

# COMPARATIVE NUCLEAR POLICY: A CASE STUDY OF U.S. IMPACT ON INDIA AND BRAZIL PROGRAMS (1946-2018)<sup>1</sup>

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## Introduction

The first state to possess nuclear weapon technology and still the largest military superpower, the United States of America represents a major player in the nuclear nonproliferation regime. Given the pivotal role of nuclear technology during the Cold War, leading to a nuclear deterrence situation between the US and Soviet blocs, other countries began to develop their nuclear programs, some for the purpose of energy production, others for possession of atomic weaponry or to achieve both objectives.

Among the countries dedicated to pursuing a national nuclear program, Brazil and India stand out. Both began their programs after World War II, at a time when the development of nuclear technology was encouraged by policy such as the US government's "Atoms for Peace." Brasilia and New Delhi imagined that the development of nuclear technology and mastery of the uranium cycle could mean an important source of energy, solving one of their major economic bottlenecks.

Additionally, Brazil and India's nuclear programs need to be understood from the relationships they present within their regions and foreign influences. From the discussions made by Buzan and Wæver (2003), it is

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necessary to understand that the regions create their dilemmas and constellations of security, from the internal disputes and the dynamics of relationships that the states have among themselves, but also from the penetration of global dynamics generated by the great and – or – superpowers.

In this sense, the importance and impact of the relationship between the two programs with the US is highlighted, as it occurs differently within the two regions, more specifically within the position it will have in the two Regional Security Complexes (CRS). In the South American CRS, the US projects its power directly to the present day and is militarily dominant, in the South Asian CRS, the US is not the only military power and the Eurasian strategic environment encompasses global geopolitical disputes (Buzan & Weaver 2003).

The South Asian CRS will be marked by the existence of different disputes and different external actors intervening and modifying the internal disputes within the complex. During the Cold War, the US position in the complex to cope with the expansion of the Soviet Union (USSR) in the region and Central Asia builds a complex diametrically different from that of South America. Later the emergence of China and Japan as major powers amplified the regional and global disputes, enabling articulations and arrangements not seen by the South American countries<sup>4</sup>.

To better understand the development of nuclear programs, it is essential to follow the regional dynamics that occur throughout the late mid-twentieth century and the first two decades of the 21st century. In addition, understanding the evolution of internal disputes over complexes allows for a better understanding of the choices they have made for the future of their nuclear programs. In a context of intense insecurity and conflict with its neighbors and rivals – Pakistan and China – India has opted for the development and mastery of nuclear technology, also for military purposes. In the case of Brazil, especially from the resumption and improvement of relations with Argentina, the country's main opponent – and today partner – in the region, led to the abandonment of the idea of building a nuclear artifact.

However, only the analysis of regional dynamics would be insufficient to understand the incentives or constraints over the years to advance or re-grow the respective nuclear programs. Many of these situations are affected by the context of relations with the US. Therefore, the choice to persist in the

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4 Even before it was considered a global power, given the lack of capacity to influence in all regions, China was already a major factor in security dynamics in South Asia as it borders India. This situation becomes clear after the 1962 Sino-Indian conflict, and the subsequent cooperation between Beijing and Islamabad, heightening regional tensions and New Delhi's perception of insecurity.

development of an autonomous nuclear program goes beyond the possibilities of negotiating or bargaining with the US, as well as its interest in the region, facilitating or boycotting the projects of Brazil and India.

This paper seeks to build, from a historical perspective, the US participation in the Brazilian and Indian nuclear programs, arguing that Washington was fundamental to the calculations of both, conditioning their choices and even enabling – or not – the projects. The US advocacy of nonproliferation was not uniform, much less its role within the regime, as is clear from the progress of this article, and Washington has changed its approach depending on the challenges and interests it had in the regions and their overall strategy.

To this end, the text will analyze separately the interaction of the two countries with the US, especially in their nuclear relations. In the first part the history of the Indian nuclear program (INP), and how was its relationship with Washington, outlining the moments where there was a closer proximity and the moments of resurgence of nuclear cooperation between them, until the civil nuclear agreement of 2008 will be presented. In the second part, the Brazilian nuclear program (PNB) is analysed and how the presence of the US as a hemispheric power eventually conditioned Brasilia's choices and possibilities in the field. Finally, the text summarizes these reflections.

## **The Indian nuclear program and United States: divergence and convergence (1946/2018)**

Historically, the relationship between India and the US has been characterized more by stages of detachment than approximation, associated with the nature of Indian Cold War foreign policy, its rapprochement with the Non-Aligned Movement and its regional geopolitical position. By comparison, the US weight on India's foreign agenda is less relevant than in the Brazilian case for strategic, social and cultural reasons, which allows India some leeway in this country.

This distancing movement was prevalent until the 21st century, when changes in the Indian geo-economic and geopolitical weight evidenced a growth in the relative importance of the country in the regional and global scenario and changed the American perception. Other changes in the world scenario, associated with the rise of China, instability in Russia and phenomena such as the expansion of transnational risks such as post-2001 terrorism, have fostered a greater convergence of US-Indian interests. India has come to occupy a more relevant strategic space in US thinking, broadening its bargain with the still prevailing hegemony.

In this context, the Indian domain of nuclear technology, and the development of INP, have undergone changes in their character and priorities. The US moved from a role of restraint and disagreement over this program to a convergence agenda, which in 2008 resulted in a major bilateral nuclear agreement. Chronologically, we consider that the India-US nuclear exchange can be divided into three phases: encouragement, assistance and detachment (1947 to 1978); insulation and pressure (1978 to 2001); and recognition and cooperation (2001/2018)<sup>5</sup>.

#### *A) Encouragement, Assistance and Detachment (1947/1978)*

A historic view of the Indian government, which took place for most of the twentieth century, was that nuclear power could generate many benefits and catalyze the development of all mankind, as well as exposing the risks of the nuclear race and calling for the disarmament of countries that they had nuclear warheads (Chakma 2005, Mishra 1997). Such a view already exists in the years before independence with the establishment of the Tata Institute of Fundamental Research in 1944 (TIFR) and, in 1946, the Atomic Energy Research Committee (AERC) (Chakma 2005). Shortly after independence in 1947, India began its nuclear program to develop technology to meet its energy needs, using the first Third World country for a program of that kind (Vanaik 1995).

The INP began in 1948 with the creation of the Indian Atomic Energy Commission (Pant 1984, Chakma 2005). In this way, India is dedicated to the peaceful development of nuclear energy, defending disarmament and abdication of nuclear racing (Charnysh 2009). Program development was facilitated by the Atomic Energy Commission (AEC), which placed all uranium and thorium reserves under government control and, in 1954, by the creation of the Department of Atomic Energy (DAE) (Chakma 2005).

In order to accelerate the development of the nuclear program, India

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<sup>5</sup> This division bears some resemblance to Chakma's (2005) on INP, but advances in historical periods and emphasizes the interrelationship between INP and the United States. For Chakma (2005), the focus is on the Indian agenda, and the INP has three phases: 1946-1964, which is based on Indian independence and Chinese nuclear tests, and was focused on the economic and social development of the Indian state and its people; 1964 to 1974, a rethinking of nuclear policy, keeping open the option of 'go nuclear', that is, to become nuclear armed. At this stage, India opposed the NPT and led, as it became known, the 'Peaceful Nuclear Explosion' (PNE) in 1974; 1974 to 1998, marked by the 'nuclear ambiguity', in which the country advocated nuclear disarmament but at the same time kept open the option to nuclearize, until in May 1998 India conducted the Pokhran 2 tests, and declares to the world a country with nuclear arsenal (Chakma 2005, Charnysh 2009, Centre for Science and Security Studies 2017).

sought technological and financial support from developed countries to build the program's structure, obtaining support for the construction of reactors and nuclear-critical raw materials such as enriched uranium, particularly for from the Atoms for Peace program of the US government (Chakma 2005, Andrade, Carpes & Leite 2017, Charnysh 2009). It was through international cooperation and aid that India acquired its first reactors: the first being the '*Aspara Research Reactor*', with British support in 1955 and the following year the country acquired the second reactor from Canada, CIRUS, which had US support for the supply of heavy water that fed it (Charnysh 2009).

In addition to providing heavy water to feed the CIRUS reactor, India and the US agreed in 1963 to supply two US reactors to India. In turn, Indians agreed to use only enriched uranium in the US to power the country's reactors (Charnysh 2009). In addition, it was agreed that the IAEA would verify Indian facilities to ensure that uranium was used for peaceful rather than military purposes. Later, in 1966, the two countries negotiated the sending of US plutonium to India, which would be used for research in the area (Charnysh 2009).

Modifications to the INP, which remained tied only to the peaceful uses of technology in the early years, began in the 1960s and were related to the deterioration of relations between India and its main regional rivals: Pakistan and China, especially after the defeat in the Sino-Indian war and Chinese nuclear tests of 1964 (Chakma 2005, Subrahmanyam 2018, Vanaik 1995, Pant 2007, Charnysh 2009). After such instability in its regional surroundings, the project acquired a twofold character: at the same time as the civil use of nuclear energy, the program laid the foundation for the country to choose, if necessary, to build a military nuclear program (Vanaik 1995).

Such changes in nuclear policy were the result of the debate that began after China's tests. Different prominent figures in Indian politics and society have demanded a more assertive position from the Indian government to pursue India's development of nuclear weapons in order to safeguard the country from the Chinese threat (Chakma 2005). Within the disputes on the subject, one element was the moral debate over owning a nuclear bomb: by avoiding developing the bomb the country could continue to cry out for the disarmament of the world, while those in favor of the bomb claimed to be naive to imagine the world without nuclear weapons at the moment, and to refrain from possessing them, would be to believe that only morals could guarantee the security of the country (Chakma 2005, Andrade, Carpes & Leite 2017).

Another point in the debate at the time was whether China's possession of nuclear weapons posed a threat to India (Chakma 2005). Some argued

that the Chinese tests posed no danger to the country as they aimed to respond to global power disputes against the US and USSR. On the other hand, others advocated for the weapon to avoid taking risks by assuming that even if they were not to be used against India, bombs could at least be used to disproportionately increase Chinese bargaining power in the negotiations with the country (Chakma 2005). Thus, the relationship with China is fundamental for understanding the INP, as well as for analyzing the US relationship and interest in a nuclear India.

