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# Achieving nuclear zero: Brazil's contribution to the international efforts against nuclear weapons

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## About the Author

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## Abstract

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This article takes stock of Brazil's contribution to the international nuclear order, describing and explaining recent actions taken by the country regarding non-proliferation and disarmament. Drawing on Brazil's past and current nuclear policies, this analysis also puts forward a set of policy recommendations that seek to deepen the contributions to the global efforts made thus far. The underlying assumption of this work is that Brazil should not be satisfied with the role of a "moralizing spectator", it should try to take the center stage and sponsor new initiatives to improve the international non-proliferation and disarmament regime.

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## 1. Introduction

Anyone who follows international affairs knows about the nuclear “haves” and the “have-nots”; that is, the few countries that possess nuclear arms and all the others that do not own this kind of weapon. It is common to assert that the Treaty on the Non-Proliferation of Nuclear Weapons, known as the NPT, is the main reason behind the persistence of this division over the last four decades. A Nuclear Weapon State (NWS) is defined in the treaty as “one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January, 1967” (art. IX, Treaty on the Non-Proliferation of Nuclear Weapons, 1968). Of all the countries that have adhered to the NPT, only the U.S, Russia, the U.K, France and China qualify as *de jure* NWS.<sup>1</sup> The other 185 states parties are considered Non-Nuclear Weapon states (NNWS) and have vowed not to use nuclear technology for weapons purposes.<sup>2</sup>

The definitions of NWS and consequently of NNWS seem to corroborate the argument of nuclear “haves” and nuclear “have-nots” as well as the view of the NPT as a perpetuator of a discriminatory order. However, that classification can be misleading, giving the impression that five countries are standing on one side while 185 states are on the other. In reality, this division is a little less uneven, since military alliances and security assurances have placed a number of NNWS under the “nuclear umbrella” of nuclear-armed states. Thus, the real split is between countries that consider nuclear weapons to be crucial for their security (including the nuclear-armed countries and others standing under their umbrella, e.g. Turkey, Japan, South Korea, Poland, Czech Republic) and countries that do not regard nuclear weapons as essential to their security.

All of the countries that are a part of the latter group have abided by the NPT and complied with the obligation not to proliferate.<sup>3</sup> In turn, they expected the NWS to do their share of the deal and, in accordance with article VI of the Treaty, to pursue negotiations “in good faith” on measures to cease the nuclear arms race and on a disarmament treaty (Treaty on the Non-Proliferation of Nuclear Weapons, 1968). While the end of the nuclear arms race became a possibility after the Cold War period, there have been no indications that serious disarmament negotiations will take place any time soon.

Decades have gone by without the NWS being able to negotiate a framework for total disarmament or even discuss the details of such process. Although it is true that the nuclear stockpiles have been reduced in absolute numbers,<sup>4</sup> this has not occurred as a consequence of multilateral arrangements, but rather because of unilateral decisions or bilateral agreements between the U.S. and Russia. Additionally, all NWS have undertaken modernization activities to improve their weapons systems, contradicting and undermining their stated goal of disarmament.<sup>5</sup>

Brazil is a latecomer to the NPT, having ratified the treaty in 1998. Since then, it has been among the most critic members of the regime, constantly maintaining an assertive position in favor of nuclear disarmament. As a representative

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<sup>1</sup> As opposed to India, Israel, Pakistan and the Democratic People's Republic of Korea (DPRK) – which are not part of the NPT and, thus, are considered *de facto* NWS.

<sup>2</sup> As of March 2015, the United Nations Office for Disarmament Affairs (UNODA) database registers 191 states parties to the NPT, including the DPRK. Although there are divergent views as to whether North Korea is still a party to the NPT, this paper will not include it among the member states. Hence, the total number of NPT states parties considered here is 190 (5 NWS and 185 NNWS).

<sup>3</sup> India, Israel, Pakistan never signed the NPT and the DPRK pulled out of the treaty, in 2003, invoking the withdrawal clause.

<sup>4</sup> According to *The Bulletin of the Atomic Scientists* Nuclear Notebook (2015), there were more than 64,000 nuclear warheads at the apex of the nuclear arms race in 1986. Currently, the global nuclear stockpile is estimated in more than 16,000 warheads (Norris and Kristensen, 2014a).

<sup>5</sup> For an overview of the recent modernization efforts undertaken by all nine countries that have nuclear weapons, see Norris and Kristensen, 2014b.

of the group of countries that do not rely on nuclear weapons for their security, Brazil has put forward important initiatives, which contributed to global nuclear disarmament, such as:

- » Placing its nuclear activities under international safeguards;
- » Being part of the Nuclear-Weapon-Free Zone of Latin America and the Caribbean;
- » Joining forces with like-minded countries and creating the New Agenda Coalition;
- » Taking part in the recent international initiative to address the humanitarian impact of nuclear weapons.

The following sections will examine these pathways taken by Brazil and their impact on the global nuclear order. Additionally, this analysis will propose policy recommendations that seek to expand and deepen the contributions made so far.

The central premise of this paper is that Brazil can constructively influence the NPT regime in the short term, by upholding some of its past lines of action and by pursuing new options as well.<sup>6</sup> In any case, Brazil should not be satisfied with the role of a “moralizing spectator” (Nystuen and Lothe Eide, 2013), it should in fact try to take the center stage.

## 2. Brazil’s contribution to nuclear zero

### a) Safeguards and non-proliferation assurances

Long before it became a part of the NPT, Brazil had conducted research on all phases of nuclear energy production with varying degrees of success – such was the case of research on reactors for naval propulsion and on nuclear explosives. Most of these projects were set up in the 1970s and carried out throughout the 1980s, when the country was under a military dictatorship. These activities were organized in two nuclear programs, the civilian one and the so-called “autonomous” or “parallel” program, which was run by different branches of the armed forces. As opposed to the civilian branch, the parallel program was conducted in a covert manner and, needless to say, its activities were not under international safeguards.

