However, the import of the German ultra-centrifuge-method failed due to the U.S. occupying power, which prohibited the transport of the centrifuges to South America.

Vice-President João Café Filho's (1954-1956) assumption of the state affairs led only to short-time stabilization of the relations with Washington, which Brazil criticised for being one-sided. During his short rule Café Filho concluded several agreements on the cooperation with the United States in the civil use of nuclear power. In 1955 the broad bilateral cooperation in the nuclear sector was agreed once again: The *Cooperation Treaty for the Peaceful Development of Atomic Energy* planned that Brazil should get up to six kilogram enriched uranium (20%) for the production of energy in reactors hired from the U.S. within a period of five years. A *Common Program for the Research and Estimation of the Uranium Sources* in Brazil was to investigate the Brazilian reserves of uranium, which again were to be sold to the USA. At the same time the two states concluded a second *Cooperation Agreement on the Research of the Brazilian Uranium Sources* that intended the removal of research reactors as well as the establishment of committees for information exchange. The representatives of the U.S. added clauses to the agreements which implied a restrictive use of the research results. Consequently this agreement did not lead to a transfer of knowledge to Brazil either.

Juscelino Kubitschek (1956-1961) launched the so-called Pan-American Operation (*Operação Pan-Americana* – OPA), which was meant to intensify the general bilateral cooperation between Brazil and the USA and aimed besides an economic collaboration also at a political one. The longer the aligned confrontation continued the less attention the USA paid to Brazil. In the end Kubitschek cancelled the common program for the research of the Brazilian uranium sources. He justified this step by lacking advantages for Brazil, since the U.S. government had not agreed to the know-how transfer for the nuclear cycle. In 1956 the IAEA,

based in Vienna, as well as the National Nuclear Energy Commission (*Comissão Nacional de Energia Nuclear* – CNEN) was founded. At the same time the latter was also assigned to function as a national board of control (licensing, reactor safety) and to coordinate the sector of nuclear research and development. Besides civil use, the development of the military nuclear capabilities was the prime objective (Heinz 2001: 251), even though this is partially denied in Brazil (Wrobel 1996: 339). Despite all discrepancies, in July 1957 the first two research reactors resulting from U.S.-Brazilian cooperation were opened.

Accordingly, the independent foreign policy of the Goulart government (1961-1964) put a considerable strain on the relations with the USA. Various U.S. institutions such as the *Council of the Americas* led by David Rockefeller and the U.S. Ambassador Lincoln Gordon contacted the Brazilian opposition and contributed to the destabilization of the democratically elected government. The United States had neither planned the putsch against Goulart nor had Washington directly intervened in the incidents in March/April 1964 (ibid: 55). However, the USA sympathised with the new military rulers and were the first American country to accept them. The Brazilian regime under Humberto Castelo Branco (1964-1967) assumed the rhetoric of the Cold War during the period of the *Automatic Alliance* with the U.S. and pursued an austere finance policy (Soares de Lima 2000: 68).

During the rule of Costa e Silva (1967-1969) Brazil dissociated itself once again from the special relationship with the U.S. and strived for more foreign policy independence. Brazil signed the Treaty from Tlatelolco (*Tratado para la Proscripción de las Armas Nucleares en la América Latina y el Caribe – Acordo de Tlatelolco*)[2], which intended a nuclear-free-zone in Latin America, and the Caribbean while the states committed themselves not to profit militarily from the nuclear technology. Brazil ratified the Tlatelolco-Treaty only in 1994. In 1968 Brazil also signed the NPT, but refused the ratification of the document until 1998. Brazil's long lasting attitude of refusal in this matter was due to the discriminating quality of the treaty as confirmed by the militaries as well as the *Itamaraty*. The Brazilian government feared that the treaty might form a structural obstacle for the further development of the comparatively underdeveloped nuclear technology of the country. Especially the governmental actors opposed the institutionalisation of the unequally distributed power within the international system, which was intended by the nuclear powers and consolidated by the NPT. The control regime was considered to be a "neo-colonial" instrument with clearly disadvantageous traits for the emerging and developing countries (Soares de Lima 2000: 72).

The Brazilian government renewed the diversification of the international partners during the period called *Policentrism*. Its own need for development was given special emphasis

[2] The complete text of the treaty is to be found under www.opanal.org/opanal/Tlatelolco/Tlatelolco-e.htm, 4 October 2004.

and meant to displace the shadow of the bipolar distribution of the world (Schirm 2001: 354). At international forums Brazil supported the concerns of the developing countries again. In 1968 the Brazilian Azevedo da Silveira was elected President of the *Group of the 77* (Soares de Lima 2000: 68). The *Policentrism* lasted only two years. Under General Garrastazu Médici (1969-1974) and his *Projeto Brasil Potência* it was done without linking with the developing countries and Latin America. Not the international system as a whole was intended to be changed, but merely one's own position within it.

Based on the first success with the research reactors, Brazil licensed the U.S. company *Westinghouse*, a subsidiary of *General Electric*, with the construction of the nuclear power station *Angra 1* in Angra dos Reis (Federal State Rio de Janeiro) in 1972. The control of the peaceful use was delegated to the U.S. Atomic Energy Committee. The details of the contract were vaguely defined and Brazil did not manage to free itself from the technological dependence from the U.S. (ComCiência 2004: 5). The head of the Military Cabinet and the Secretary of the National Security Council, General Abreu, commented on it:

> "The North Americans have not only withheld the technical details from us, even worse, they have supplied us with a sealed black box without saying what it contains. We can only operate the nuclear power plant, nothing else" (Abreu Dallari 1979: 43; quoted in Heinz 2001: 251).

The military government pressed for its own technological success and was under enormous pressure due to national energy shortages and Argentine achievements in the field of nuclear technology (meanwhile the first Argentine nuclear power plant *Atucha 1* had been put into operation.). The rise of Japan and oil-rich countries, the opening of the Brazilian economy for the international markets and a high economic growth between 1964 and 1974 led the military government to assume that Brazil was to become a world power within a very short period of time. This also led to the Brazilian claim to be at eye level with the USA for the first time. At least on the rhetoric level Washington accepted Brazil's regional claim to leadership (Schirm 2001: 354). The *Retrenchment-Doctrine* of the Nixon-Kissinger administration (1969-1974) regarded Brazil as a developing power centre and a key country for the region, which was meant to relieve the USA politically (*burden sharing*) in South America and to carry out part of the regional power. Two factors promoted the new role allocation to Brazil in particular: On the one hand the more friendly relations between the U.S. and the Soviet Union led to ceasing effects of the Cold War in Latin America. On the other hand the Vietnam War (1964-1975) absorbed increasingly more attention and resources from Washington.