The debate on nuclear weaponry and its aftermath benefited from the rapid development of the INP, which made it capable of starting the nuclear blast project as early as 1965: the subterranean nuclear explosion project (SNEP) (Chakma 2005, Subrahmanyam 2018). The result of research developed from the SNEP and the separation of plutonium at the *Trombay* facility was the ability to perform PNE in 1974 (Charnysh 2009). In addition, following the war with Pakistan in 1965 and Chinese support for the Pakistanis, India came to consider the nuclear option as an important way of securing the country from the threat posed by the approach between Beijing and Islamabad (Chakma 2005).

The US position under Lyndon B. Johnson helped India build the capacity to develop its nuclear program, even in the military. With the view that India would acquire long-term military capabilities, the Johnson government, motivated by the Chinese tests, saw India as a way to confront communist China, since US relations with mainland China were only resumed on 1971, already in the Nixon government (Sarkar 2015).

The PNE was the result of the debates that took over the country and influenced the SNEP to be created. The creation of the SNEP resulted from a number of factors: internal pressure on Indian governments from within the Indian National Congress Party; a reorientation of the country's nuclear policy, greatly influenced by events that occurred in the 1960s; and by the Indian perception that it could not count on the global powers (Chakma 2005). Prime Minister Indira Gandhi has opened the possibility, even if not definitively, of a military nuclear project to master the technology for nuclear arsenal purposes (Chakma 2005).

The new Indian stance was already noted in the NPT negotiations with the Indian opposition, given the poor results achieved in its objectives. According to Chakma (2005): "While India wanted a reversal of the current process of nuclear proliferation, the major powers' primary aim was to stop further horizontal proliferation of nuclear weapons. This gap in objectives is finally hardened India's stance against NPT" (Chakma 2005, p. 208). During the treaty negotiations, Indian delegates advocated the possibility of peaceful

nuclear explosions, already indicative of the country's claims, which came to fruition in 1974 (Chakma 2005).

The PNE or '*Pokhran Test I*' was conducted in a decade of great importance to India, as in 1971 the war against West Pakistan in the name of Bangladeshi independence led the Indian government to fear Chinese (including nuclear) support for Pakistan (Subrahmanyam 2018). Subrahmanyam (2018) states that the US government in the figure of Henry Kissinger following his trip to China warned the Indian representative in Washington that they would not intervene in case of Chinese aid to the Islamabad cause, leading the government of Indira Gandhi to sign the Indo-Soviet treaty as a way of seeking to prevent a Chinese nuclear attack in response to Indian action in the Bangladeshi War of Independence (Subrahmanyam 2018). This US position showed that the relationship between the two countries was cooling down as the US government increasingly valued the relationship with Beijing in an attempt to curb Moscow to the detriment of its relationship with New Delhi.

In addition, President Nixon's government, of which Kissinger was a national security adviser, perceived India as a "Soviet puppet," even suggesting that China would side with Pakistan in the 1971 conflict (Burr 2005). However, in September 1972, a study on the possibility of a test by India sought to detail what the test meant for the US, as well as what the US government's options would be in the different scenarios. The paper outlines what Washington's goal should be:

Limiting the number of nuclear powers remains a major US interest. Additional interests are our desire for a stable South Asia, and our wish to develop mutually satisfactory relations with India. Since an Indian nuclear decision would probably conflict with all three interests, our objective should be to do what we can to avert or delay an Indian test and, if these efforts fail, to limit the harmful repercussions. (United States of America 1972).

Nevertheless, the document recognizes that:

The choices divide between things we can do before and after an Indian nuclear explosion. In both instances US ability to influence events is marginal. Indeed, given the present poor state of Indo-US relations, an overly visible US effort could hasten, rather than delay, the day India explodes a nuclear device. Multilateral and non-US bilateral efforts, especially if joined by the Soviets, have somewhat better prospects of affecting Indian actions, but would probably not per se be decisive. (United States of America 1972).

Since the aforementioned document was most likely to present a nu-



clear test by India, in May 1974 New Delhi shows that it mastered the technology for nuclear explosions, making its first such test, albeit with the name of peaceful explosion. The test featured an Indian attempt not to break the agreements it had signed, so even though it signed the Partial Nuclear Test Ban Treaty (PTBT), India used a breach in the treaty, which did not veto testing underground, where it conducted the 1974 test (Andrade, Carpes & Leite 2017).

Despite the allegations made by the Indians, not all governments accepted the explanations from the Asian country, leading to US sanctions and Canada's investment cuts in the INP when it realized that the Canadian reactor was used to produce the material needed to the explosion, prompting the Indian government to cancel other tests aimed at conducting (Charnysh 2009).

It was from the Indian PNE that the United States changed its action within the nonproliferation regime, as it was relegated to the background against other more important Cold War matters (MARTINEZ, 2002). The Indian test, according to Martinez, "(...) served as notice to the United States that nuclear nonproliferation was no longer a tangential foreign policy issue" (MARTINEZ, 2002, p. 262).

### *B) Insulation and Pressure (1978/2001)*

The Nuclear Partnership, already shaken by the PNE, ceases to occur following the approval by the US Congress of the 'Nuclear Non-Proliferation Act' in 1978, which made it impossible for the US to negotiate any nuclear element with countries that did not have their facilities under IAEA safeguards, leading to the interruption of US assistance to India (Sharnysh 2009). This US measure is taken at the same time that the INP underwent transformations, and was structured on the Indian PNE of 1974 (Paranjpe 2013). The issue of nonproliferation becomes a key topic for India-US relations, a situation that will only be better resolved from the 2000s.

According to Andrade, Carpes and Leite (2017) international pressures, as well as difficulties in obtaining technology and fuel for nuclear facilities after the PNE, subsequently contributed to the loss of INP leading to its stoppage in 1977, thus maintained throughout the Janata Party government. Regarding the relationship with the US, President Carter sought to get closer to India. In an attempt to mitigate the US inclination to prioritize relations with Pakistan, the president visited India and urged countries to build closer relations (Martinez 2002).



Moreover, despite advocating nonproliferation, the Carter government approved in 1978 and 1980 the sending of nuclear material to India, even after the 1974 tests, in an attempt to bring India closer to the US (Martinez 2002). The president justified this stance by stating that:

India's failure to accept international safeguards on all its peaceful nuclear activities and its failure to commit itself not to conduct further nuclear explosions are of serious concern to me. These exports will help us maintain a dialogue with India in which we try to narrow our differences on these issues. (Carter apud Martinez, 2002, p. 277-278).

Therefore, relying on US supply, the INP was reactivated as soon as the INC regained power, with Indira returning to the position of prime minister in the early 1980s (Charnysh 2009). With the new government, the country continued to develop its nuclear capabilities, and further developed a medium-range guided missile system (Charnysh 2009).

This resumption of the INP can be understood from the US action to lift the sanctions imposed on Pakistan in 1979, which allowed Islamabad to revitalize its nuclear program – with Chinese support – as well as modernize its Armed Forces (Pant & Super 2015). The suspension of sanctions on the Indian rival and neighbor, generated by the invasion of the Soviet Union (USSR) in Afghanistan, presented the priority that the US gave to Islamabad, which worried India, even though the Carter administration had sought to approach the country, New Delhi did not receive this news with excitement, disrupting the resumption of their relationship (Pant & Super 2015, Martinez 2002).

At the beginning of his government, Ronald Reagan, by prioritizing relations with Pakistan, ultimately worsened relations with India, which, as in 1971, sought closer ties with the USSR to respond to the dilemmas arising from the strengthening of relations between Islamabad and Washington. Although US arms granted to Pakistan would be used exclusively against the communists, at least according to the Americans, New Delhi interpreted the US stance as a hostile movement contrary to regional stability, undermining the resumption of relations between the two countries, especially when sending F-16s to Pakistan (Harrison 1981, Weinraub 1982).

What is observed in the period separating the 1974 PNE from *Pokhran II* in 1998 is the characteristic of an “ambiguous” nuclear program (Chakma 2005). This ambiguity is understood by the position of the Indian governments of: “(...) neither confirming its pursuit of a military nuclear program” (CHAKMA, 2005, p. 218). However, the intensification of Sino-Pakistani relations, with the development of nuclear capacity by the Islamabad govern-

ment, made India increasingly see the option of “Go Nuclear” as the only answer to the dilemmas that were presented.

The 1980s and 1990s marked the resumption of the Indian nuclear project and the momentum of nuclear technology by India, developing nuclear warheads and acquiring launch capabilities from Indira’s ballistic missile program launched in 1983 (Andrade, Carpes & Leite 2017, Chakma 2005, Charnysh 2009). Despite its position of not being fully in favor of nuclear weapons, Indira was open to the option if necessary (Chakma 2005).

In 1982, on a visit to the United States, Indira Gandhi and US President Reagan struck a deal for India to continue to have access to uranium for its nuclear plants. Since the US Congress, from the 1978 Nuclear Act barred nuclear shipments - after Carter’s shipments - the two countries agreed that it would be up to a third party to supply fuel to Indian facilities, in this case France (Weinraub 1982). This was intended to ensure that countries could resume building a closer relationship, as well as allaying Indian fears about the US military partnership with Pakistan.

By involving a third party in the deal, the US envisioned ensuring that relations with India continued to improve, while India made it possible to import radioactive material without safeguards in place. However, the agreement, signed in 1982, ends with the embargo imposed by the Nuclear Suppliers Group (NSG) from 1992 onwards on the INP (Weiss 2007). The provision of radioactive material for different nuclear programs was conditional upon the application and adoption of safeguards, to which India was opposed.

The policy of a resumption of relations between the two countries was pursued by Indira’s son who took power, Rajiv Gandhi, who kept the nuclear option open and invested in keeping India up-to-date with field technologies (Chakma 2005). Still under the Rajiv government, Indian scientists began working on thermonuclear weapons around the years 1984 and 1985, leading to increased nuclear competition between India and Pakistan, which was also seeking to develop its own bomb (Chakma 2005).