Through the autonomous/parallel program, Brazil achieved uranium enrichment capacity – a fact that was made public in 1987, amid the political transition to democracy (Presidência da República, 1987). In that same period, Brazil and Argentina began to intensify high-level exchanges on nuclear matters, paving the way for a system of mutual inspections. After several joint statements about the peaceful purposes of their nuclear activities, Brazil and Argentina issued the Declaration of Common Nuclear Policy, in 1990. This document established the Common System for Accountability and Control (SCCC) to coordinate reciprocal inspections of nuclear facilities. Additionally, it expressed both countries’ willingness to commence negotiations with the International Atomic Energy Agency (IAEA) on the application of nuclear safeguards (Declaração de Política Nuclear Comum, 1990).

To run the SCCC, the two countries created in 1991 the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). Soon afterwards, an agreement was established among Brazil, Argentina, the ABACC and the IAEA, which put all nuclear material and nuclear facilities in both countries under comprehensive safeguards. Known as the Quadripartite Agreement (INFCIRC/435), it came into force in 1994 and remains valid up to today.

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<sup>6</sup> While this article will focus mainly on the ideas that Brazil has already tried to implement, a second paper will explore bolder options that Brazil could pursue to break the disarmament deadlock. See Dalaqua, 2015.

By the terms of the arrangement, Brazil and Argentina had to declare all its nuclear facilities, providing Design Information (DI) and the records of all nuclear material. The agreement recognized the SCCC and mandated both the ABACC and the IAEA to verify the information provided by Argentina and Brazil. The two agencies were to conduct joint inspections in both countries, drawing their conclusions independently.

Putting an end to covert nuclear activities and opening up to international safeguards was crucial to overcome suspicions regarding Brazil's nuclear intentions. Another important step in this process was the ratification of the NPT in 1998, which also includes IAEA's safeguards among its obligations. Although safeguards are often considered as a non-proliferation measure, they are relevant to disarmament too. After all, credible safeguards systems help to create an environment conducive to cooperation on nuclear reductions and disarmament.

Currently there are 27 nuclear facilities in Brazil - all under safeguards (ABACC, 2013).<sup>7</sup> This number includes the technological center of the Navy, which is in charge of the construction of a reactor for naval propulsion, to be used in a submarine. If successful in this project, Brazil will become the first NNWS to produce a nuclear-propelled submarine. Since there is no precedent for such a case, this will represent new challenges to safeguards, inspections, monitoring and verification.

As a NNWS party to the NPT, Brazil has the right to develop and use nuclear technology for naval propulsion. From the perspective of the regime, nuclear propulsion does not constitute proliferation, since the NPT has not prohibited it and the model safeguards agreement of the IAEA allows the states to use nuclear material in a "non-proscribed military activity". In this case, the standard IAEA comprehensive safeguards agreement (INFCIRC/153) permits the withdrawal of nuclear material from safeguards, provided that "during the period of non-application of safeguards the nuclear material will not be used for the production of nuclear weapons or other nuclear explosive devices" (IAEA, 1972).

For decades, analysts have criticized this aspect of the regime, arguing that withdrawing nuclear material from safeguards to use it in a military propulsion program increases the risk of proliferation (Desjardins and Rauf, 1988). Some have even expressed concern over an alleged threat of a new global arms race in nuclear submarines (Moltz, 1998).

In fact, a submarine reactor can run on low-enriched uranium (LEU) - enriched up to 19.9 percent - or highly enriched uranium (HEU) - uranium enriched to at least 20 percent. Among the countries that possess nuclear submarines, France and China reportedly use LEU while the U.S, the U.K, Russia, and India opted for HEU (Chunyan and von Hippel, 2001; Philippe, 2014). Affecting this decision, there are considerations in regard to core life, core size, total power and reactor safety. In addition to technical factors, there is also the political aspect of nuclear technology. If Brazil were to choose HEU, it would probably raise proliferation concerns, since this type of material is considered weapons usable.

In the course of this research, officials speaking off-the-record have stated that they expect that the submarine will run on LEU and that it will be subjected to the ABACC safeguards arrangement, as long as it does not jeopardize the submarine action. Representatives of the Brazilian nuclear sector have acknowledged that it is important to assure the non-diversion of LEU (or HEU) produced for naval propulsion reactors; that is, to be sure that nuclear material being used in naval propulsion will not be used for the production of nuclear weapons or other nuclear explosive devices. Nevertheless, the ordinary procedures are not considered to be appropriate in this case. There is a need to avoid measures deemed too intrusive or impractical and to protect military strategic data and information regarding the submarine performance.

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<sup>7</sup> The list includes one power reactor under construction (Angra 3) and three facilities still in the phase of project development.

Currently, Brazil and the ABACC are pioneering a verification process with the IAEA. The objective of developing a suitable approach to assure non-diversion in activities related to naval propulsion is already included in the IAEA's long-term R&D plan (IAEA, 2013). In the case of Brazil, this approach is likely to require the cooperation of the Navy and include special, non-intrusive procedures for critical stages of the naval fuel cycle.

#### b) Tlatelolco and beyond

Brazil is part of the Nuclear-Weapon-Free Zone (NWFZ) of Latin America and the Caribbean, the first of such regional agreements to be created. The country played a prominent role in the early conception of the NWFZ, advancing the idea at the United Nations (UN) in 1962, in the context of the Cuban missile crisis (Avila, 2012). In the years after the crisis, the treaty establishing Latin America as a militarily denuclearized zone was negotiated among the countries of the region, under the leadership of Mexico.<sup>8</sup>

During the drafting process, there were significant changes in Brazilian domestic politics, which included a military coup d'état in 1964. These developments brought consequences to the Brazilian attitude towards nuclear technology and, hence, towards this agreement. The country did not openly oppose the negotiations, but it was determined to avoid a rigorous treaty. Repeatedly, Brazil adopted an obstructionist attitude, emphasizing the need to keep its freedom of action on nuclear energy matters (Serrano, 1994).