Nuclear Policy of the Generals: Diversification of Cooperation Partners for the Development of Civil and Military Nuclear Technology

The oil crisis in 1973/1974 increased the necessity of alternative energy production. The drastically raised oil prices jeopardised the Brazilian economic growth. The foreign policy of Ernesto Geisel (1974-1979) that had lost its ideologies and was still devoted to the development of the country was called *responsible pragmatism*. Ernesto Geisel, the former head of the public oil company *Petrobrás*, created the *Empresas Nucleares Brasileiras S.A.* (*Nuclebrás*) in order to expand the national nuclear programme. After Washington had shown decreasing willingness for a transfer of the complete nuclear cycle and demanded the ratification of the NPT as condition for the future technology transfer and finally jeopardised the uranium supplies for the existing reactor, the Brazilian generals started looking for alternative partners.

By the Federal Republic of Germany Brazil found a new partner in possession of the desired technology. After secret negotiations the Brazilian and the German Foreign Minister signed the *Agreement on Cooperation in Peaceful Utilization of Nuclear Energy* on 27 July 1975. By the year 2000 eight nuclear power plants were planned to be built in Brazil with German know-how. So far only one nuclear power plant, *Angra II*, has been constructed.

Financing problems in Brazil and public pressure in Germany where the anti-nuclear power movement and human rights groups turned against the know-how transfer to military regimes made business more difficult. Above all, Germany had ratified the Non-Proliferation Treaty in contrast to Brazil. Also Washington criticised the nuclear-deal directly. The Ford (1974-1976) and Carter administrations (1977-1980) tried to put the government in Bonn off the trade and threatened it with sanctions (Moniz Bandeira 1994: 219).

Finally the German parliament imposed a moratorium in order to postpone for four years further German-Brazilian plans . In March 1977 Washington finally succeeded in preventing the official Brazilian-German nuclear cooperation. Since the Netherlands and Great Britain had been involved in the German uranium enrichment technology through the *Uranium Enrichment Company* (URENCO) and spoken against the trade with Brazil, the agreement was thwarted in the end. Altogether the mentioned problems led to a considerable delay. As a result the test phase at *Angra II* could only be assumed in 2000.

The main reason for Washington's negative attitude towards a technology transfer was Brazil's intention of passing atomic know-how and exporting nuclear power plants to other developing countries (Schirm 1994: 195). On the one side the U.S. government feared the destabilization of the international system and a reduction of its global dominance. On the other side well developed commercial interests came into play, since the U.S. delivered 90% of the reactors traded on the world market at the end of the 1970s (Luis Bitencourt, interview

26 June 2004). So the centre of Washington's strategic interest was the insistence on the ratification of the NPT by Brazil and other developing countries with the ultimate aim of perpetuating the balances of nuclear power.

Recent publications point out that already the Geisel administration had not agreed to confine itself to the peaceful use of nuclear energy. Gaspari (2004: 129) quotes statements by General Hugo Abreu during the first conference of the Armed Forces Joint Command under the Geisel administration on 10 June 1974. Abreu had not only intended the production of electric energy:

> "We have got to look at the strategic and political advantages of each single country that has got the capability to cause a nuclear detonation. This applies especially to those states interested in restoring their prestige within the international relations."

Within the familiar circle of his generals, President Geisel also explained that in view of the Argentine progresses in the nuclear research one had to intensify one's own efforts:

> "So we try to develop a technology, which allows us to produce those nuclear weapons that the others [Argentina] possess already. […] If we develop our technology efficiently further, we will reach this aim easily" (ibid: 132, see also O Estado de São Paulo, 17 August 2004).

At the end of the 1970s the Geisel administration initiated a parallel nuclear program, which planned the control of the enrichment technology beyond the supervision and safeguarding clause by the IAEA (Moniz Bandeira 1994: 236f., Heinz 2001: 253). Additionally the company *Siemens* participated in the secret program (Moniz Bandeira 1994: 227f.). At first, the so called parallel program was carried out commonly by the Army, the Air force, the Navy and the Institute for Energy and Nuclear Research (*Instituto de Pesquisas Energéticas e Nucleares* – IPEN) of the University of São Paulo. The federal government in Brasilia financed it. Later on, the Navy was assigned to the sole responsibility for the nuclear research program.

Wöhlcke (1987: 124) identifies five motives of the Brazilian Armed Forces for the striving for nuclear weapons: (1) a demonstration of power directed to the civil society; (2) a symbolic demonstration of independence with regard to the hegemonic policy of the USA; (3) the emphasis of the regional claim to leadership; (4) the upgrading of the status within the international system to an important Third World-power; (5) the reaction to Argentina's atomic bomb program that was probably being developed.

Again the U.S. reacted with disapproving astonishment to the efforts for nuclear power in its backyard. Moreover, President Carter criticised the state of the human rights and the "case of Brazil" was put on the foreign policy agenda. On the whole the divergences in human rights, non-proliferation and nuclear policy led to the further cooling of the relations between Washington and Brasilia (Soares de Lima 2000: 74). In the end the U.S. imposed

economic sanctions against Brazil, prevented World Bank credits and loans from private banks connected with them, since they could also be used for the military nuclear program.

Nuclear Policy of the *New Republic*: Rapprochement with the U.S. and Integration into the Network of International Control Regimes

In the middle of the 1980s the bilateral relations reached their low. At first, the Brazilian arms exports to Libya and Iran were discussed and strongly criticised by Washington. In 1986 Brazil resumed its diplomatic relations with Cuba. The moratorium on foreign debt and Brasilia's refusal to ratify the NPT let the U.S. Congress put Brazil on the list of the states that were not to be dealt with in any forms of military or technological cooperation. Making matters worse the Brazilian President José Sarney (1985-1989) announced in September 1986 that Brazil was in possession of the uranium enrichment technology. Two years later he confirmed to continue the construction of nuclear power plants. Nuclear physicists already forecasted the completion of the first atomic bomb "within the next years" (Neue Zürcher Zeitung, 11 November 1989). The new constitution from 1988 laid formally down peaceful aims of the nuclear research and assigned the control of it to the Brazilian Congress (article 21 of the Federal Constitution).