Rajiv’s more liberal economic policies were well received by the White House, and led to agreements between New Delhi and Washington, still under the Reagan administration, although the relationship remained limited until the end of the Cold War (Pant & Super 2015). The end of the Cold War provided a resumption of relations, especially with the end of the bipolar dispute in the Indian subcontinent. However, India continued to have an interest in nuclear weapons control.

Different Indian governments in the 1990s flirted with the nuclear test. Narashima Rao’s government planned to conduct nuclear tests as early

as 1995 before the Comprehensive Nuclear Test Ban Treaty (CTBT), as well as other countries. However, it eventually gave up under pressure from the US government, which again had as its fundamental advocacy of nonproliferation under the Clinton administration, highlighting the economic and political risks of testing (Chakma 2005, Weiss 2007). In its two-week government in 1996, the Bharatiya Janata Party (BJP) also declared its interest in conducting the tests but did not have enough time (Chakma 2005).

The resumption of relations is evident in the 1995 India-US Defense Cooperation Draft, which created the Defense Policy Group (DPG), which was responsible for resolving defense cooperation issues and the Joint Steering Committee (JSC) aimed at discuss the exchange of personnel and information, as well as joint exercises (Paranjpe 2013). However, the progress of the relationship between countries faced certain obstacles: the concern of the Bill Clinton administration regarding Kashmir, disarmament and nonproliferation; and mainly the *Pokhran II* nuclear tests in 1998 (Pant & Super 2015, Paranjpe 2013).

The BJP's coming to power in 1996 and 1998 was a very important factor in India's rapid development of its nuclear capabilities for military purposes, which saw the possession of nuclear weapons as a source of pride for the country (Charnysh 2009, Weiss 2007). The party had an understanding that India was being surrounded, with partnerships and rapprochement between the US, China and Pakistan, isolating the country and endangering its security (Mishra 1997). In addition, preparations for the test had been underway since 1995 and, according to Weiss (2007), "just push the button" was enough, which the BJP did in regaining power in 1998.

The main moment for INP and nuclear deterrence in South Asia was reached in 1998, when India and Pakistan conducted nuclear tests and declared themselves nuclear armed to the world (Charnysh 2009). In this way, these neighbors, and rivals, obtained the technology they pursued for much of the second half of the twentieth century. The US response to the tests was to impose sanctions on both countries and to curb their rapprochement with New Delhi (Paranjpe 2013, Charnysh 2009).

In order to regain the relationship that had been built prior to May 1998, India's Foreign Minister Jaswant Singh began a series of talks with US Deputy Secretary of State Strobe Talbott following the tests of *Pokhran II* in order to try to present the Indian reasons for the test (Paranjpe 2013, Weiss 2007). However, what began to resume the relationship of the first half of the 1990s were: US support for India in the 1999 Kargil war, and Clinton's visits to India in 2000 and Vajpayee's visits to the US in 2000 and 2001, at the second opportunity already in the Bush administration (Paranjpe 2013, Mohan

2006, Pant & Super 2015).

On Clinton's visit to India, it was clear that disagreements still existed, but that the two states would pursue ever closer relations, including in the nuclear area. The two governments stated in a joint statement that:

The United States believes India should forego nuclear weapons. India believes that it needs to maintain a credible minimum nuclear deterrent in keeping with its own assessment of its security needs. Nonetheless, India and the U.S. are prepared to work together to prevent the proliferation of nuclear weapons and their means of delivery. To this end, we will persist with and build upon the productive bilateral dialogue already underway. (Tomar 2002).

*C) Recognition and cooperation (2001/2018)*

Despite moves to resume relations between the two countries after the 1998 nuclear tests, it is with the attacks of September 11, 2001, that the road to building a good relationship between countries is paved. However, days earlier, US Ambassador to India, Robert D. Blackwill, in a speech to the Indo-American Chamber of Commerce, recalled President Bush's position on relations between the two countries, which he said to the Indian Ambassador in Washington, Lalit Mansingh, who: "After years of strangulation, India and the United States together surrendered to reality. They recognized an unavoidable fact – they are destined to have a qualitatively different and better relationship than in the past." (United States of America, 2001b).

In the same year, the Indian parliament was the target of a terrorist attack, which reaffirmed the interest of India and the US to collaborate on security issues, especially in the fight against terrorism (Paranjpe 2013; Pant & Super 2015). Still in September 2001, the US suspended the sanctions it had imposed on India and Pakistan after the tests, following both Bush's anti-terror campaign support following the terrorist attacks in the US (Charnysh 2009, United States of America 2001a).

Unlike the Clinton administration: "The Bush administration, from the very beginning, refused to look at India through the prism of nonproliferation and viewed India as a natural and strategic ally." (Pant 2008, p. 21). The Bush administration was a watershed for the US-India relationship, as Mohan (2006) points out:

It took Bush (...) to transform the strategic context of U.S.- Indian relations. Convinced that India's influence will stretch far beyond its immediate neighborhood, Bush has reconceived the framework of U.S. engagement

with New Delhi. He has removed many of the sanctions, opened the door for high-tech cooperation, lent political support to India's own war on terrorism, ended the historical U.S. tilt toward Pakistan on Kashmir, and repositioned the United States in the Sino-Indian equation by drawing closer to New Delhi. (Mohan 2006, p. 5).

In 2004, India and the US agreed to expand cooperation in three areas: nuclear civil activities, space civil programs, and high technology exchange; first phase of the Next Steps in Strategic Partnership (NSSP) (United States of America 2004). In the NSSP release statement of January 12, 2004, President Bush stated that cooperation in these areas would: "*deepen the ties of commerce and friendship between our two nations, and will increase stability in Asia and beyond.*" (United States of America 2004). Still in the statement, President Bush points to the fact that the NSSP would transform the relationship between the two countries, stating that:

The expanded cooperation launched today is an important milestone in transforming the relationship between the United States and India. That relationship is based increasingly on common values and common interests. We are working together to promote global peace and prosperity. We are partner in the war on terrorism and we are partners in controlling the proliferation of weapons of mass destruction and the means to deliver them. (United States of America 2004).

In July 2005, on Indian Prime Minister Manmohan Singh's visit to the US, the two leaders agreed to expand their relations in the nuclear field, specifically in the area of civil nuclear technology (United States of America 2005). In a joint statement, countries pointed out their interests and objectives in the area:

President Bush conveyed his appreciation to the Prime Minister over India's strong commitment to preventing WMD proliferation and stated that as a responsible state with advanced nuclear technology, India should acquire the same benefits and advantages as other such states. The President told the Prime Minister that he will work to achieve full civil nuclear energy cooperation with India as it realizes its goals of promoting nuclear power and achieving energy security. The President would also seek agreement from Congress to adjust U.S. laws and policies, and the United States will work with friends and allies to adjust international regimes to enable full civil nuclear energy cooperation and trade with India, including but not limited to expeditious consideration of fuel supplies for safeguarded nuclear reactors at Tarapur. In the meantime, the United States will encourage

its partners to also consider this request expeditiously. (United States of America 2005).

By the other hand, the Indian government was committed to:

The Prime Minister conveyed that for his part, India would reciprocally agree that it would be ready to assume the same responsibilities and practices and acquire the same benefits and advantages as other leading countries with advanced nuclear technology, such as the United States. These responsibilities and practices consist of identifying and separating civilian and military nuclear facilities and programs in a phased manner and filing a declaration regarding its civilians facilities with the International Atomic Energy Agency (IAEA); taking a decision to place voluntarily its civilian nuclear facilities under IAEA safeguards; signing and adhering to an Additional Protocol with respect to civilian nuclear facilities; continuing India's unilateral moratorium on nuclear testing; working with the United States for the conclusion of a multilateral Fissile Material Cut Off Treaty; refraining from transfer of enrichment and reprocessing technologies to states that do not have them and supporting international efforts to limit their spread; and ensuring that the necessary steps have been taken to secure nuclear materials and technology through comprehensive export control legislation and through harmonization and adherence to Missile Technology

On Singh's visit to the US, President Bush's government was in favor of restructuring the institutions of the international system themselves, which should adapt to the changing international environment, especially with the rise of India and the new position it should occupy (United States of America 2005).

The statement about the possible deal was widely criticized and challenged, both internally and externally, prompting the White House to issue a press release in which it responded to some of the criticism. In the statement, the White House states, among other things, that the agreement was of mutual interest, in addition to stating that India, even though not a signatory to the NPT, was a reliable country, and had "(...) a strong nuclear nonproliferation record. "(United States of America 2006). For this reason, INP should not be compared to Iranian and North Korean. In the same statement, the White House differentiates INP from Pakistan, saying that:

Pakistan and India are different countries with different needs and different histories. Our relationship with Pakistan, which has Major Non-NA-TO Ally status, follows a separate path that reflects our countries' strong commitment to maintaining close ties and cooperation, including in the War on Terror. However, Pakistan does not have the same nonproliferation

record as India, nor the same energy needs. We do not intend to pursue a similar civil nuclear cooperation initiative with Pakistan. (United States of America 2006).

On the basis of ever closer nuclear cooperation, in October 2008 India signed the “123” Bilateral Agreement with the US, which dealt with the provision of technology and raw material for the Indian civilian nuclear program cooperation in the energy and satellite sectors (Charnysh 2009). The deal:

(...) lifts a three-decade US moratorium on nuclear trade with India by providing assistance to India’s civilian nuclear energy program and expanding US-Indian cooperation in energy and satellite technology. (Sharnysh 2009, p. 5).

The agreement, signed by US Secretary of State Condoleezza Rice and Indian Foreign Minister Pranab Mukherjee on October 10, 2008, took just over three years to pass at the US Congress on October 1, 2008 (United States of America 2008). The trajectory of the agreement since the joint declaration in July 2005 can be summarized as follows:

In December 2006, the U.S. Congress passed the Henry J. Hyde U.S.-India Peaceful Atomic Energy Cooperation Act (Hyde Act), which provides a framework in U.S. law for facilitating civil nuclear cooperation with India. In July 2007, the United States and India concluded negotiations on the 123 agreement, which required approval by the U.S. Congress to be brought into force. The Board of Governors of the International Atomic Energy Agency (IAEA) in Vienna, Austria approved the India Safeguards Agreement on August 1, 2008. Another key prerequisite for submitting the 123 Agreement also took place in Vienna, with the Nuclear Suppliers Group (NSG) consensus decision on September 6, 2008 to grant an exception to its full-scope safeguards requirement to permit civil nuclear supply to India. (United States of America 2008).