The treaty was concluded and opened for signature in February 1967, in the Tlatelolco area of Mexico City. The final text of what is known as the Treaty of Tlatelolco determined that nuclear material and facilities be used exclusively for peaceful purposes and prohibited the test, use, production or acquisition of nuclear weapons as well as the receipt, storage, installation, deployment and any form of possession of nuclear weapons (Treaty for the Prohibition of Nuclear Weapons in Latin America, 1967).

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*The Treaty of Tlatelolco effectively brought contributions to the contracting parties, increasing confidence among the countries of the region, serving as a preventive measure of disarmament and as an instrument to demand negative security assurances from the NWS in favor of the signatories. It also served as an important example to the rest of the world, offering a model arrangement to be replicated and improved in other regions.*

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Upon Brazil and Argentina's insistence, an article was included to allow the states parties "to carry out explosions of nuclear devices for peaceful purposes" (art. 18). At that time, the so-called Peaceful Nuclear Explosions (PNE) were regarded as potentially useful in big engineering projects, involving massive earthmoving. Brazil and Argentina possessed the most advanced nuclear programs in the region and were keen on keeping this option open.

In spite of that provision, the Treaty did not establish a definition for "nuclear devices for peaceful purposes". On the other hand, it defined nuclear weapons in a very broad manner, as "any device which is capable of releasing nuclear energy in an uncontrolled manner and which has a group of characteristics that are appropriate for use for warlike purposes" (art. 5). Taking this into account, most Latin American countries believed it would be impossible to distinguish an explosion of a nuclear device for peaceful purpose from an explosion of a nuclear weapon. Nevertheless, Brazil con-

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<sup>8</sup> Up to 1990, the official title of the treaty did not include the words "and the Caribbean". This was amended in order to incorporate the English-speaking states of the Caribbean area into the zone of application of the treaty. By another amendment in 1991, all the independent states of the region became eligible to join the denuclearized zone. Before that, a political entity that had a part or whole territory under dispute between an extra-continental state and one or more Latin American state could not be admitted.

sidered that PNEs were permitted under the treaty and maintained that these might prove to be useful for its economic development (Patti, 2012; Mallea, 2012).

Brazil signed the Treaty of Tlatelolco on 9 May 1967 and deposited its ratification instrument on 29 January 1968. Sticking to article 28 of the treaty (entry into force), the country did not consider it to be in force, as the requirements listed in that article had not been met.<sup>9</sup> Argentina signed the agreement, but did not ratify it. In view of these drawbacks, most countries that ratified the treaty adopted a flexible attitude and waived the entry into force requirements. Those that did so considered the treaty valid in their territories.

Both Brazil and Argentina were under military dictatorships, reluctant to place constraints on their nuclear decisions. The two countries vied for leadership in Latin America, but their pursuit of nuclear development never led to a bilateral nuclear arms race or a PNE race (Mallea et. al., 2015). Brasilia and Buenos Aires shared common views regarding the NPT and the non-proliferation regime as a top-down imposition of the major nuclear powers at the expense of weaker nations (Mallea, 2012). They often supported each other's position in international fora and discussed nuclear policy among themselves (Fischer, 1997).

Early attempts at nuclear civilian cooperation produced little result. This changed only after a longstanding dispute over the Paraná River was settled in 1979. Thus, by mid-1980s, as the two countries returned to civilian governments, the bilateral exchanges in the nuclear area increased and the confidence-building measures deepened. In the process of creating a common nuclear policy, Brazil and Argentina addressed the issues of establishing a safeguard regime, renouncing to the possibility of PNEs and joining international non-proliferation agreements, such as the Treaty of Tlatelolco and the NPT. They signed a number of joint declarations, reaffirming the peaceful purposes of their nuclear programs. On 20 August 1991, the two countries signed the "Agreement for Exclusively Peaceful Use of Nuclear Energy", in which they also renounced testing, use, manufacture, production or acquisition of nuclear weapons, and importantly, PNEs.

In the following years, Brazil and Argentina created a bilateral nuclear agency, established a safeguards agreement with the IAEA and fully adhered to the Treaty of Tlatelolco. Argentina finally ratified this instrument on 18 January 1994 and Brazil formally waived requirements "a)" and "d)" of article 28 on 30 May 1994 (Brasil, 1994). By mid-1990s, only a handful of countries were not implementing the treaty in the region. In 2002, after Cuba ratified it, the Treaty of Tlatelolco came into full force. Since then, it has been operative in all thirty-three sovereign states of Latin America and the Caribbean.

Although the establishment of NWFZs is an action that can be taken by the states of a specific region, it usually requires the cooperation of other countries, including NWS. For instance, extra-regional states that have de jure or de facto responsibility for territories situated in the NWFZ should recognize and apply the status of denuclearization to the relevant territories. The countries that own nuclear weapons must also respect the status of denuclearization of these regions and provide negative security guarantees, vowing not to use or threaten to use nuclear weapons against the states parties of the NWFZ.

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<sup>9</sup> According to article 28 of the Treaty of Tlatelolco, the following requirements should be met so the agreement could enter into force among the States that had ratified it: a) Deposit of instrument of ratification by all states in the zone; b) Signature and ratification of Additional Protocol I (...) by all extracontinental and continental states having de jure or de facto international responsibility for territories situated in the zone; c) Signature and ratification of Additional Protocol II by all powers possessing nuclear weapons; d) Conclusion of safeguards agreements with the IAEA.