President Collor de Melo tried to release the relationship with the USA and to develop it further during his short rule (1990-1992). The military nuclear program was "discovered" and dropped to populist success. For this purpose Collor let the test shaft in the *Serra do Cachimbo* (Federal State Pará) be filled up and sealed with cement in front of running cameras in November 1990. The shaft had been dug in 1981, but it was pretended that it had only recently been localised. In the same year Collor explained in front of the United Nations that Brazil would not even carry out nuclear tests for civilian purposes. However, behind the scenes Collor doubled the means for the secret funds of which 90% were allocated to the Secretariat for Strategic Affairs (SAE) in the budget suggestion for 1991. The remaining ten percent were given to consultants of the President and the Military Ministers (Moniz Bandeira 1994: 241). The SAE coordinated the military nuclear research, which was mainly pressed ahead with in the laboratories of the Navy (Luis Bitencourt, interview on 26 June 2004).

The positive agenda of the bilateral relations with the U.S. produced by President Collor de Melo was threatened by the first Gulf War in the end (Schirm 1994: 191). Since the Iran-Iraq-War Brazil had become the most important arms supplier for Baghdad. After the Iraqi-invasion in Kuwait in 1990 Washington criticised the cooperation between Brasilia and Baghdad in the missile and nuclear sector. Collor relented and made far-reaching concessions in order not to jeopardise the economic advantages expected from the cooperation with Washington. Therefore the USA kept to the confiscation of Brazilian weapon compo-

nents that were in the USA for further processing. Collor cleverly disguised his careful change of the nuclear and arms policy by officially dropping his own military nuclear program, reducing arms deliveries in conflict regions and announcing the tightening up of the export guidelines for the transfer of sensitive technology (Clóvis Brigagão, interview on 7 May 2004).

Furthermore a far-reaching change within the nuclear and arms policy remained missing, which also would have been difficult to convey to the powerful Brazilian Armed Forces. In view of the virtually non-existent civil supremacy in Brazil concerning security matters at that time the question remains, whether the President possessed the necessary autonomy to drop the military nuclear program. As far as this goes, one has to agree with Schirm (1994: 198f.) who points out:

> "In order to win the influence on the nuclear activities in his own country, Collor would have had to withhold the control over the program from the military. However, he was either not willing or not able to do so. […] On the whole Brazil's concession was not of a profound character and the country could generally continue with its policy of reserved independence in the arms industry and nuclear bomb sector."

The fact that in April 1991 the Collor administration let the Foreign Minister Resek announce a closer cooperation with the USA in the sectors of arms trade and defence policy suggests the thesis of lacking civil supremacy in these areas. This step had to be revised soon due to severe protests by the generals and the Association of the Arms Industry (*Associação Brasileira das Indústrias de Materiais de Defesa* – ABIMDE) (ibid: 194).

In July 1991 the Brazilian government signed the agreement on the establishment of the Argentine-Brazilian control agency (*Agência Brasileiro Argentina de Contabilidade e Controle de Materiais Nucleares* – ABACC). The IAEA is its fourth treaty partner besides the two states and the ABACC. In addition to this, the Brazilian Senate gave way to the ratification of the Agreement from *Tlatelolco* in May 1994. This agreement had already been signed at the end of the1960s and planned a nuclear-free zone in Latin America and the Caribbean. In view of the regional development, the progressive democratisation of Brazil and not at least due to the world political turn after 1990 the USA revoked their restrictions on arms exports and the sale of high-technology opposite Brazil in August 1995.

In June 1997 even Brazil ratified the Non-Proliferation Treaty in the end and in doing so fulfilled the priority security policy request by the USA. One year later Brasilia ratified the nuclear *Comprehensive Test Ban Treaty* (CTBT), too. This completed the embedding of the rising regional power in the net of international control agreements and declarations of intent in the nuclear sector.

The ratification of the NPT is based on a pragmatic decision by Fernando Henrique Cardoso. After all by the *Tlatelolco*-Treaty and especially by the ABACC Brazil had already met all control commitments the NPT implied – including the *full-scope safeguards* of the IAEA. In order to maintain the chances of a permanent seat in the U.N. Security Council and to position itself as a *global actor*, it was important to ratify the NPT – already ratified by 148 states – and to consolidate the profile of a responsible actor in the international relations by this. Nevertheless, the former dependence theorist Cardoso did not move away from considering the NPT to be a discriminating instrument. The Brazilian government was far more concerned with improving the possibilities for Brazil's participation within the international system. Accordingly, Brazil and the USA were further moving towards an agreement on nuclear and arms policy issues during the two Cardoso terms (1995-2002). In the 1990s the two governments signed bilateral agreements on the usage of the Brazilian missile base in Alcântara by the USA: One space-agreement and one agreement on the common peaceful utilization of nuclear energy.

4. Brazil's Nuclear Policy under President da Silva: A Strategic Conflict with the U.S.?

Latest Controversies: IAEA-Inspections in *Resende II* and Alarming U.S. Media Reports

In October 2003 the Brazilian Minister for Science and Technology Roberto Amaral announced that Brazil would have had achieved the capability to enrich uranium by means of the ultra-centrifuge-procedure[3] within the year 2004. Ten years later, Brazil could start to export the enriched uranium, the Minister continued. It is true that Amaral named the energy supply of the country as the main objective of the Brazilian nuclear program, but the parting Minister also remarked that Brazil should, at least, not fundamentally exclude the development of the capability to build an atomic bomb (see Roul 2004 as well as O Estado de São Paulo, 7 October 2003). By this advice Amaral left his successor Eduardo Campo and the da Silva administration with a weighty legacy.

[3] According to official information, only six states worldwide possess the ultra-centrifuge-procedure at the moment: Russia, China and Japan as well as the European syndicate Urenco, in which Germany, the United Kingdom and the Netherlands are involved. In France and in the USA the natural uranium is enriched by the gas-diffusion-procedure, which is by now rated as comparatively outdated and cost-intensive. It has so far not entirely been clarified which enrichment-procedure Israel, India, Pakistan, North Korea as well as – if applicable – Iran and Libya rely on. The IAEA reproaches the Pakistani nuclear scientist Abdul Qadir Khan with acquiring the ultra-centrifuge-technology of the Urenco by industrial espionage in Europe and passing it on to Iran, Lybia and North Korea afterwards.

Since December 2003 several reports have been presented in the U.S. media, which criticised the Brazilian government's lack of willingness to cooperate in inspections of the International Atomic Energy Agency. First, in December 2003 the *International Herald Tribune* published an article by the former U.S. chief-negotiator of the IAEA, James Goodby, with the telling title "Brazil gives the U.S. nuclear headache"[4]. Goodby mentions Brazil together with North Korea and Iran. At the same time he points out that all these cases have to be treated the same way:

> "If we do not want to have any enriched uranium in North Korea and Iran, then we do not want to have any of it in Brazil either."