By signing the agreement with India, the US has modified its own operations within the nonproliferation regime, including the Nonproliferation Act (Charnysh 2009). As part of the agreement for cooperation and development of civil nuclear technology, India promoted the separation of its nuclear plants, separating civilian from military facilities, and placing the former under IAEA safeguards (Charnysh 2009, Mohan 2006).

In response to the changing US stance towards the INP, India has moved to favor the US at various times, institutions and regimes: whether it



is voting against Iran in the IAEA, operationally supporting the Afghan incursion, or supporting the US (even though it has retreated at the last minute) in Iraq, movements that have been positively received in Washington (Mohan 2006). New Delhi stated that: "(...) improving its global position and gaining leverage in its relations with other great powers" (Mohan 2006, p. 6).

Following the agreement signed with the US, the Nuclear Suppliers Group removes India's ban on participating in international nuclear trade in September 2008 (Charnysh 2009). Enabling the country to enter the nuclear market, even if it has not signed to the NPT, leading it to occupy a privileged position within the nonproliferation regime.

Although the agreement is specific for civilian purposes, it could benefit the Indian military program, as the country could use internationally purchased fuel to its civilian facilities - under safeguards - as it would use its fully domestically produced fuel for military installations (Charnysh 2009). However, India considers itself a 'responsible' nuclear armed state, that is, it wants to be a partner of nuclear nonproliferation, not a target (Charnysh 2009).

However, the progress of the relationship during the Bush administration was not accompanied by the beginning of the Obama administration, losing part of the momentum. This can be understood, in part, by Obama's opposition, as a senator, to the nuclear deal with India (Pant & Joshi 2016). This begins to change with Modi's arrival as prime minister, leading to recognition of India as a rising power by the US, and Obama being the guest of Republic Day in India in 2016 (Pant & Joshi 2016).

In a joint statement in 2014, President Obama and Prime Minister Modi reaffirmed their commitment to the civil nuclear agreement signed in the previous decade. In addition, they pledged to achieve the goal of producing nuclear power from US facilities to be built in India, in partnership with US companies such as Westinghouse and GE-Hitachi (The White House 2014).

The nuclear agreement signed between Washington and New Delhi was instrumental in ensuring cooperation between countries and in addressing various areas, renewing the US-India Defense Relationship in 2015 for another ten years (Mohan 2006, Pant & Joshi 2016). Therefore, India and the US have built the foundations on which to lay down their strategies to curb the main threat in their view: China. This materializes in the fact that "(...) India's 'Look East' Policy and America's 'pivot' to Asia seem destined for a common strategic endeavor in the Indo-Pacific." (Pant & Joshi 2016, p. 54).

Given that "(...) India and China are long-term rivals and India's capacity to internally balance China is limited, the only option is to balance China with US help." (Pant & Joshi 2016, p. 45), Modi has the view that relations

with the US are a key factor and part of the Indian regional strategy for Asia Pacific (Pant & Joshi 2016). The positions of India and the US are on balancing China: the US wants to curb Chinese growth, and India seeks to prevent a greater presence of Beijing in its vicinity, as well as to rival China in Southeast Asia, making the relationship one that interests both (Mohan 2006).

The last phase of the INP and its relationship with the US show a significant improvement in the patterns that marked the relationship between New Delhi and Washington. Proof of this was the most recent nuclear agreement, which can be understood as a US recognition of Indian status as a nuclear weapon holder - and may even be interpreted as a kind of "reward" to India, even if India acted in breach of the agreements and international nuclear regimes.

Therefore, what can be concluded is that the Indian project had moments of inflection, but maintained coherence with the concerns and perceptions of the Indian governments, making the choice of nuclear weapons a political choice (Chakma 2005). However, the nuclear alternative is a strategy beyond security: it is a means of achieving new status in the international system, as noted in the following statement: "So India had only one option, that is to go nuclear and to make nuclear bomb not because China or Pakistan did it but was recognized as a world power in the international scene" (Mahajan apud Mishra, 1997, p. 62, emphasis added). Although Vanaik (1995) claims that: "Though nuclear bombs are currency of power, they are enormously devalued currency" (Vanaik 1995, p. 98), what is observed was a gain of power and status by India, as well as recognition from various countries, in particular from the US, including its support for the Indian candidacy for a permanent seat on the United Nations Security Council (UNSC).

## **The Brazilian nuclear program and the USA: an interchange agenda (1946/2018)**

In the Brazilian case, the nuclear program is conditioned by a pattern of more constant oscillations resulting from polarizations between the axis of autonomy and alignment of international relations, focusing on the USA<sup>6</sup>. This phenomenon occurs because, according to Martins and Nunes (2017), there is a close correlation between foreign policy, defense policy and the development model, which affects the bases of national power. These US alterations and impacts on BNP are then examined at the following stages: pro-

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<sup>6</sup> Here will be brought only the main points of the agendas, for a more comprehensive reading see Visentini 2013, Vizentini 1998 and Vigevani & Cepaluni 2007

gram origins: partnership and maturity (1947/1961); autonomy and national power (1961/1989); retreat and alignment (1989/1999); and discontinuous autonomy (1999/2018).

*A) The Origins of the Program: Partnership and Maturity (1947/1961)*

For Brazil, the period spanning the end of World War II and the beginning of the Cold War between 1945 and 1947 was characterized by a phase of readjustment in its domestic and foreign policies. From 1930 to 1945, the Getúlio Vargas government, particularly in the phase known as the Estado Novo (1937/1945), developed a political-economic agenda for modernization via the import substitution industrialization (ISI) process, and a bargaining agenda in international relations. In both cases, internal and external, technological progress was perceived as a central and necessary element for national development.

Due to the polarized scenario of the Second World War (1939/1945), the Vargas political-economic-diplomatic bargain became the preferred tactic for achieving this development. As a product of the US-Brazil-Germany strategic triangulation, Brazil can benefit from US concessions from the 1940s. This phase resulted in the construction of the National Steel Company (CSN) and the modernization of the armed forces.

The Brazil-US partnership was present in the nuclear field, focusing on strategic minerals, uranium and thorium. The Brazilian strategic reserves of these and other inputs relevant to the nascent nuclear age were a comparative advantage to be explored, becoming a bargaining mechanism. As Ferreira and Lira (2016) indicate, in the 1940s, two results were obtained: the signing of the Cooperation Program for Prospecting Mineral Resources and the first Brazil-US Atomic Agreement. Internally, the authors also recall the creation of the Strategic Mineral Studies and Supervision Commission (CEFME), in view of the relevance of these resources to national security.

However, these agreements had some limitations due to the restrictions that would be imposed on trade in strategic minerals and the transfer of nuclear technology by the US (McMahon Act) and the UN (Baruch Plan). Likewise, the United Nations Atomic Energy Commission was created. In this moment, a structure was being designed to constrain the democratized development of nuclear energy and its associated research, which would become more comprehensive in the 1960s. Since the beginning of the nuclear age, there has been a gap between the positions of nuclear countries and non-nuclearized.

Regardless, Vargas's pragmatic alignment would result in inserting the country into modernity. For the United States in the post-1945, these autonomous nationalism efforts became a risk, as a stronger Brazil would not necessarily be a Brazil still aligned with the US in the nascent Cold War. The construction of an alternative power pole for Americans in Latin America was perceived with suspicion as it could affect the regional balance. It was of American interest a new political game of forces in the country, which was effected with the government of Eurico Gaspar Dutra (1946/1951).

If in the Vargas Era the first steps of modernization of the armed forces and strategic sectors were associated with bargaining, from the Dutra government and the Cold War, this view of autonomy oscillated between a nationalist and a subordinate agenda. Paradoxically, particularly close to its closure, the Dutra government developed autonomy measures, even by reorganizing internal political forces toward the nationalist agenda. If the beginning of the government is characterized by associated economic development and automatic political alignment, the end of the period brought changes.

The Dutra administration had pursued a two-track, broader policy of nuclear science and technology, due to the pressure from nationalist (Vargas-era) groups to develop a progressive and autonomous view. The emergence of the BNP is associated with the scientific-technological development and the modernization of the Armed Forces, with emphasis on the participation of the Navy. The first step was the creation in 1951 of the National Research Council (CNPq) to encourage Brazilian scientific research. Ahead of these processes, and the defense of a more active participation of Brazil in the nuclear sector, and with less asymmetries within the UN, stands out the name of Admiral Álvaro Alberto.

Admiral Álvaro Alberto defended, as Brazil's representative in the UN and in national politics, an autonomous development posture around the concept of "specific compensations": that is, fairer and more balanced agreements between non-nuclearized countries (holders of strategic resources) and the nuclearized ones (in possession of the technology). This would allow non-nuclearized nations to reap the benefits of knowledge associated with the nuclear age.

The period of the second government of Getúlio Vargas (1951/1954) was fruitful in the nuclear sector, associated with a nationalist and autonomous view. The new Vargas Era continued, in a less favorable scenario than the previous one to ISI and bargaining policies. US-Soviet Union bipolarity offered fewer alternatives than US-Germany polarization, since Americans were less willing to compromise and did not perceive the USSR as a danger to hemispheric hegemony. Vargas sought to repeat the bargain, with an alter-

native focus: opening to the nascent Third World (from Afro-Asian decolonization), and the western and eastern blocs (at least from an economic point of view). According to Visentini (2013), these multilateralization attempts had ended up being incomplete, but had opened the doors to the modifications of the following period with Juscelino Kubistchek (JK, 1956/1961) and mainly with Jânio Quadros and João Goulart (1961/1964).

Another factor of instability at this time was the polarization between nationalists and conservatives, which reached the foundations and perspectives of the development model: the nationalist ISI, with state control of strategic sectors, or US-associated development. Vargas defended the nationalist stance, see the creation of Petrobras in 1953 for oil exploration, but oscillated in other sectors, such as in the nuclear one. In 1954, it proposed the creation of Eletrobrás (Centrais Elétricas Brasileiras) in the energy sector, but only in 1961 would the company be created due to the national scenario.