In the case of the Treaty of Tlatelolco, these demands are stated in two additional protocols, which have been endorsed by all relevant states. Nevertheless, all NWS have placed notes in their ratification instruments, pushing forward their own interpretations of these commitments. With the exception of China, which has for long adopted a policy of no-first use, the NWS commonly present in their notes scenarios under which they would have to reconsider the commitment not to use or threaten to use nuclear weapons against the Tlatelolco states parties. The nuclear-armed countries have maintained this position regarding other treaties establishing NWFZs.

Despite the difficulties in bringing the agreement into full force and the unwillingness demonstrated by some of the NWS to cooperate with the NWFZ, the Treaty of Tlatelolco effectively brought contributions to the contracting parties, increasing confidence among the countries of the region, serving as a preventive measure of disarmament and as an instrument to demand negative security assurances from the NWS in favor of the signatories. It also served as an important example to the rest of the world, offering a model arrangement to be replicated and improved in other regions.

The recognition of NWFZs as an important instrument to foster both non-proliferation and disarmament is explicit in the establishment of several of these regional agreements (see Figure 1). As a learning process, each NWFZ enforced stricter rules than the previous ones. The latest one, established by the Treaty of Semipalatinsk in Central Asia, requires that its parties accept an Additional Protocol safeguards agreement with the IAEA, the INFCIRC/540, and comply fully with the Comprehensive Nuclear Test-Ban Treaty (CTBT).

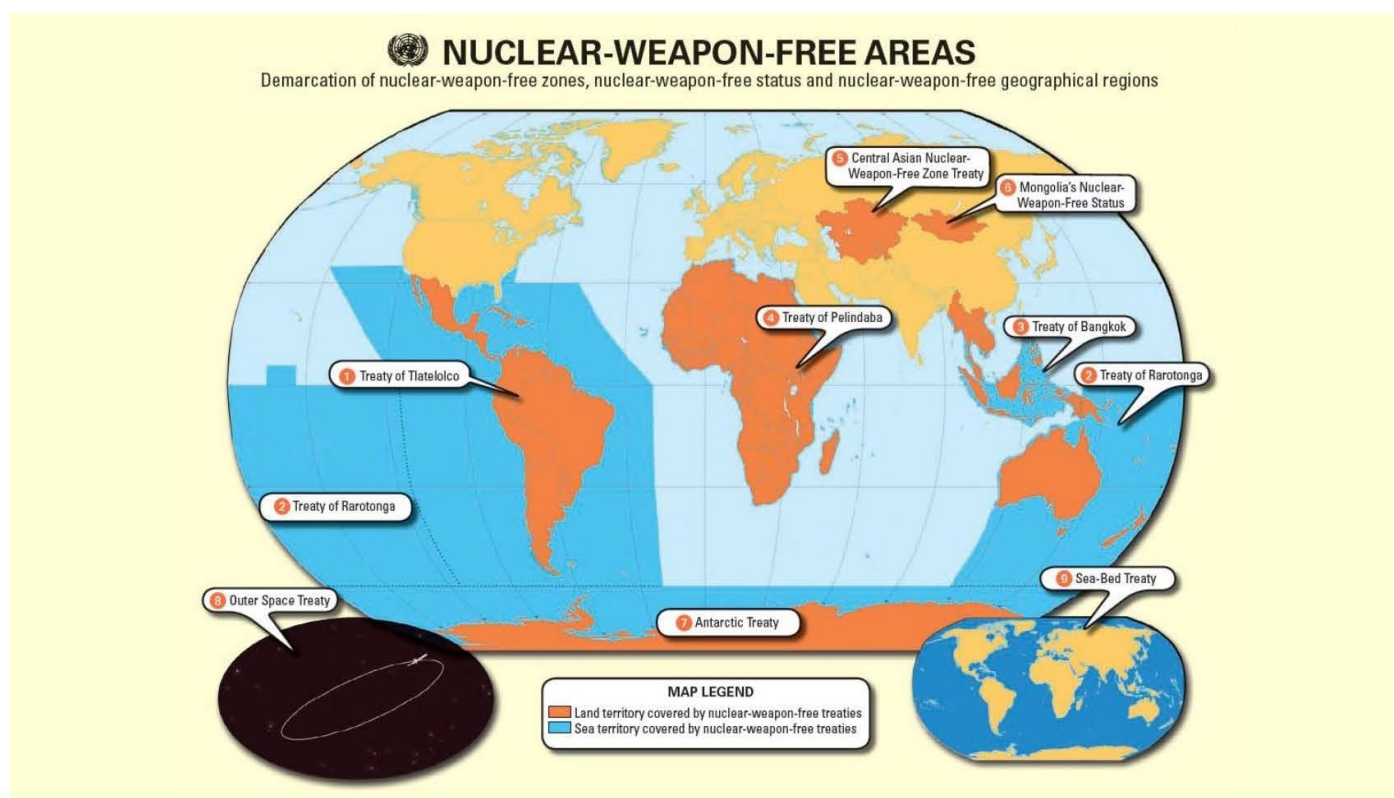


Figure 1 - Nuclear-Weapon-Free Areas  
Source: UNODA website

1. Treaty of Tlatelolco (Latin America and Caribbean, 1967)
2. Treaty of Rarotonga (South Pacific, 1985)
3. Treaty of Bangkok (South Asia, 1995)

4. Treaty of Pelindaba (Africa, 1996)
5. Treaty of Semipalatinsk (Central Asia, 2006)
6. Single-state NWFZ (Mongolia, 1992)
7. Antarctic Treaty (1959)
8. Outer Space Treaty (1967)
9. Sea-bed Treaty (1971)

All countries in the Southern Hemisphere are now in NWFZs. For a number of years Brazil and other states have been promoting the idea of a nuclear-weapon-free in the Southern Hemisphere and adjacent areas. Starting in 1986, Brazil and New Zealand have annually sponsored a resolution on this topic at the United Nations General Assembly (UNGA), gathering wide support from most UN Member States, with the exception of a few NWS – mainly, France, the U.K. and the U.S.