In April 2004 the *Washington Post* reported under the headline "Brazil Shielding Uranium Facility"[5] that Brazil denied U.N. inspectors access to the uranium enrichment plant *Resende II* in the Federal State Rio de Janeiro. In both press reports campaign-statements of the Brazilian presidential candidate da Silva on the discriminating effect of the NPT are mixed with rumours, according to which the current President is said to have called the ratification of the NPT a mistake. Furthermore, the quoted reports create a direct link between these alleged statements by da Silva and the Brazilian government's aversion to sign the Additional Protocol to the NPT. This connection cannot be found in statements of Brazilian government actors. Finally the U.S. journal *Science* (see 22 October 2004) published an article, in which the authors Liz Palmer and Gary Milhollin suggest that the nuclear program at the Brazilian enrichment plant *Resende II* aims at the immediate construction of up to six atomic bombs. The Latin America commissioner of President Bush, Roger Noriega, expressed himself more diplomatically, but equally firm:

> "The subject is very difficult, but I believe that our government has got great confidence in Brazil. We have no doubts about the intentions of Brazil […]. Nevertheless, we ask Brazil to continue meeting its responsibility in the non-proliferation of nuclear materials and to show this by signing the Additional Protocol of the NPT" (see AFP, 14 April 2004).

Demonstrations of trust sound undoubtedly different. A Brazilian uranium enrichment ultra-centrifuge, which is planned to be ready to work in 2006 and the technical details of which the inspectors of the IAEA show interest in, are the reasons for this. During an inspection in February/March 2003 the state-owned INB, which is running *Resende II*, denied the U.N. inspectors full access to the centrifuges. The uranium enrichment plant in Resende – currently still under construction – is planned to supply the nuclear power plants *Angra I*,

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[4] International Herald Tribune, on 31 December 2003, under www.iht.com/articles/123243.html, 10 October 2004.

[5] Washington Post from 4 April 2004, under www.washingtonpost.com/ac2/wp-dyn?pagename=article&contentId=A48456-2004Apr3&notFound=true, 7 October 2004.

Angra II and soon even *Angra III* with low enriched uranium (3.5 up to 4%). According to the information of the Brazilian government, the ultra-centrifuges used for this have been built with their own innovative technology which makes the uranium enrichment by far more cost saving than it has so far been the case with the enrichment-procedures in other countries.

The research and development expenses for the Brazilian ultra-centrifuge-technology sum up already one billion U.S. dollars (Manuel Montenegro, interview on 18 May 2004). According to the Brazilian government it is only about protecting the centrifuge technology and the national commercial interests connected with it. The ultracentrifuge has a visual cover so that the U.N. inspectors cannot see its detailed construction. From Brasilia's point of view this does not impede a more effective control by the IAEA and ABACC. The single steps for the realization of the signed agreement are practicable without detailed knowledge of the centrifuge.

The focus of the IAEA inspections is the control of the quantity of the produced uranium and its composition. Apart from these inspections the IAEA monitors the uranium enrichment plant of the INB with cameras. Future control modalities for *Resende II* have already been negotiated with the ABACC and are currently being discussed with the IAEA. From the negotiations in Vienna it has only become known that the negotiating parties agree that continuing controls cannot be forced on Brazil due to the existing treaties. The candidate for a permanent seat in the U.N. Security Council is far more concerned about its reputation within the international community (Manuel Montenegro, interview on 18 May 2004). So far Brasilia is not willing to sign the Additional Protocol to the NPT because extended safeguards would make the protection of the independently developed centrifuge technology even more difficult.

By the international treaties Brazil has committed itself not to exceed the enrichment degree of 20%[6]. The production of a nuclear explosive charge requires an enrichment degree of 90% at least. According to the information of the INB the uranium in *Resende II* can only be enriched up to 5%, which is sufficient for the production of electric energy in nuclear power plants. The nuclear reactor of a nuclear operated submarine needs an enrichment degree of up to 20%. The Brazilian Navy has been working on the development of a nuclear powered submarine over decades and forecasts its opening for 2015 respectively 2018. One concern of the IAEA might be that the ultra centrifuge in *Resende II* is technically capable of exceeding

[6] The IAEA defines uranium up to 20% enrichment as "low enriched uranium". For the production of nuclear energy the isotope U 235 is usually enriched up to 5%, while natural uranium consists only to 0,7% of the isotopes of the type U 235.

the allowed enrichment degree and possibly producing plutonium suitable for the production of weapons.

The mentioned ultracentrifuge has been developed at the research centres of the Brazilian Navy, especially at the *Centro Experimental Aramar* (Federal State São Paulo), which has devoted itself to the project of the nuclear powered submarine[7] since 1979. The head of the military nuclear research centre *Aramar*, Rear Admiral Alan Arthou, holds the view that the Brazilian centrifuge technology is technically superior to the U.S. and European procedures. The more efficient and cost-saving enrichment method is based on a magnetic pending procedure, by which there is no frictional resistance at the more than 1,000 rotations per second. Therefore the ultracentrifuge can do without water-cooling and works almost silently (Jandyr Ferreira dos Santos junior, interview on 18 May 2004). The innovative centrifuge procedure will enable Brazil to participate in the worldwide uranium trade as a competitive rival. In other words: The more efficient enrichment method will lead to selling prices that are lower than the current prices (Alan Arthou, interview on 21 November 2004).

On 5 April 2004 the Brazilian Foreign Ministry explained that the Brazilian nuclear program constitutionally served only peaceful purposes and has been following the provisions of ABACC and the IAEA since 1994 (see Ministério das Relações Exteriores 2004). At the same time the *Itamaraty* emphasised that Brazil meets the international disarmament and non-proliferation treaties such as the *Tlatelolco*-treaty, the NPT and the CTBT. By pointing to the compliance with all treaties the Brazilian Ministry of Foreign Affairs rejects any comparison with so-called *rogue states*. Being the biggest South American country, Brazil is furthermore member of the *Nuclear Suppliers Group* (NSG), a multinational institution for the containment of the proliferation of materials suitable for the development of nuclear weapons. The NSG consists of more than 50 member states in possession of nuclear technology to different degrees.