A contradiction remained, as Ferreira and Lira (2016) point out: even though the country was polarized between nationalists and conservatives, there was a consensus that the country had comparative advantages in the nuclear sector and that it was a priority in science and technology. There was disagreement on how to effect the process: through nationalization and the search for external and national alternatives to the ruling powers (in particular the US) or by deepening the partnership with the Americans. For Ferreira and Lira,

From the nuclear point of view, Vargas would have the challenge of reconciling different interests, in view of the fierce debate over the best strategy for the country's development. This fact ignited civil and military tempers. Alternatives to national development diverged the role of the state and foreign capital. Also, the management of energy resources - oil and atomic ores - was also a subject of great controversy (Ferreira & Lira 2016, p. 83).

Under pressure, Vargas tried to manage the shock between these currents. On the one hand, the speech guaranteed scientific autonomy, with investments in the area, and the opening of partnerships with third countries such as West Germany, France and the United Kingdom, as pointed out by Andrade, Carpes and Leite (2017). On the other, it created mechanisms such as the Strategic Mineral Export Commission (CEME), and renewed the Military and Nuclear Agreement with the US (1952 and 1954). The combination of these agendas sought to ensure development and a certain appeasement,

It is noted that the Vargas Government's "atomic program" adopts a tripar-

tite policy: mineral prospecting, uranium industrialization and the development of nuclear technology. CNPq was charged with training specialists in the field, building infrastructure for uranium research and industrialization and obtaining raw materials. Alvaro Alberto believed that Brazil would achieve economic independence and, consequently, national security through science and nuclear energy (Ferreira & Lira 2016, p. 84).

Internal instability, Vargas' suicide, and more pro-US policy shifts lead to greater political rapprochement with the Americans in the Café Filho Interregnum (1954/1955) and the JK government. However, in JK, this approach will be nuanced in some sectors such as international relations and nuclear (Andrade, Carpes & Leite 2017, Visentini 2013).

One of the most controversial points was the agreements regarding US access to Brazilian uranium. In 1954 and 1955, the Wheat Agreement and the Atomic Agreement respectively, provided for the export of uranium to the US in exchange for wheat, without any technological counterpart. In 1956, JK, despite his adherence to the US bipolar agenda, questions this situation, and seeks concessions in this sector. Such concessions were also related to the change in US policy, which under the Eisenhower administration was embodied in the "Atoms for Peace Program." This allowed a qualitative leap in BNP.

The Atoms for Peace Program committed itself to helping partner countries to develop their nuclear projects for peaceful purposes. For Brazil, this program, combined with CNPq internal investments, led to the installation of the first nuclear reactors in the country in the cities of São Paulo (Atomic Energy Institute, IEA, today Institute for Energy and Nuclear Research / IPEN), Rio de Janeiro (Institute of Nuclear Energy, IEN) and Belo Horizonte (Center for Technological and Nuclear Development, CDTN). These reactors opened a new phase in research and scientific progress in Brazil, and in 1956 the National Nuclear Energy Commission (CNEN) was created. In the international system, the milestone was the establishment of the International Atomic Energy Agency (AEIA, 1957). BNP seemed to have found a compromise between rapprochement with the US and preserving an national development agenda.

### *B) Autonomy and National Power (1961/1989)*

In 1961, the emergence of the Independent Foreign Policy (PEI) promoted a qualitative leap in the international relations agenda by inserting a globalized perspective of projection. According to Visentini (2013), the PEI is a response to the political and economic transformations of the country, and

an intensification of the previous multilateralization tests of Vargas and JK in the South-South and South-East axes. To this contributes a complex world scenario: growing multilateralism, the real consolidation of the Third World and the Non-Aligned Movement, and the broader partnership generated by the recovery of the western and eastern blocs.

On the nuclear agenda, this will represent greater assertiveness, even in response to the start of negotiations on the first multilateral nuclear sector regimes. After the Cuban Missile Crisis (1962) between the US and the Soviet Union, which had brought the world closer to Mutual Assured Destruction (MAD), and the realization of the potential for scaling up of the “nuclear club”, the nuclearized powers started double discussions: bilateral US-USSR<sup>7</sup> to contain the arms race and multilateral to bar nuclear proliferation between nuclearized and non-nuclearized countries.

In 1963, this process gave rise to the Treaty of Partial Prohibition of Nuclear Tests (PTBT, 1963), culminating in 1967 with the Treaty on the Non-Proliferation of Nuclear Weapons (NPT, 1967, which entered into force in 1970). In 1975, complementing the concerns of the NPT, the Nuclear Suppliers Group (NSG) was created to “coordinate activities to control the export of nuclear material, equipment and technology for peaceful purposes to countries without nuclear weapons” (Duarte 2014, p. 56). Also established in 1978 was the United Nations Conference on Disarmament. Nevertheless, the mechanism of periodic reviews of the NPT was installed. In this context, it is necessary to observe the evolution of the Brazilian position regarding these events.

Although it laid the foundations for the modernization of Brazilian foreign policy, PEI will not continue in its original format since 1964. In 1964, the government of João Goulart (vice-president, he assumed after the resignation of Jânio Quadros in 1961) was overthrown by a coup. From 1964 to 1985, Brazil would be under the aegis of the Military Regime. The complexity of the Military Regime regarding the internal and external development agendas cannot be underestimated, presenting a high degree of modernity and nationalism, as Vizontini (1998) argues. In the social field, however, the predominance was that of conservatism, and the reaffirmation of the Brazilian position against the communism in the Cold War.

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<sup>7</sup> The US-USSR bilateral agreements since the 1970s include the Strategic Arms Limitation Treaty (1969/1972), Anti-Ballistic Missile Treaty (1972), Peaceful Nuclear Explosions Treaty (1976), Reach Forces Treaty Intermediate (1988), Nuclear Test Limitation Agreement (1990), Strategic Nuclear Weapons Reduction Treaty (1991), Strategic Offensive Weapons Resolution Treaty (2002), Treaty on Additional Strategic Offensive Weapons Reduction and Limitation Measures (2011). For more details see Duarte 2014.



The period from 1964 to 1985 was neither homogeneous nor free of conflict and change between governments - Castello Branco (1964/1967), Costa e Silva (1967/1969), Médici (1969/1974) Ernesto Geisel (1974/1979) and João Figueiredo (1979/1985). Such managements presented singularities, especially regarding the exchange with the US, which oscillated between the resumption of alignment (1964/1967) and different levels of approximation, distancing and shock in the post-1967, focusing on the economic technological development model and international projection. For nuclear policy, however, there was a greater convergence around nationalist principles and distancing and conflict with the Americans.

Even in Castello Branco, Brazil rejects the vision of the great powers to contain the nuclear technological development of developing countries. In the view of Brazilian diplomacy, this development is not linked to purposes of war, but to provide conditions for a leverage of knowledge. Capacity building in dual-use technologies (peaceful and warlike) is perceived as essential to progress, which is already found, as seen in the roots of BNP. Therefore, for Brazil, knowledge and technology are a function of development, not of warmongering. Advocating access to nuclear technology goes hand in hand, and is complementary to defending disarmament (such as support for the suspension of nuclear testing).

Since the presentation of the NPT<sup>8</sup>, Brazil, as well as India, has become one of its strongest opponents. After all, “(...) much more than an energy choice, nuclear is also considered a geopolitical issue of weight for the international insertion of Brazil” and India we might add (Le Prioux and Santos 2011, p. 42).

Regardless of the different regional circumstances, Brazil and India regard the nuclear factor as essential to its external action and its consolidation as powers. In general, the Brazilian regional environment presents a lower level of instability than the Indian one, more focused on competition with Argentina, and limited to a nuclear power, the US. However, the goal of gaining access to and mastery of technology not only refers to possession of the weapon as it has been emphasized, but the pursuit of prestige, knowledge, bargaining power and the strengthening of defense and deterrence mechanisms.

At the time, the INP was at a more advanced stage than the Brazilian, so much so that the country will become a nuclear weapon holder shortly after the NPT came into force. Brazil, in turn, under the military regime, will devel-

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8 Available at: <<https://www.un.org/disarmament/wmd/nuclear/npt/text>>. Acesso 05 fev. 2019

op its actions around two axes: the opposition to the NPT through diplomatic initiatives and the development of its nuclear program.

With regard to the first axis, the diplomatic initiatives, this opposition will have two tactical movements during the Costa e Silva government (1967/1969): on the one hand the denunciation of the freezing of world power (thesis defended by Ambassador Araújo Castro), represented by the NPT, since its provisions would maintain the power asymmetry between the nuclear and non-nuclear countries, defending the democratization of knowledge about sensitive technologies and, on the other hand, adherence to agreements considered non-restrictive and focusing on disarmament.

This adhesion was symbolic of the Brazilian demand for access to technology, without implying its use, and was represented by the signing, in 1969, of the Treaty of Tlatelolco (or Treaty of Nuclear Weapons Prohibition in Latin America and the Caribbean). The Treaty, as well as similar ones, establishes within the UN the concept of Nuclear Weapon Free Zones, that is, areas in which nuclear weapons would not be present through the South Atlantic Peace and Cooperation Zone (ZOPACAS)<sup>9</sup>. As indicated by Vizentini (1998),

The Costa e Silva government supported the renunciation of the use of nuclear weapons, atomic disarmament and nonproliferation, but defended the research and use of nuclear energy for economic and technological development (Vizentini 1998, p. 114).

Vizentini adds that at no time did Brazil refrain from negotiating, or integrating, nonproliferation agreements, but that Chancellor Azeredo da Silveira had as its agenda “an appropriate balance of mutual obligations and responsibilities” (Vizentini 1998, p. 115). Despite these positions, and an autonomist stance in international relations, in association with the Third World, Brazil-US exchange remained in the nuclear area, even for the ideological affinity between countries in the context of the Cold War.