Regardless of the fact that the operative paragraphs of this resolution have limited practical implications – the most serious one being a request for the nuclear-armed states to sign all relevant protocols and withdraw existing reservations –, these NWS want to avoid any understanding that might consider international waters as part of a NWFZ. According to the NWS, such a hemispheric NWFZ would go against the UN Convention on the Law of the Sea, as it would legislate over international waters. The proponents of the nuclear-weapon-free Southern Hemisphere have denied these charges, arguing that the objective of this proposal is to consolidate the status of the hemisphere as a NWFZ and not to interfere on the law of the sea. Notably, the resolution in question has constantly reaffirmed the applicable principles and rules of international law relating to the maritime space, specifically mentioning the United Nations Convention on the Law of the Sea.

Another initiative taken by the states parties to NWFZs has been the organization of a conference every five-years, coinciding with the NPT revision cycle. The first one occurred in Mexico in 2005, while the second took place in New York, in 2010. A third edition is expected to take place in the context of the 2015 NPT Review Conference, in New York again. These meetings gather more than 100 countries, which issue joint declarations, reaffirming their commitments and calling on the NWS to sign all relevant protocols and withdraw any reservations or interpretive declarations contrary to the object and purpose of the treaties. This may be the beginning of a new political grouping to initiate and build political momentum for nuclear disarmament initiatives.

All these developments demonstrate the importance of NWFZs, which remind the world that nuclear disarmament is indeed possible. Thus, it is important to keep working to strengthen the existing agreements, by fixing loopholes and broadening their reach. There have been attempts to establish new NWFZs, especially in the Middle East, but talks have stalled as the political environment deteriorated in many of those countries.

### c) Joining forces with like-minded countries

In the multilateral arena, the saying “together we are stronger” is definitely true. One benefits from involving different partner-countries in its endeavors, as this can increase the chances of achieving the desired outcome. In the various disarmament settings, countries tend to gather in groups. There are at least three: a group of developed Western countries, a group of developing countries and a group of former Soviet-bloc countries.

Frequently, the group members negotiate and settle their positions and strategies among themselves before the general debate. As each of these groups includes nuclear-armed members, they usually come to a position that accommodates the interests of these countries, before engaging in the wider forum. Effectively, the group system keeps the NNWS separate, preventing them from uniting to advance their common interest.<sup>10</sup>

In this context, the creation of the New Agenda Coalition (NAC) in 1998, represented a chance for a cross-group voice in favor of disarmament. The Coalition, which includes Brazil, Egypt, Ireland, Mexico, New Zealand and South Africa,<sup>11</sup> came together with the purpose of working to fulfill the NPT and achieve its objective of a nuclear weapons free world.

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<sup>10</sup> This fact was recently pointed out by Wildfire (2014).

<sup>11</sup> Slovenia and Sweden used to be part of the NAC, but decided to leave the Coalition.

Already in its first years, it played a constructive role, acting as a mediator between the NWS and the NNWS, in particular the large body of states of the Non-Aligned Movement (NAM). The NAC was widely praised for its work in the context of the 2000 NPT Review Conference, where it pushed forward proposals to address future progress on nuclear disarmament (Johnson, 2000; Rauf, 2000). These provided the basis for the practical steps to implement article VI of the treaty, agreed by all NPT parties in the final document of the meeting (NPT Review Conference, 2000).

The NAC continued to act together in multilateral fora, such as the General Assembly's Open-Ended Working Group (OEWG) intended to develop proposals for multilateral nuclear disarmament negotiations, convened in 2013. The working paper submitted by the Coalition to the OEWG emphasized the need for an overarching, legally-binding commitment to take the required steps towards nuclear zero. The NAC argued that this commitment could come in the form of a comprehensive treaty dealing with nuclear disarmament or of a framework agreement under which other instruments would be elaborated (OEWG, 2013).

These ideas were further developed in one of the working papers that the NAC prepared for the 2014 NPT Preparatory Committee. The document on the article VI of the NPT was received as a helpful contribution, as it identified and explained four specific options for implementing the disarmament clause: (i) Nuclear Weapons Convention, (ii) Nuclear Weapons Ban Treaty, (iii) framework arrangement, (iv) hybrid arrangement (NPT Preparatory Committee, 2014). Through these innovative, yet practical, proposals, the NAC has been able to guide much of the recent talks about disarmament.

In addition to working with the NAC, Brazil was able to congregate important countries within the Nuclear Security Summit (NSS) process.<sup>12</sup> In 2014, the country took the initiative of drafting a Joint Statement on the topic of nuclear disarmament. Fourteen other NNWS endorsed the document "In larger security: a comprehensive approach to nuclear security".<sup>13</sup> The statement recommended more attention be paid to the threat posed by the existence of nuclear weapons, arguing that "as long as nuclear disarmament remains unrealized, measures aimed at comprehensively securing nuclear materials and facilities will be tinged with an undeniable degree of precariousness" (NSS, 2014). Without ignoring the importance of the summit process, the statement was a way to express concern with the narrow focus of this U.S.-led initiative.