Brazilian Criticism of the U.S. Nuclear Policy: Missing Washington's Efforts for Nuclear Disarmament

In June 2004 the Brazilian ambassador in Washington, Roberto Abdenur, reassured once again that Brazil did not agree with the signing of the NPT-Additional Protocol, merely for the protection of industrial secrets, and did not pursue any military nuclear plans contrary to press reports. After that Abdenur took the offensive and pointed to the *Nuclear Posture*

[7] By now only the five official nuclear powers and permanent members of the Security Council – China, France, Great Britain, Russia and the USA – possess nuclear powered submarines.

Review[8] of the U.S. Pentagon, which violated the NPT by taking the employment of nuclear weapons into consideration. By article VI the NPT obliges the nuclear weapon states to complete disarmament of their military nuclear inventory. The disarmament conference in 1996 marked the last crucial step for the disarmament of the nuclear weapons inventory, respectively the restriction of militarily motivated nuclear research. The CTBT resulted from this conference. It was again the Brazilian ambassador Abdenur who commented the nuclear policy of his receiving country undiplomatically in October 2004:

> "[…] the nuclear weapon powers lose their moral authority by demanding more effective non-dissemination regimes, if they themselves make no progress in their nuclear disarmament and even start developing new atomic weapons" (see O Globo, 24 October 2004).

So far the U.S. Senate denies the ratification of the Test-Ban-Treaty and by this prevents the coming into force of the international agreement. Instead the Bush administration planned the development of new atomic weapons. To be precise: This is about so-called mini atomic bombs (*mini nukes*), which are intended to destroy targets that are deeply buried underground. This research program aims at creating a practical field for the use of nuclear weapons independent from nuclear deterrence. Furthermore it is planned to ensure that atomic bombs could be employed again for the first time since World War II. In December 2004 the U.S. Congress stopped this plan by deciding to cut the means for the R*obust Nuclear Earth Penetrator* for the budget year 2005. After the Senate had agreed to this, the Republican Chairman of the Budget Subcommittee for Energy Production, Dave Hobson, adopted the arguments of the 183 signatory countries of the NPT, which are not in the possession of nuclear weapons:

> "This is a very provocative and plainly aggressive policy, which undermines our moral authority. Especially if we demand at the same time that other nations should surrender nuclear weapons" (see Frankfurter Allgemeine Zeitung, 6 December 2004).

The official nuclear weapon states are mainly excluded from IAEA inspections. It is true that commercial enrichment plants are controlled – in the USA, for instance. At the same time the nuclear weapon states run (military) nuclear plants, which are not investigated by the U.N. inspectors. The tightening up of the IAEA-inspections as demanded by Washington and London in particular is completely unfounded: After the ratification of the NPT Brazil had enclosed a *side letter* with the treaty, by which Brazil reserves the right for the protection of its technology. In this interpretation of the NPT, which the IAEA accepted, Brasilia explicitly

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[8] This classified Pentagon-document was presented to the U.S. Senate in spring 2002. Amongst other things it potentially plans the offensive employment of nuclear weapons (*first strike use*) against the so-called Axis of Evil and against China and Russia. The *Nuclear Posture Review* had already been commissioned by the Clinton administration (see Los Angeles Times, 9 September 2002).

announced the installation of a visual cover for the ultracentrifuge (Alan Arthou, interview on 21 November 2004). The governments of the U.S. and Great Britain demand an amendment to the previously and commonly met agreement according to which the inspections have been carried out over the last ten years (at first on the basis of the ABACC, and since 1998 also on the basis of the NPT). A new basis relating to international law, which would legitimate extended investigations, implies the Additional Protocol to the NPT (see IAEA 1997 as well as Hooper 1999). However, the Brazilian government denies the signing of the treaty. In this protocol the IAEA-inspectorate's unrestricted access to each plant and place connected with nuclear activities is intended (*strengthened safeguards*).

Strategic Divergence of Interest: Securing Energy Resources and Uranium Trade

Brazil and the USA pursue their interests against a common nature-historical background: The foreseeable end of oil, gas and coal reserves. With 439 reactors in 31 states nuclear energy covers currently already 16 per cent of the worldwide energy production. In view of the increasing demand for electric energy that is to be expected the forecasts proceed from the assumption that the number of reactors will be multiplied by five over the next decades. At the same time the capacity of each reactor will be multiplied by four (Brigagão 2004: 2). Accordingly, the global trade with enriched uranium is already very profitable by now and moreover with a highly promising future. Only in 2005 almost 20 billion U.S. dollars have been earned on the worldwide (official) uranium-market (see O Globo, 20 March 2006). Especially the most populous countries of the world – which Brazil and the USA belong to – have got an increased interest in the securing of energy resources. Furthermore Brazil wants to join into the uranium trade medium-term and the USA intends to expand its participation in the billion-dollar-business (for commercial as well as strategic reasons). The basic condition for the profit-oriented participation in the international uranium trade is an economically efficient enrichment technology.

According to plans of the Brazilian government, about 60% of the enriched uranium required for the operation of the reactors *Angra I* and *Angra II* is intended to be produced at national production plants by 2010. From 2014 on, the export of enriched uranium is planned in addition to the supply of the not yet completed reactor *Angra III*[9] (see O Estado de São Paulo, 7 October 2003). At the moment Brazil, which has got the third-biggest uranium reserves[10] worldwide, transports the depleted uranium to Canada first and from there

[9] The current Minister of Science and Technology, Sergio Rezende, plans the construction of seven more nuclear reactors in Brazil for the next 15 years (see O Globo, 9 March 2006).

[10] According to statements of the INB, uranium sources have been found in Brazil in the quantity of more than 400,000 tons. At the same time only one quarter of the state territory has been tested for

to the enrichment plants of the European Urenco, from where it is delivered back to the Brazilian nuclear power plants. According to the information by the Minister for Science and Technology, Campos, Brasilia spends 12 million U.S. dollars annually on this complicated procedure for the enrichment of Brazilian uranium. This is another central reason why the government wants to enrich the uranium in Brazil (see Folha de São Paulo, 8 April 2004).

Apart from the economic advantages of the U.S. nuclear industry President Bush also speculates on the security policy advantages for the international community resulting from a limited number of state actors in the possession of militarily useful nuclear know-how. The U.S. President did not take the arguments of the Brazilian government (according to which the emerging and developing countries have to endure the technological dependence from the U.S. and other developed countries even in the context of their civil nuclear research) seriously into account, when he announced on 11 February 2004:

> "Countries that have so far not produced [enriched/high enriched] uranium should not be allowed to start doing so. Instead they could import nuclear fuel for an adequate price, provided these countries would accept rigorous controls by the IAEA" (quoted in Roul 2004: 2).