Another factor supporting this stance was US policy with President Richard Nixon and National Security Adviser Henry Kissinger, who prioritized strengthening ties with regional powers considered pivots. In the case of Latin America, this power was Brazil. During the Médici government, 1969-1974, countries signed the Bilateral Scientific Cooperation Agreement

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<sup>9</sup> Other nuclear-free zones were established by the Antarctic Treaty (1961), the Outer Space Treaty (1967), the Seabed Treaty (1972), the Agreement Governing the Activities of the Moon States and Other Celestial Bodies (1984), the Rarotonga Treaty (1986), the Bangkok Treaty (1997), the Unilateral Declaration (Mongolia, 1993), the Central Asian Treaty (2006) and the Pelindaba Treaty (2009). Recommended Duarte 2014.

(1971), the Military Assistance Agreement (1972) and the Pacific Nuclear Energy Cooperation Agreement (1972). These agreements proved essential for the installation of Angra I, Brazil's first nuclear power plant, supported by White Westinghouse.

However, this nuclear policy scenario had changed in the Geisel government as part of a comprehensive security nationalization project (Cervo and Bueno 2008). According to the authors, this project was aimed at increasing public investments in the field of security, focusing on the development of cutting-edge technology, with a view to strengthening Brazilian autonomy and its global role. Nuclear power was an essential part of this two-dimensional program: the establishment of the Nuclear Agreement with West Germany (1975) and the parallel nuclear program, based on the full development of the nuclear fuel cycle and nuclear submarine construction<sup>10</sup>. According to Brick and Junior (2018), historically it is necessary to highlight the strong interdependence between the PROSUB (Submarine Development Program) and the Navy Nuclear Program, which consist of essential public policies of national defense.

Since 1969, Brazil and Germany already had a Scientific and Technological Cooperation Agreement<sup>11</sup> and this would facilitate the new negotiations. The nuclear deal with West Germany represented a renewed bargain in the bilateral partnership and an attempt to elevate the power of both nations at a time of transformation of their relative positions and the international system. The provisions of the agreement involved the implementation of eight nuclear power plants, cooperation for the exploration and treatment of uranium (and enrichment), the production of nuclear reactors, facilities and components, the production of irradiated elements and the reprocessing of nuclear fuel. According to Wrobel (1996), technology transfer was one of the main attractions of the agreement, but also one of its problems as it did not extend to all sectors. In 1974, *Nuclebrás Equipamentos Pesados S.A* (Nuclep) was created to replace CBTN, as well as a complex organ system to advise BNP.

One of the government's arguments for internalizing and nationalizing these processes, and for breaking the traditional partnership with the US, was precisely the question of autonomy and technological knowledge. The relationship with the US was perceived as uneven and conditional on US

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<sup>10</sup> The other items were the development of the national war industry with the companies Specialized Engineers S.A (ENGESA) and Avibras Space Industry, the Informatics Policy (1976).

<sup>11</sup> In addition to West Germany, France and Iraq were the focus of Brazilian cooperation in the nuclear area.

interests, especially in the field of technology transfer. In addition, Geisel's new foreign policy agenda, Responsible and Ecumenical Pragmatism, was characterized by an acceleration and deepening of the country's multilateral and global relations, free of ideological compromises.

During the process, the US-Brazil Military Agreement was broken in 1977. This generated a natural detachment, which was increased in proportion to the gains in national power. The country has taken a more "demanding" stance regarding its interests, such as the defense of the Brazilian territorial sea (200 miles). For Americans, who from 1976/1977 would also undergo a change in their foreign policy, this resettlement was not perceived as positive.

The rise of Jimmy Carter (1977/1980) would mean that this Brazilian posture of autonomy and other middle powers would no longer be accommodated but contained. To this end, Carter and his successor, Ronald Reagan (1981/1988), impose sanctions and restrictions on the governments in question. In Carter, the human rights and pro-democracy agenda was combined with a speech of peace and interdependence, which was evaluated as an action of interference and restriction of the Brazilian projection. This accelerates already ongoing processes of universalization of international relations and culminates in the denunciation of the Military Agreement. With Reagan, we highlight the restriction of Brazilian access to cutting-edge technologies and strategic materials for the development of national programs. At the same time, trade and financial sanctions were imposed.

But what is the result of these internal and external conjunctures for Brazil in the direction of the nationalization of nuclear safety? The results are mixed: although nuclear projects have gained momentum in the military regime, their post-regime continuity has been broken, as Wrobel points out (1996). This is one of the major differences between the Brazilian and Indian programs: while the Indian trajectory is linear, without major breaks, and progressive, the Brazilian one is irregular.

Three factors stand out: the polarization of internal groups around international projection paradigms and development models, the impact of the US due to hegemonic counterreactions in the above sectors and the fragility of some of the pillars of the nuclear agenda, including partnership with the Germany. This third factor, according to Vizentini (1998, p. 226), leads to an even curious situation of diminishing US pressures on Brazil at the end of the regime, as "Most likely, the US authorities found that the delays, as well as the technical and financial problems, which were already evident, would make implementation of the Nuclear Agreement difficult and its opposition unnecessary".

According to Wrobel (1996), the partial compliance of the agreement

with Germany and the technical difficulties, generated in Brazil the need to look for alternatives. The parallel nuclear program has accelerated the process of internalization of technology and research. As a state project, the domain of the nuclear fuel cycle and the construction of the nuclear submarine<sup>12</sup> received significant attention from the last military government of João Figueiredo. In 1984, Angra I was allowed to function, and as indicated, the other processes were accelerated. Like this,

An important step in the development of these priorities was the first experiments with the ultracentrifuge capable of separating uranium in isotopic form (enrichment process) in 1982 and the mini cascades of nine centrifuge machines put into operation in 1984. The following years, until 1989, there were many delays due to the problems related to the new ultracentrifuges, but at the same time the reach of up to 5% enrichment of the national uranium (Barletta 1997), all produced by efforts of the bodies created by the Brazilian Navy: the Coordination for Special Projects (COPESP), and the Aramar Experimental Center (CEA), both in the state of São Paulo. These factors emphasized how important the development of technology was to the Brazilian government of the time. (Andrade, Carpes and Leite 2017, p. 626)

Another relevant dimension was the deepening of cooperation with Argentina since the 1980s, resulting from the rapprochement of the two countries at a time of internal and external vulnerability. Both suffered the effects of the economic crisis and the demands for political transition and moved from competition to cooperation, based on economic, political and science and technology negotiations (with confidence-building measures).

The redemocratization processes, with the New Republic of Sarney and Alfonsín in Argentina had an important legacy in this sense, which resulted in the 1990s in MERCOSUR and the Brazilian-Argentina Agency for Accounting and Control of Materials (ABACC), already in 1991, with post-Cold War context. Prior to this, Sarney inaugurated the Aramar Experimental Center in 1988, essential for Brazilian uranium enrichment research, and was created by Brazil's Nuclear Industries (INB).

However, both in Brazil and Argentina, the outlines of an internal and external agenda of breaking previous autonomy initiatives were already being drawn. The economic crisis only deepened, with high inflation, low growth and unemployment. The end of the Cold War had accelerated this process

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<sup>12</sup> For the historical process see Martins 2011, and for the evolution of the Brazilian Navy, Moura 2015

from 1989 onwards.

### *C) Retreat and Alignment (1989/1998)*

The evolution of the BNP from the 1940s on was polarized around two tactical options: the nationalist and the surrender (or associate), with different positions about the US role in the sector. But, as also presented, there was a consensus that this power reference was important and should not be abandoned. In the 1970s, the predominance of the nationalist view led to the challenge of international regimes such as the NPT, the defense of access to technology, the breaking of the alliance with the US and large state-funded projects.

However, in the 1980s, this perspective began to be challenged, claiming, in certain political sectors, that the Brazilian stance was leading the country to lose opportunities. The revision of nationalist policies and the realignment to the Americans was perceived as essential for Brazil's reintegration into the world. As Vigevani and Cepaluni (2007) indicate, the so-called "autonomy through integration" was defended, opposing it to "autonomy through exclusion". Basically, "exclusion" was meant by the broad lines that had been launched by the PEI and reinforced in the military regime, sought a position of power.

One of the biggest symbols of exclusion was, according to this argument, the refusal not to sign international regimes like the NPT, and, at the same time, the development of policies perceived as "aggressive" (that is, the nuclear program, among others). To reinsert into the world one had to readjust to a new global context that was born with the post-Cold War led by the US.

The election of Collor de Mello meant the victory of this political current, and a complete reevaluation of foreign policy, towards this "reframing". As Batista (1993) points out, the assessment that realignment would bring benefits was misguided on many levels: first, Brazil was not isolated in the international system; second, the new context was not unipolar, focused on the US, but already with a tendency to multipolarity; Third, realigning meant giving up the bargaining power the country possessed despite the economic crisis.

However, the "agenda clearing" had begun in the previous management and would only deepen with Collor. Adhering to the neoliberal agenda of the Washington Consensus, the government privatized strategic sectors, promoted economic openness and deregulation. Externally, there was an au-

tomatic alignment with the US and the abandonment of the global multilateral paradigm. The dismantling of the nuclear sector has become one of the most relevant to symbolize the new phase of an integrated and responsible Brazil. It was no longer questioning what the country's development in the sector should be like, with or without the US, but this development was abandoned as a strategic piece of international insertion.

Investments were reduced and the system restructured, and the surveys were conducted mostly with commitment from the Navy. The goal was not to abandon projects altogether, doing what was possible, even if it meant significant delays. Although it represented a cut in Collor's trajectory, the administration of Itamar Franco that took over after his impeachment can do little to recover investments in the nuclear sector. Contributing to this were the still prevailing political divisions and the economic crisis.

The slow pace remained for most of Fernando Henrique Cardoso's government (1995/2002). Only in his second term, some changes began to be felt, based on the creation of the Ministry of Defense (MD, 1999), and discussions on the establishment of a National Defense Strategy (NDT).

FHC's first mandate (1995/1998) was characterized by the maintenance of the "autonomy for integration" strategy that culminated in the signing of the NPT in 1997, which came into force in 1998 after being ratified by the National Congress. The country had already committed itself to the Missile Technology Control Regime (MTCR), supported the Comprehensive Nuclear Test Ban Treaty (CTBT) and the indefinite extension of the NPT. Likewise, it supported, from 2000, the thirteen steps to nuclear disarmament of the VI NPT Review Conference and subsequent review and review conferences.