#### d) The humanitarian approach, a change of perspective

The initiative that seeks to highlight the humanitarian impact of nuclear weapons is currently the biggest driving force behind disarmament talks, gathering an increasing number of countries, receiving support from the public and significant media coverage. While the humanitarian issue is not a new consideration in the nuclear disarmament debate, it became a strong argument inside the NPT regime over the past few years. The 2010 NPT Review Conference is commonly referred to as the starting point of this trend, as it was on that occasion that governments officially expressed their "deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons" (NPT Review Conference, 2010).

This idea continued to gain momentum, as the Red Cross/Red Crescent movement adopted a resolution on the topic, in 2011, highlighting that there is no capacity to respond to the use of nuclear weapons nor could such a capacity be

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<sup>12</sup> The first NSS was convened by the U.S. President, Barack Obama, in Washington in 2010. With the purpose of strengthening nuclear security and reducing the threat of nuclear terrorism, the meeting promoted a discussion on measures to better safeguard weapons-grade uranium and plutonium and break up nuclear black markets. A second summit was held in Seoul, Korea, in 2012 and a third one took place in The Hague, the Netherlands, in 2014. The fourth, and likely the last, edition of the NSS is expected to occur in 2016, in the U.S.

<sup>13</sup> In addition to Brazil, the document was endorsed by Algeria, Argentina, Chile, Egypt, Indonesia, Kazakhstan, Malaysia, Mexico, New Zealand, Philippines, Singapore, South Africa, Ukraine and Vietnam.

developed. The only effective preventative measure, argued the International Committee of the Red Cross (ICRC), would be the abolition of nuclear weapons (Council of Delegates of the International Red Cross and Red Crescent Movement, 2011).

During the 2012 NPT Preparatory Committee, Switzerland delivered a statement focusing on the humanitarian dimension of nuclear weapons on behalf of a group of 16 states parties (NPT Preparatory Committee, 2012). In that same year, Switzerland delivered another statement on the topic at the 67th session of the United Nations General Assembly First Committee, which was endorsed by 35 countries, including Brazil (UNGA, 2012). This kind of statement has begun to gather more and more countries: 80 states in the 2013 NPT Preparatory Committee; 125 at the 68th session of the United Nations General Assembly First Committee; 155 at the 69th session of the United Nations General Assembly First Committee.

In March 2013, Brazil took part in the Conference on the Humanitarian Impact of Nuclear Weapons, in Oslo, together with more than 120 states. A follow-up conference was organized in Nayarit, México, and it brought together representatives from 146 countries. A third one took place in Vienna, Austria, in December 2014, gathering 158 states. One of the important features of these conferences is that they circumvent the group system, bringing together all countries concerned with the negative impact of nuclear weapons. Additionally, they welcome academics and civil society participants, which often represent an extra source of expertise and energy to the multilateral process.

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*The debate on nuclear weapons and their elimination became hostage to strategic jargons and military reasoning that tends to ignore the impact that the detonation of nuclear bombs would have on people, cities and the environment. Thus, the humanitarian approach challenges the perspective of the NWS by addressing the perspective of the victims. It cuts out the distance afforded by abstract reasoning and place the concern with human suffering at the center of the debate.*

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Mostly, the NWS have refused to attend these meetings. The one exception was the Vienna Conference, when both the U.S. and the U.K. participated. Whether inside or outside the venues of the humanitarian initiative, the NWS have repeatedly expressed their dissatisfaction with this approach, which they consider a distraction from existing agreements. They have recommended that countries focus on the “step-by-step” process and devote their efforts towards the already established non-proliferation and disarmament bodies, like the Conference on Disarmament (CD) and the NPT. This suggestion ignores that it was the very frustration with this process that has prompted so many governments and civil society groups to discuss supplementary ways to implement article VI of the NPT and various UNGA resolutions; that is, the total elimination of nuclear weapons.

In this sense, the humanitarian initiative offers a fresh perspective on the issue of nuclear weapons. For sure, the horrific consequences of the use of nuclear weapons are known to humanity since the first bomb was dropped, in Hiroshima, in 1945. However, the debate on nuclear weapons and their elimination became hostage to strategic jargons and military reasoning that tends to ignore the impact that the detonation of nuclear bombs would have on people, cities and the environment. Thus, the humanitarian approach challenges the perspective of the NWS by addressing the perspective of the victims. It cuts out the distance afforded by abstract reasoning and place the concern with human suffering at the center of the debate.

This initiative follows the paths of the campaigns against landmines and cluster munitions, which also adopted a humanitarian approach. These campaigns drew on public mobilizations that are uncommon to international politics. They were not constrained by the established procedures and fora and they effectively culminated on legally binding

treaties prohibiting those types of weapons. The Mine Ban Treaty was opened to signature in 1997 and entered into force in 1999.<sup>14</sup> The Convention on Cluster Munitions was opened to signature in 2008 and entered into force in 2010.<sup>15</sup> These are successful examples of non-traditional diplomatic processes, which have inspired the current movement on the humanitarian consequences of nuclear weapons.

### 3. Conclusions

This paper has examined Brazil's major contributions to nuclear disarmament, mostly achieved through constructive diplomacy and responsible management of nuclear activities. While these actions are worth praising, they do not mean that Brazil should not undertake additional efforts. As long as nuclear weapons exist, there is still work to be done.

In view of this, the article proposes eight concrete recommendations, which are laid out below. These are actions that can be attained in the short term and do not require major shifts of direction in current Brazilian policies. They draw on Brazil's past experience with nuclear foreign policy with the view to better equip the country to meet the challenges of the twenty-first century.

#### Policy Recommendations

##### 1. *Submarine Safeguards*

It is important that Brazil continue to cooperate with the ABACC and the IAEA, complying with current safeguards procedures and setting up a solid precedent for the naval nuclear fuel cycle, one that can serve as a model for NNWS which wish to follow the same path. Balancing the need for effective verification and the preservation of classified national security information, the ABACC and the IAEA should develop procedures to effectively address the issue of non-diversion. Therefore, NPT states parties must be able to maintain confidence that unsafeguarded fissile material will not be used in a weapons program.