By rigorous IAEA-inspections President Bush has obviously referred to the signing of the Additional Protocol to the NPT. The Brazilian nuclear establishment reacted displeased and described the ideas of the U.S. President as unacceptable (ibid). According to the Director of the Brazilian centrifuge program, Admiral Arthou, the USA have already invested about three billion U.S. dollars in the development of a commercially competitive centrifuge technology – so far without success (Alan Arthou, interview on 21 November 2004). Should the U.S. actually be interested in the Brazilian centrifuge technology, it remains questionable, why the public INB does not follow the usual procedure for the protection of innovative technologies: The filing of an international patent.

According to unofficial statements on this a procedure of this kind is just as little protected against U.S. industrial espionage as the inspectors of the International Atomic Energy Agency have to act exclusively and at any time in accordance with the interests of the United Nations. Voices of the Foreign Ministries of the nuclear weapon states and the environment of the IAEA deliver – also *off the tape* – another explanation for Brasilia's isolating strategy. These speculations link the Brazilian ultracentrifuges with the illegal activities of the Pakistani nuclear scientist Abdul Qadir Khan. As early as in February 2004 Khan, the

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uranium-oxid supplies. The biggest uranium reserves have so far been localised in the Federal States Amazonas, Bahia, Ceará, Minas Gerais and Paraná (see Folha de São Paulo, 5 April 2004). 4.4 million tons is the estimated value of the natural uranium reserves worldwide. At the same time Kazakhstan (957,000 tons) and Australia (910,000 tons) have got the biggest uranium reserves and rank long before Brazil, South Africa, the USA and Canada.

"father of the Pakistani bomb", had admitted having illegally passed on nuclear know-how to Iran and Libya. The Pakistani had probably also been involved in the construction of the North Korean A-bomb program (see Der Spiegel, 7/2004 as well as 13/2004). Other speculations concern a former German Urenco collaborator, who is suspected of having delivered blueprints to Brasilia (see Science, 22 October 2004).

In October 2004 the Brazilian Foreign Minister Celso Amorim and the U.S. Secretary of State Colin Powell appeased the diplomatic tensions on nuclear policy by unanimously announcing that the inspections of the Brazilian nuclear plants were no longer an issue of the bilateral relations. According to Secretary Powell, Washington trusts that Brazil will find a satisfying solution together with he IAEA (see Powell 2004). A few months earlier Brasilia had agreed to take the supreme command of the U.N. stabilisation mission MINUSTAH in Haiti. By this the Brazilian government had followed Washington's wish of contributing to the political and economic costs for the stability of Latin America and thus to unburden the superpower. This is a possible reason for the U.S. government's change of policy marked by new trust in the da Silva administration (see Schaffer 2005). Not least due to the support from Washington Brasilia and the IAEA agreed on a confidential control regime for *Resende II* within a few months only. The agreement allows the IAEA-inspectors the control of the incoming and outgoing uranium (quantity and enrichment degree), but not the inspection of the ultracentrifuge, which is still equipped with a visual cover. So far, the IAEA has inspected the enrichment plant near Rio de Janeiro 32 times.

5. Prospects of Brazil's Role in Global Nuclear Policy

Since the beginning of 2006, the Brazilian nuclear policy has been given international attention again. Firstly, the complete starting of the uranium enrichment plant in *Resende II* coincides with the growing diplomatic conflict over the uranium enrichment in Iran. Secondly, Washington increasingly criticises Brazilian cooperation plans in the field of the civil use of nuclear energy with partners such as Venezuela and China. Thirdly, the U.S. government concluded a nuclear agreement with India in order to counterbalance the Brazilian cooperation partner China, although Delhi has not signed the NPT.

The Comparison with Iran

The simultaneousness of the enrichment activities of the NPT-signatory states Brazil and Iran calls for comparison especially in view of the different dealing with them by the international community. Titled "Brazil Going Nuclear" in the conservative news magazine *The*

New American, William Norman Grigg reminds of Brazil's secret military nuclear program that was stopped 15 years ago before he draws a real horror scenario:

> "The parallels between Brazil's nuclear ambitions and Iran's are numerous and striking. One critical strategic difference is found in the fact that if Marxist-led Brazil became a full-fledged member of the nuclear weapon club, its alliance with Beijing, its developing space program, and its proximity to the U.S. would make it a far greater potential threat than Iran could ever be" (see The New American, 26 February 2006).

In the less polemic article "Brazil poised to join the world's nuclear elite" it is emphasised that since its re-democratisation Brazil has presented itself as a responsible member of the world community, which is neither striving for nuclear weapons nor threatening any other state militarily. Furthermore, all nuclear plants of the Amazon states are under the control of the IAEA and ABACC (see Miami Herald, 12 February 2006). In view of the scarcity of energy in Brazil, which is relatively poor of fossil fuel compared with its population, the development of the nuclear power makes more sense than in the oil rich Iran. The authoritarian Iranian regime probably supports the Jihad terrorism, has threatened to destroy Israel and kept the enrichment technology acquired by the smuggling ring of the Pakistani Abdul Qadir Khan secret from the international community for 18 years. Even today, Teheran refuses the inspectors of the IAEA free admittance to the country's nuclear plants.

It is true that these differences between the Brazilian and the Iranian case also justify a different dealing by the U.S. government as well as the United Nations with the nuclear ambitions of the two states. Nevertheless, an observation of the IAEA-Director Muhammad El Baradei has to be considered generally:

> "As soon as states possess the civil enrichment technology and subsequently a great quantity of enriched uranium and plutonium, the step to military use is so small that the IAEA can hardly control it" (see Financial Times, 2 February 2005).

So far, at least two arguments should be taken into consideration before legitimising Brasilia to become the ninth country of the world to enrich uranium.

Firstly, a change of nuclear policy within the Brazilian elite against the background of a changing global security situation cannot be excluded medium-term. Especially the nuclear weapon arsenals of North Korea and Pakistan (soon maybe Iran and Libya) involve a risk for all non-nuclear-weapon-countries that is difficult to calculate. Moreover, the second U.S.-led Iraq-intervention and the simultaneous acceptance of the North Korean regime lead to the assumption that only nuclear deterrence can guarantee the territorial integrity in the end. The defence doctrine of the Brazilian Army is founded on a conflict hypothesis, which proceeds on the assumption of a U.S. military intervention in the Amazon region (see Flemes 2004a, Marques 2004). Particularly the Brazilian Armed Forces, who stand up for a de-

terrence policy by tradition and who influence security and defence policy even today (see Flemes 2004b), might promote the development of defensively aligned nuclear weapons.
Secondly, each additional military or civil nuclear power increases the proliferation risk. In contrast to Iran, Brazil is not suspected to support the transnational terrorism. There is a danger that Brasilia might pass its enrichment technology on to states intending its military utilization or passing on the expertise or the weapons-grade material to violent actors again.