Brazilian adherence to these regimes found a limit: the 1997 NPT Additional Protocol<sup>13</sup>. The country has not acceded to this Additional Protocol establishing additional safeguard measures to be applied to signatory states. These include AEIA unannounced (without previous warning) inspections of nuclear facilities and with full access to these facilities and their geographical surroundings. As highlighted by Silva (2010), the Protocol is considered intrusive. The implications of unrestricted opening of nuclear facilities in Brazil or any country run into questions of state sovereignty and technological mastery in sectors such as uranium enrichment. In fact, this is a subject that generates systematic US pressures and is getting worse.

This period is characterized by a strong difference between the Brazilian and Indian programs, as the nuclear dimension is no longer considered a strategic state project. As Patti (2010) points out, Brazil positioned itself

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13 Available at: <<https://www.iaea.org/topics/additional-protocol>>. Access on 01 Feb. 2019



against India at one of the moments of greatest tension in its nuclear field with the Americans, derived from the 1998 nuclear tests deepened in the pro-denuclearization field on the New Agenda Coalition (NAC) initiative. The scenario would begin to change in FHC's second mandate, resuming an assertive perspective on the agenda of Luís Inácio Lula da Silva (2003/2010).

*D) Discontinuous Autonomy (1999/2018)*

In 1999, the establishment of the MD resulted in important advances in defense and security at various levels: civil-military relations and the establishment of systematic thinking on defense and security issues. All these documents are composed of the National Defense Policy (PND)<sup>14</sup>, the National Defense Strategy (END) and the National Defense White Book (LBDN)<sup>15</sup>. The relevance of nuclear energy is present and, from the 21st century onwards, as a significant emphasis on technological mastery and sector autonomy as essential to national defense and security. The country reaffirms its peaceful vocation in the sector and its willingness to cooperate with international regimes in the nuclear field and on other weapons of mass destruction. This stance is expressed in the NDT, according to which,

The nuclear sector transcends, by its very nature, the division between development and defense. By constitutional imperative and international treaty, Brazil has been deprived of the power to use nuclear power for any purpose other than peaceful. This was done under several premises, the most important of which was the progressive nuclear disarmament of the nuclear powers. No country is more active than Brazil in the cause of nuclear disarmament. However, Brazil, by prohibiting itself from accessing nuclear weapons, should not be stripped of nuclear technology.

Therefore, in order to reaffirm its repositioning in the nuclear technology acquisition and development, Brazil

(a) [Shall] Complete, as regards the nuclear-powered submarine program, the nationalization and industrial scale development of the fuel cycle (in-

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<sup>14</sup> Previously, National Defense Policy (2005).

<sup>15</sup> In this article, the 2012 versions of END, PND and LBDN are used as reference, since the definitive documents for the 2016 updates (corresponding to the 2017/202 cycle) are not yet available. Draft updates are available on the Ministry of Defense website at: <<https://www.defesa.gov.br/noticias/29093-minutas-do-livro-branco-da-pnd-e-da-end> -are-available-for-reading>. Access on 16 nov. 2018.

cluding gasification and enrichment) and construction technology reactors for the exclusive use of Brazil; (b) accelerate the mapping, prospecting and exploitation of uranium deposits; (c) Enhance the potential to design and build nuclear thermoelectric plants, with technologies and capabilities that end up under national domination, even if developed through partnerships with states and foreign companies. Use nuclear energy carefully, and subject it to the most stringent safety and environmental protection controls, as a way to stabilize the national energy matrix, adjusting variations in the supply of renewable energy, especially energy from hydroelectric sources; and (d) Increase the ability to use nuclear power in a broad spectrum of activities. Brazil will ensure that the access to the development of its nuclear energy technologies is open. It will not adhere to additions to the Nuclear Non-Proliferation Treaty aimed at extending Treaty restrictions without the nuclear powers having significantly advanced the Treaty's central premise: their own nuclear disarmament. (Brazil 2012, p. 23-24)

As indicated by Martins and Nunes (2007), the resumption of the nuclear program is part of the strengthening of the Industrial Defense Base (IDB). According to Brick and Junior (2018), this process intensifies from 2003 with the coming to power of Luis Inácio Lula da Silva (2003/2010). Supported by a favorable economic situation, the government expanded defense sector financing, both conventionally and nuclearly. A similar argument is presented by Herz, Dawood and Lage (2018), indicating the resumption of the security-development nexus, with the nuclear sector as one of its pillars. As highlighted by Andrade, Carpes and Leite,

In Luis Inácio Lula da Silva's government (2003-2010), there is the resumption of the Brazilian Nuclear Program (BNP), which begins with the revision of the existing program and the confirmation of its original objectives, namely: the construction of the nuclear submarine and the inauguration of the commercial uranium enrichment plant. In this context, the BNP was reinstated as a state policy precisely to ensure its continuity and its budget. Also at the domestic level, part of the arguments for the resumption of the program was the diversification of the national energy matrix from the use of energy considered clean from the point of view of CO<sub>2</sub> emissions. In terms of foreign policy, it is worth noting that the motivations for the resumption of the program revolved around the theme of autonomy in science, technology and innovation in strategic areas that could confer international prestige to the country and demonstrate its maturity in high complexity issues. (Andrade, Carpes & Leite p. 627-628)

According to Andrade, Carpes and Leite, there is a strengthening of interdependence between the activities of the Ministry of Defense, the Ministry

of Science, Technology and Innovation and the Ministry of Mines and Energy. There is an increase in investments. At the same time, Brazil is developing a diversified diplomacy that is recovering, alongside the theme of development and the South-South Cooperation (SSC) agenda. This profile of international relations, defined as that of a “haughty and active” foreign policy by Foreign Minister Celso Amorim (2015), aimed at the diversification of partnerships.

In this diversification, the creation of the Union of South American Nations (UNASUR) and the South American Defense Council (CDS), the IBSA (or G-3, India, Brazil and South Africa) multilateral coalitions of the BRICS (Brazil, Russia, India, China and South Africa) are some examples of initiatives of this autonomy. In addition, they were representative of a process of global power deconcentration and 21st century multipolarity trends. In two of these coalitions, IBSA and BRICS, Brazil and India approached each other in a strategic way, which could suggest an expansion of cooperation in the nuclear arena.

However, this sector, in both IBSA and BRICS (Herz and Lage 2011), did not represent a preferred negotiating issue among emerging countries for the formation of a common front on sensitive proliferation issues and multilateral negotiations. Although politically the proposals converged towards democratizing scientific-technological knowledge, criticizing the difference in treatment and asymmetries between nuclearized and non-nuclearized powers (BRICS) and there were joint military exercises between members (IBSA), the focus of these coalitions was to if on other topics. Reforming political governance and the international financial system, and advocating for new development models, had a higher priority.

The different regional conditions in Eurasia and South America, and referring to the US military presence in these spaces, imply diverse geopolitical calculations among coalition members. There was a greater reinforcement of bilateral security and defense partnerships, such as the Sino-Russian agenda, than under BRICS and IBSA. The BNP stage compared to other programs, Brazil's position on nuclear regimes and the fact that it is not a nuclear power, and its emphasis on non-military power are also components that minimize potential partnerships. In the Brazilian case, nuclear energy, diplomacy and strategy have moved together in this period in ways other than the path of variable geometry alliances: Brazil's relationship with the NPT Additional Protocols and the pursuit of diplomatic leadership in the negotiation of the Iran-Brazil-Turkey Tripartite Nuclear Agreement 2010.

In the diplomatic-strategic field, Brazil objects to the addition of new controls beyond the NPT to non-nuclearized countries. As can be seen from the set of defense documents, including the passage of the mentioned END,

the Brazilian commitment to peace and disarmament are clear, and do not mean giving up scientific-technological development. This development is the second motivation: the preservation of Brazilian sovereignty in one of the pillars of BNP, that of uranium enrichment. Despite the delays of the 1990s and the attempt to deplete BNP, as mentioned, Navy efforts have kept some of the scientific-technological research going on.

Since 2006, it has been operating in Resende (RJ), the uranium enrichment process developed with national technology by the Navy Technological Center in São Paulo (CTMSP) and IPEN based on the ultracentrifugation method. It is not appropriate here to go into the details of the process<sup>16</sup>, but to highlight the core of the controversy: Brazil does not allow access to the enriched uranium production sectors (the modules in which the uranium enriching waterfalls operate), since in these places it finds the technology developed by the country that is considered, within the ultracentrifugation process, one of the most efficient. Brazil operates with other comparative advantages in the sector, with the possession of uranium reserves among the ten largest in the world. According to OECD data, in terms of reserves exploitation, the country fluctuates between 7th and 8th position, but in terms of presumed resources to be exploited, it could even be in 4th position<sup>17</sup>.

Brazil has the resources, such as the technological capacity to become autonomous in the nuclear fuel sector. It should be remembered that nuclear fuel is necessary for the operation of nuclear power plants, and many nations do not autonomously meet their demands and need to import this fuel. As argued by Le Prioux and Santos (2011), Brazil could become a relevant player in the export market of this fuel since the “nuclear club” in this sector is very restricted. Apart from Brazil, only China, the USA, France, Japan, Russia, Germany, the United Kingdom, Netherlands, India, Pakistan and Iran have similar knowledge (besides possibly North Korea). Brazil’s strategic repositioning in the sector would have implications for the Americans and other nations, favoring the gain of national power.

By way of example, one of the biggest critics of Brazil’s position is the US, which according to US Energy Information Administration (EIA<sup>18</sup>) imports 93% of the uranium it needs to power its plants. In 2004, the Americans presented open criticism to Brazil for its decision not to allow access

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<sup>16</sup> For this, it is recommended the INB website available at <http://www.inb.gov.br/>. The previously applied method, which is in the deactivation phase, was the gas diffusion plants.

<sup>17</sup> Available at: <[https://read.oecd-ilibrary.org/nuclear-energy/uranium-2018\\_uranium-2018-en#page1](https://read.oecd-ilibrary.org/nuclear-energy/uranium-2018_uranium-2018-en#page1)>. Access on feb. 05, 2019.