##### 2. *Stick to LEU for Naval Nuclear Propulsion*

Even though the decision on which type of fuel to use in the submarine lies solely with Brazil, decision-makers should not ignore the international consequences of this choice. There are several international initiatives that seek to limit the production of HEU and promote stricter controls on this type of material, which are considered important steps on the way to nuclear zero. If disarmament is ever to be achieved, countries will have to deal with their reserves of HEU and plutonium, securing them, placing them under international monitoring and, to the extent possible, eliminating them. At the moment, this would not be an issue for Brazil, since the stocks of plutonium and HEU in the country are considered insignificant. It would be better if this continues to be the case. Since there is no technical requirement to use HEU for the naval reactor, Brazil should opt for LEU.

##### 3. *Review Article 18 of the Tlatelolco Treaty*

Now that Brazil and Argentina have renounced to PNEs and signed the CTBT, article 18 of the Treaty of Tlatelolco ("Explosions for Peaceful Purposes") has become irrelevant for them - and for all the other 31 states parties that have also ratified the CTBT.<sup>16</sup> Noting this fact, the General Secretariat of the Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (OPANAL) distributed a memorandum, in 2010, recommending that article 18 be studied and reviewed. Such a review process could represent a chance to update and strengthen the Tlatelolco regime,

<sup>14</sup> To date, 162 countries are states parties to the Mine Ban Treaty.

<sup>15</sup> Currently, the Convention on Cluster Munitions counts 84 member states.

<sup>16</sup> Cuba and Dominica are the only countries of the region that have not adhered to the CTBT.

since, unlike in the 1960s, PNEs are no longer considered useful in civilian enterprises. Thus, Brazil should encourage the current Secretary-General of the OPANAL to revitalize these efforts, consulting with states parties about the possibility of amending the Treaty, eventually eliminating or revoking article 18.

#### *4. Step up Nuclear-Weapons-Free Zones group identity*

Brazil could make efforts to consolidate the identity of NWFZs states parties as a political group. As such, they could act together in non-proliferation and disarmament issues, reminding the world that it is possible for countries to address security concerns without nuclear arsenals. As a unity, comprising more than one hundred countries from different regions, the members of NWFZs could exert pressure on the NWS to follow suit and fulfill their disarmament obligations. There are certainly alternative ways to ensure stability and security other than clinging to nuclear weapons.

#### *5. Rethink Alliances*

Together with other concerned countries, Brazil should rethink its alliances inside relevant disarmament fora with the purpose of maintaining consistent associations. For instance, in the context of the Conference on Disarmament (CD), Brazil is part of the G21, which includes countries that share a common understanding that nuclear weapons are not crucial for national security, such as Egypt, Indonesia, Kenya, Malaysia, Mexico, South Africa. On the other hand, countries with nuclear weapons that benefit from the continuing paralysis of the CD<sup>17</sup> are also part of the G21, namely: North Korea, India and Pakistan. In a sense, countries that are committed to disarmament are shielding the nuclear-armed states. A more coherent policy of alliances would seek to avoid such incongruous situations.

#### *6. Reinforce the NAC*

In its seventeen years of existence, the NAC has gained credibility as a serious advocate of nuclear disarmament and a constructive player in the multilateral arena. Although two countries have left the Coalition - mostly due to domestic political dynamics - this has not affected NAC's reputation or its ability to engage with the larger group of NNWS. Undoubtedly, the NAC's performance has had ups and downs, but it seems to be at a high point right now, when the disarmament scene has been revitalized by the international debate on the humanitarian impact of nuclear weapons. There are many indications that 2015 could be a big year to push for disarmament efforts, in view of the opportunities presented by the NPT Review Conference, as well as the 70th anniversary of the atomic bombings of Hiroshima and Nagasaki and the 70th anniversary of the United Nations. Brazil and the NAC should make the most out of this combination of events, increasing coordination among the Coalition to expand cross-group "bridge-building" efforts to unite the NNWS.

#### *7. Strengthen the commitment to the Humanitarian Initiative*

The humanitarian initiative is the latest in a series of attempts that have sought to put in motion a multilateral process for nuclear disarmament, like the World Court Project<sup>18</sup> or the campaign for a Nuclear Weapons Convention. Such initiatives tend to emerge out of the recognition of the poor state of disarmament measures and institutions in place. Although Brazil has lent its support to the humanitarian initiative, the country could be more vocal about the stalemate in the UN disarmament machinery. However, Brazil continues to assert the primacy of the CD, referring to it as the "negotiating forum par excellence in the field of arms control" (Brasil, 2014) - despite the Cold War structure of the CD and the fact that it has been deadlocked for almost two decades. In order to strengthen the momentum of the humanitarian initiative, Brazil should recognize that many of the most relevant developments in the recent years have

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<sup>17</sup> For the past 17 years, the CD has not been able to achieve consensus on a program of work and a framework for implementing it. Every year, the sessions of the Conference conclude without any progress on substantive issues.

<sup>18</sup> The World Court Project originated in the 1980s with the objective of having the International Court of Justice (ICJ) rule on the legality of the threat or use of nuclear weapons. In 1996, the ICJ issued its advisory opinion. By the President's casting vote, the Court ruled that "the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and particularly the principles and rules of humanitarian law" (International Court of Justice, 1996.). Moreover, the Court decided unanimously that "there exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects" (Ibid).

occurred outside the established UN disarmament machinery and, thus, express its support for a diplomatic process that is “open to all and blockable by none” (ICAN, 2014). The country has already started to move towards this direction, as it now admits the UNGA as a forum suitable for nuclear disarmament negotiations. Nevertheless, it can go further and open up to the possibility of a non-traditional diplomatic process, which might involve ad-hoc institutions.