Potential Brazilian Partners: China and Venezuela

In May 2005, the Venezuelan President Hugo Chávez announced the development of a Latin American nuclear program between Brazil, Argentina and Venezuela in his TV-program "Aló Presidente". Iran was intended to support it. The Brazilian government dissociated itself from the initiative after that (see O Estado de São Paulo, 23 May 2005). The government of President Chávez supported the Iranian OPEC-partner by voting in the U.N. General Assembly against a referral of the Iran case to the Security Council. On the occasion of Iran's Parliament speaker Gholam Ali Haddad-Adel`s visit to Venezuela in May 2006, Caracas and Teheran concluded an agreement on common raw material exploitation. Little is known about its content, though. According to unconfirmed reports from Venezuelan opposition circles, the agreement also includes the common uranium exploitation in the Amazon area for exports to Iran (see The Washington Times, 13 June 2005).
After Brasilia's frigid reaction to the cooperation initiative by the inclusion of Teheran the Venezuelan head of government suggested another initiative in October 2005. That time excluding Iran. The foreign policy consultant of the Brazilian President, Marco Aurélio Garcia, confirmed immediately that he did not see "any problems" with the cooperation between Brazil, Argentina and Venezuela concerning the civil use of nuclear energy (see O Estado de São Paulo, 15 October 2005). The U.S. Secretary of State, Condolezza Rice, describes President Chávez as a "negative factor in the hemisphere" (see Schaffer 2005). The U.S. is not interested in passing on nuclear knowledge to the Chavist Venezuela. Lately Washington has repeatedly vetoed against arms purchases advised by Caracas. After Israel and Spain were not allowed to deliver F-16 combat aircrafts equipped with U.S. technology to Venezuela, Brazil will deliver military aircrafts of the type AMX-Tucano. In view of U.S. criticism on the future nuclear cooperation between Brasilia and Caracas, President da Silva announced that Brazil's sovereignty would not be restricted only because other states represent divergent positions (see O Estado de São Paulo, 15 October 2005).
Since Brazil has committed itself in the NPT to not passing on its enrichment technology to a third party, the Director of the powerful National Nuclear Energy Commission (CNEN), Odair Gonçalves, considers the nuclear medicine to be the only field for cooperation with

Venezuela (see O Estado de São Paulo, 16 October 2005). Above all, it is questionable, though, what advantages Brazil expects from the nuclear cooperation with its South American neighbours. Venezuela has neither a nuclear program nor any experience in the production of nuclear energy. The Argentine program is far behind the Brazilian one. Compensation with other fossil fuels would be thinkable. After all, the newcomer in Mercosur Venezuela, being the country with the biggest gas reserves in Latin America and the fifth-biggest oil exporter of the world, also propels the regional energy policy cooperation[11]. Its main concern is the *Petrosur*-concept, which aims at supporting the cooperation of the South American state-owned oil companies and forming strategic alliances.

In view of the limited risk of a technology transfer from Brasilia to Caracas, the U.S. State Department could also rate the developing energy and nuclear policy cooperation between the South American states as positive. After all Venezuela, supervised by the Brazilian regional leader, is far more calculable than an axis Caracas-Teheran. The nuclear policy cooperation between Brazil and Argentina has so far been connected with mutual and international duties and controls (ABACC, IAEA) (see Paul 2000: 99ff.). If a productive cooperation in the civil use of nuclear energy could actually be realised in the trilateral context, the same standards would probably apply.

In contrast to the cooperation on the South American level, the mutual advantage of Brazilian – Chinese cooperation is obvious. China is keen on imports of Brazilian uranium in order to secure the supply of its growing nuclear sector. In return, Peking is expected to invest in the Brazilian nuclear program, which is financially weak. Furthermore, the half-state-owned Brazilian *Nuclep* is planned to participate in the construction of Chinese nuclear plants. The *Nuclep* has planned and built *Angra I* and *II*. If a deal of this kind will actually be put into practice, is highly questionable, though. So far, Brazilian laws prohibit the export of crude uranium, which is defined as a strategic resource. An amendment of law is thinkable, but the Congress would have to confirm it. The CNEN is instructed to produce a report for the President, which might result in an adequate bill. Apart from the representatives of the Presidential Office, the commission consists of envoys of the Ministries for Energy and Mining, Environmental Protection, Science and Technology, Planning as well as Industry and Commerce. In contrast to difficult planning of the nuclear cooperation, numerous achievements can be proven in the field of civil air and space cooperation, since Brazil and China have agreed on their "strategic partnership" in 1993. In 1999 and 2003, the two states placed

[11] In January 2006 Venezuela, Argentina and Brazil signed an agreement on the construction of an 8,000 kilometres long gas pipeline through the whole of South America. Apart from that, the gas- and oil deposits in San Jorge (Argentina) and the Orinoko Basin (Veneuela) are planned to be commonly exploited. In 2005 Brasilia and Caracas agreed on common investments in oil refinery and gas-production projects of the amount of 3.5 billion U.S. dollars.

two commonly built satellites (CBER-1 and CBER-2). Three more bilateral satellite projects are planned for the following years.

The Strategic Partnership between Washington and Delhi

In March 2006, the USA and India founded a "strategic partnership", too. In the context of a bilateral treaty on the cooperation in the peaceful use of nuclear energy, Washington will supply Delhi with the latest nuclear power stations and enriched uranium. Furthermore, the U.S. wants to sell F-16 and F-18 combat aircrafts to India. During President Bush's visit to India, the Pentagon announced:

> "It is our aim to support India in covering its requirements in the defence sector. […]We want to deliver important skills and technologies, which India strives for" (quoted in: Die Welt, 3 March 2006).

In return, the Indian government commits itself for the first time to putting a part of its nuclear installations in charge of the IAEA-controls. Nevertheless, India insisted on excluding eight of its 22 reactors from it. This way the Indian military can continue to produce fissile material for nuclear warheads. Delhi will not open its "fast breeders", which produce vast amounts of weapon-grade plutonium, for international controls. Before the treaty becomes effective, the U.S. Congress has to ratify it. So far, the technology transfer to states not signing the NPT is lawfully prohibited in the USA. Additionally, the Nuclear Supplier Group must agree.