<sup>18</sup> Available at: <[https://www.eia.gov/energyexplained/index.php?page=nuclear\\_where](https://www.eia.gov/energyexplained/index.php?page=nuclear_where)>. Access on feb. 05, 2019

to Resende's facilities and for not signing the Additional Protocol. According to Patti (2010), one of George W. Bush's senior administration advisers (2001/2008), Brent Scowcroft, compared Brazil to Iran in a Washington Post article. According to Scowcroft, in a position rejected by the then Minister Celso Amorim, Brazil could become a nuclear power, developing war activities. Patti (2010) indicates that these tensions could be resolved at that time but remain an unresolved issue.

For Stuenkel (2010), these attitudes of emerging nations call into question their commitment to international regimes. This perspective is based on the idea of "isolation versus integration" as a product of Brazil's and India's foreign policy actions vis-à-vis the US and international organizations, rather than their strategic calculations. There is a permanence of a difference in treatment between the nuclearized and non-nuclearized nations and between the developing and developed nations (remembering also that between Brazil and India there is the non-nuclearized and nuclearized difference).

The second point of confrontation between the USA and Brazil in the nuclear field in the Lula period relates to the Brazil-Iran-Turkey Tripartite Agreement (2010). The negotiation of the Agreement refers to the pursuit of diplomatic leadership in the nuclear sector and the consolidation of Turkey and Brazil's position as regional pivots capable of leading a sensitive strategic issue, without the direct presence of the great Western powers. For Brazil, the episode was part of a resumption of the autonomist perspective of foreign policy.

In his 2015 work, *Tehran, Ramalá and Doha: Memories of Active and Haughty Foreign Policy*, Amorim recovers the talks that led to the Accord, including the initial US movement to support the Turkish-Brazilian initiative. In the assessment of the then Obama administration (2009/2016), the US-European-sponsored diplomatic path had run out and new possibilities had to be explored. In this context, the Americans supported the Brazilian-Turkish actions, although they later did not support the Tripartite Agreement and made efforts to make it unfeasible<sup>19</sup>.

In 2010, the issue assumed a significant proportion in Brazil, in a polarized scenario of presidential elections between PT (Worker's Party) candidate, Dilma Rousseff, continuity representative and José Serra of the Brazilian Social Democracy Party (PSDB). The issue, along with human rights issues also involving Iran, has intensified the already significant opposition of some groups to the country's international relations. This divergence referred to the

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19 In 2015, the Joint Global Action Plan was signed between Iran, Germany and the five permanent members of the United Nations Security Council. In 2018, Trump withdrew US from this nuclear deal.

historical core of the polarizations between international insertion paradigms and development models. Not even the disclosure of documents by the Brazilian government that the Americans supported the negotiation was sufficient.

Although the Obama administration has officially advocated for a world in which emerging countries were more prominent under the 2010 National Security Strategy (WHITE HOUSE, 2010), practical movements have alternated pressures with engagement actions to bring them closer to USA. The Nuclear Agreement with India is one such example of engagement to bring an emerging country closer to the US on the one hand, and to contain its expansion and rapprochement in alliances of varying geometry.

From 2011 onwards, the recovery of the US economy expanded the containment of emerging countries from a strategic and economic-political point of view. The stalling of multilateral negotiations at the UN and the Trade Organization, criticism of variable geometry alliances such as the BRICS and IBSA, and the alleged imperialism of Brazil and China in regions such as the African continent, the increased military projection in Eurasia and South Atlantic and investments in regime change tactics and hybrid wars made up this offensive.

Internally, continuity turned out to be more rhetorical than practical. Even before taking office in his first mandate (2011/2014), Rousseff signaled that she would make adjustments to some foreign policy agendas. Among these, the bilateral relationship with the US and human rights, which were among the most criticized of the Lula administration. Obama's visit to Brazil in March 2011, and the deepening of global dialogues characterized this visit, indicating a greater desire for rapprochement. In 2013, the NSA's espionage crisis and the cancellation of Rousseff's visit to the US brought a cycle of crises. This cycle would be exceeded only in 2014, already in Rousseff's second mandate, which would end in 2016 with her impeachment process. In January 2016, Brazil-US signed a new Military Agreement, after the 1997 breach, which aims to resume closer cooperation in the area of security and defense (including technologically sensitive sectors such as aerospace, nuclear and joint military operation in Latin America).

For the BNP and the security and defense sector, the Rousseff period was one of fluctuations, due to these adjustments and the economic slowdown. The expectation that there could be a linear trajectory in the BNP was broken, and investments became scarce delaying the ongoing projects once again. The difficulty of building internal consensus on nuclear power and Brazilian scientific, technological and diplomatic leadership also acted negatively.

Despite investment cuts and delays, the processes that led to the mas-

tery of the complete nuclear fuel cycle, associated with Aramar and Resende's research and activities, and the continuation of PROSUB, with its consolidation with new agreements with France (the one from 2005 providing for French aid for non-nuclear submarine construction and technology transfer). In 2012, the Amazon Blue Defense Technology (Amazul) was established. On the other hand, the negative events, which added to the cut in resources, involved the inclusion of BNP in "Operation Lava Jato" to fight corruption. In 2015, Angra 3's completion works were halted.

Rousseff's departure from Presidency in 2017, and the inauguration of Michel Temer (2016/2018) was accompanied by mixed signals for the BNP. In 2017, the Brazilian Nuclear Program Development Committee (CDPNB) was reestablished and investments for PROSUB and uranium enrichment were recovered. INB's 2018 forecasts indicate that if there are no further setbacks Brazil could become autonomous in nuclear fuel production by 2033.

If the above facts can be seen as positive, others indicate the opposite situation: the Ministry of Science, Technology and Innovations was transformed into the Ministry of Science, Technology, Innovations and Communications (MCTIC) from 2017, with a significant and progressive cut of resources for science, technology, and innovation (which also affects the federal university public system in undergraduate and graduate education and research). The defense budget in general, and not just the BNP, is part of this reduction process. Additionally, there is a change in the perception of the relevance of the country to maintain its sovereignty and autonomy in strategic sectors and the role it should play in the world.

Temer's foreign policy represented a new change in international relations, accentuating the rapprochement with the US and regaining visions closer to the 1990s agendas with Fernando Collor and FHC. In an updated version of "autonomy for integration," Temer sought to reactivate a policy that prioritizes bilateralism and commercialism, with a less assertive and more pragmatic content. Brazil continues to miss opportunities to solidify its defense and enhance its participation in the international system through nuclear technology, wasting comparative advantages. Among these, as Le Prioux and Santos maintain, the country would have

(...) at least four options in its international action through the nuclear sector. (...) By itself, Brazil can become an exporter of raw uranium (option 1). In addition, the country dominates the complete nuclear fuel cycle, including the enrichment phase (...) If uranium enrichment is done on an industrial scale, Brazil can also become a major supplier of enriched uranium for the rest of the world (option 2). Another option raised by the sector is the



export of equipment and modules for external reactors (option 3) (...) A final choice would be to promote technical cooperation with South American countries (option 4) that already have experience in the area (Argentina) in order to spread nuclear energy through reactors built in South America to neighbors without such technology. (Le Prioux and Santos 2011, p. 42)

The signing of the NPT as a “form of inclusion” and other concessions has not been recognized in the international community as an act of “good faith”, maintaining pressure on the country as in the case of the NPT Additional Protocol. The state project and development model continues to swing to the less autonomous and sovereign side, unlike India which has maintained its bargaining power and achieved benefits and status in the international community.

## Final Remarks

The trajectory of India and Brazil’s nuclear programs has convergences and divergences in their nature and their relationship with the US. During the Cold War, either in the early stages of their INP and BNP when the Americans still supported the developing countries agenda for the Atoms for Peace Program, as in the post-NPT period in which conflicts, disagreements, and the desire to autonomy, convergences predominated. After 1989, however, changes in Brazil’s foreign policy and the maintenance of a perspective of non-alignment in India, which were observed were divergences, and an increasing ascendancy of the US role in the country.

There is a discontinuity in the BNP, not observed in the INP, which supports a more stable standard in the sector, even achieving concessions from the Americans in the 21st century, even though it has not yet signed the NPT. Brazil, in turn, signs the NPT seeking “integration” into the international system, without any counterparts or concessions. However, it continues to be the subject of attention and controversy for its comparative advantages in the area (something India did not have), such as strategic mineral reserves.

The geopolitical conditions of projection of Brazil and India tend to affect their security and defense agenda. The fragmentation of the Eurasian scenario and the greater diversity of equally nuclearized powers is a factor that facilitates the generation of internal consensus, something that does not exist in Brazil. Brazil’s nuclear gain would be in the American hemis-

phere, to the direct detriment of US interests. In Eurasia, a nuclear India helps counteract other actors such as China and Russia, and even Pakistan.

Different internal and external conditions explain these processes of distancing and approximation of nuclear programs. Regardless of having approached the first decade of the 21st century in an unprecedented way through the IBAS and BRICS variable geometry alliances, Brazil and India still seem to follow different paths in this field. In this case, IBSA contemplated cooperation initiatives in the military and strategic area that could have advanced. However, Brazil's oscillations prevent this assertiveness and continuity, while India seems to better manage its nuclear bargaining power and priorities.

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## ABSTRACT

The knowledge regarding nuclear technology represented a new reality for the generation of energy and international security. The nuclear attacks of Hiroshima and Nagasaki in 1945 represented the beginning of the so-called nuclear era and of the “balance of terror” as presented by many analysts such as Raymond Aron, deepened by the arms race in the US-Soviet bipolarity after 1947. Besides the superpowers, different countries had begun to develop their nuclear programs. The cases of Brazil and India stand out, since they develop their research agendas in the 1950s and 1960s, in the Cold War context, as a path to enhance their autonomy and bargaining power. The spread of the nuclear knowledge represented a challenge for the superpowers, and the talks for mechanisms of nuclear proliferation control such as the Non-Proliferation Treaty (NPT) started. This is the context in which Brazil and India develop their nuclear programs under the impact of its bilateral relations with the US. Although, these programs were convergent at first, in the search for nuclear autonomy, adjustments are going to be observed on both policies after the end of the Cold War. The article aims to understand the importance and history of Brazil and India nuclear programs and US weight on these agendas.

## KEYWORDS

Nuclear Policy; International Security; Brazilian Foreign Policy; Indian Foreign Policy; Brazil-India Relations.

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