As far as the cooperation with India is concerned, the government of President Bush is above all interested in counterbalancing China in Asia. The moderation of the global oil competition might be another aim of Washington. Just like China, even India, which is growing by more than seven percent a year, has an enormous energy demand and will become a rival to the U.S. over oil reserves in the Far and Middle East. Internally the rapprochement with the USA is highly controversial in India. The opposition criticises the agreement as "carte blanche" for Washington to capture and instrumentalize India. By the delivery of enriched uranium as fuel for the Indian nuclear plants, the U.S. government has a means for putting pressure on the Indian breeder program or the nuclear weapon research, parts of the Indian nuclear establishment say. These critics also regard the foreign policy manoeuvring space as restricted. The Indian Prime Minister Manmohan Singh thought it necessary to state explicitly that India's latest vote against Iran in the IAEA goes back to its miserable willingness to cooperate and not to U.S. pressure (see Guardian, 24 February 2006).

How must the agreement between India and the USA be assessed in view of the containment of proliferation? Positively, because India is now rewarded for not passing on its nu-

clear weapon technique to other countries – unlike Pakistan. One could argue that each agreement allowing the IAEA more inspection rights implies a progress.

Surely, those member states of the NPT that have done without the development of nuclear weapons must feel insulted. They might get the impression as if it had been wiser not to sign the treaty and to develop nuclear weapons in order to be rewarded by nuclear cooperation. This applies to Brazil, for example, which has qualified itself for an intensification of the nuclear cooperation with the USA just like India by its good behaviour – should Washington apply the same standards. In other words: The Indian precedent weakens the international consensus against the passing on of nuclear technology. The comparison of the Indian with the Iranian case leads to a similar conclusion: Who signs the Non-Proliferation Treaty is sanctioned, because he does not comply with its rules. Who refuses to sign is forgiven anything he develops independently – including nuclear weapons.

In the end, the U.S. has lost even more moral authority within the global nuclear policy by its rapprochement with India. This had been decimated anyway, because the superpower does not fulfil its duty of disarming its nuclear weapon arsenals as laid down in the NPT (see Thränert 2004). By this, the arguments of the White House concerning the containment of Iran's and North Korea's nuclear weapon programs lose their powers of persuasion strongly. As far as that goes, even from Washington's perspective, it might (prove to) be wrong to give counterbalancing China more priority than the principle of the non-proliferation. A stronger support in competing for a permanent seat in reformed U.N. Security Council would have been an alternative to the consolidation of the Indian regional power. Overall, the so-called strategic partnership between India and the USA is an exemplary for the triumph of unilateral power politics over the aim of nuclear weapon reduction, which is codified in international law.

6. Conclusion

The Brazilian nuclear program is under extensive international control. As long as Brazil does withdraw from the NPT neither the IAEA nor the U.S. State Department has to become alarmed. If Brasilia in the medium-term and against all expectations were to consider this option in order to develop nuclear weapons after all, Washington would have considerably contributed to this development in view of the Indian example. Nevertheless, from today's perspective a scenario of this kind seems as unlikely as the passing on of Brazilian enrichment technology to the Chavist Venezuela. After all, President da Silva's foreign policy course (just like the one of his predecessor Cardoso) aims at Brazil's establishing as decision

maker within the international system. The aspirant to a permanent seat in the Security Council will not put its hard-earned international prestige at risk in order to invest in a nuclear weapon project, which is hardly eligible for financing anyway. Washington's acceptance of the Brazilian claim to regional leadership is not reflected by the fact that the U.S. government has finally come to terms with the Brazilian uranium enrichment in Resende. Brasilia's commitment in Haiti contributes to this. The U.S. who has reached its limits of power projection capacities acknowledges this gratefully. Furthermore, the Brazilian president is regarded as an honest actor in the White House concerning the considerably strained relations with the governments of Venezuela and Bolivia. In summary, realizing the dependence on strong partners in the different world regions explains the Bush government's Brazil policy that is marked by acceptance and trust[12]. Preferred partners are highly populated democracies with high growth potential and regional leader status. Both Brazil and India present themselves – in the context of the WTO-negotiations, for instance – as actors of the international system that are equally led by clear national interests and therefore calculable.

The Indian case differs from the Brazilian one mainly in the U.S. strategic interest in winning India as long-term ally against China. From this perspective, conventional arm deliveries seem to be an opportune decision and the acceptance of the Indian nuclear weapons a necessity of Realpolitik. After all the bilateral cooperation in civil use of nuclear energy serves the purpose of reducing the pressure on the global energy market. In view of these higher strategic aims, the undermining of the anyway outdated Non-Proliferation Treaty is an acceptable collateral damage for Washington. As far as this goes, the nuclear cooperation with a non-NPT-signatory state marks new territory for the USA. Nevertheless, by the safety device of worldwide energy resources and the subordination of multilateral treaties and international law the cooperation treaty with India reflects two keynotes of President Bush's foreign policy. While explaining the hard line opposite Teheran another principle propagated by the Bush administration takes effect: Cooperation with democracies and containment of authoritarian states. Washington's cooperation with the main proliferator Pakistan in the containment of transnational terrorism stands again for a short-breathed pragmatism, which superimposes on the foreign policy principles and the keynotes.

From Brazilian perspective, Washington's incalculable foreign and nuclear policy and especially the historic experience of futile waiting for U.S. nuclear expertise speak against striving for an exclusive partnership with the superpower. So far, Brazil has not yet found its role

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[12] In the Africa strategy of the White House a procedure is exemplified, which intents to facilitate the intervention in different subregions of Africa by good relations with so-called *key anchor states*. See under www.whitehouse.gov/infocus/africa.

within the concert of nuclear powers. At this point, it is hard to say, if Brasilia will decide between Washington and Peking or if it will find its way together with other Southern regional leaders such as India and South Africa. Independent of possible partners, in the future Brazil should manage to redress its scarcity of energy on the one hand and to play a vital role in the worldwide trade with enriched uranium on the other hand. After all Brazil is one of very few countries, which have enormous uranium deposits and an efficient enrichment technology at the same time. If the currently starting social debate on the pro and contra of nuclear energy in Brazil results in an expansion of the nuclear sector, the scenario of a civil nuclear power is most likely for the Amazon state.

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