#### *8. Increase Awareness in Brazil about the Atomic Bomb Survivors and Their Stories*

As the humanitarian imperative features once again prominently in the international agenda, Brazil could work to raise awareness about the Hibakusha, the survivors of the atomic bombings in Japan. Although Brazil has a large Japanese community, counting over one hundred Hibakusha in 2013 (Alencar, 2013), the public is not familiar with their stories. In addition to keeping the memory of Hiroshima and Nagasaki alive, sharing the survivors’ experience would help to mobilize public support for nuclear disarmament and for Brazilian foreign policies in the nuclear field.

There is urgency to start this task, as the Hibakusha are ageing. As this year marks the 70th anniversary of the Hiroshima and Nagasaki attacks, it seems an appropriate date to launch such an effort.

## 4. Bibliography

### Primary sources

- » ABACC. 2013. *Annual Report: 2013*. Available at: <http://www.abacc.org.br/wp-content/uploads/2014/08/relatorio2013Site.pdf> [Accessed on 11 March 2015].
- » Acordo entre a República Federativa do Brasil e a República Argentina para o uso exclusivamente pacífico a energia nuclear, 20 August 1991. Available at: [http://www.abacc.org.br/wp-content/uploads/2009/10/acordo\\_bilateral\\_pt.pdf](http://www.abacc.org.br/wp-content/uploads/2009/10/acordo_bilateral_pt.pdf) [Accessed on 11 March 2015].
- » Agreement between the Republic of Argentina, the Federative Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the Application of Safeguards (Quadripartite Agreement), (INFCIRC/435), 13 December 1991. Available at: <http://fissilematerials.org/library/inf435.pdf> [Accessed on 11 March 2015].
- » Brasil. 2004. Statement by H. E. Ambassador Laercio Antonio Vinhas at the Vienna Conference on the Humanitarian Impact of Nuclear Weapons, 9 December 2014. Available at: [http://www.bmeia.gv.at/fileadmin/user\\_upload/Zentrale/Aussenpolitik/Abbruestung/HINW14/Statements/HINW14\\_Statement\\_Brazil.pdf](http://www.bmeia.gv.at/fileadmin/user_upload/Zentrale/Aussenpolitik/Abbruestung/HINW14/Statements/HINW14_Statement_Brazil.pdf) [Accessed on 11 March 2015].
- » \_\_\_\_\_. 1994. Decreto nº 1.246, de 16 de Setembro de 1994, Câmara dos deputados, Brasília, DF. <http://www2.camara.leg.br/legin/fed/decret/1994/decreto-1246-16-setembro-1994-449655-publicacaooriginal-1-pe.html> [Accessed on 11 March 2015].
- » Council of Delegates of the International Red Cross and Red Crescent Movement, 2011. Resolution 1: Working towards the elimination of nuclear weapons, 26 November 2011. Available at: <http://www.icrc.org/eng/resources/documents/resolution/council-delegates-resolution-1-2011.htm> [Accessed on 11 March 2015].
- » Declaração de Política Nuclear Comum Brasileiro-Argentina, Foz do Iguaçu, 28 de Novembro de 1990. Available at: <http://www.abacc.org.br/?p=627> [Accessed on 11 March 2015].

- » IAEA. 2013. Long-term R&D plan (2012-2023). Available at: [http://www.iaea.org/safeguards/documents/STR\\_375\\_-\\_IAEA\\_Department\\_of\\_Safeguards\\_Long-Term\\_R&D\\_Plan\\_2012-2023.pdf](http://www.iaea.org/safeguards/documents/STR_375_-_IAEA_Department_of_Safeguards_Long-Term_R&D_Plan_2012-2023.pdf) [Accessed on 11 March 2015].
- » \_\_\_\_\_. 1972. The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (INFCIRC/153).
- » ICAN. 2014. Statement to the Vienna Conference on the Humanitarian Impact of Nuclear Weapons, 9 December 2014. Available at: [http://www.bmeia.gv.at/fileadmin/user\\_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/Statements/HINW14\\_Statement\\_ICAN.pdf](http://www.bmeia.gv.at/fileadmin/user_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/Statements/HINW14_Statement_ICAN.pdf) [Accessed on 11 March 2015].
- » International Court of Justice. 1996. *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion of 8 July 1996. Available at: <http://www.icj-cij.org/docket/files/95/7495.pdf> [Accessed on 11 March 2015].
- » NPT Preparatory Committee. 2014. Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons. Working paper submitted by Ireland on behalf of the New Agenda Coalition (NPT/CONF.2015/ PC.III/WP.18), 2 April 2014. Available at: <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/prepcom14/documents/WP18.pdf> [Accessed on 11 March 2015].
- » \_\_\_\_\_. 2012. Joint Statement delivered by Switzerland on the humanitarian dimension of nuclear disarmament, 2 May 2012. Available at: [http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/prepcom12/statements/2May\\_IHL.pdf](http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/prepcom12/statements/2May_IHL.pdf) [Accessed on 11 March 2015].
- » NPT Review Conference. 2010. *Final Document (vol. I)* (NPT/CONF.2010/50), 18 June 2010. Available at: [http://www.un.org/ga/search/view\\_doc.asp?symbol=NPT/CONF.2010/50 \(VOL.I\)](http://www.un.org/ga/search/view_doc.asp?symbol=NPT/CONF.2010/50 (VOL.I)) [Accessed on 11 March 2015].
- » \_\_\_\_\_. 2000. *Final Document (parts I and II)*, (NPT/CONF.2000/28), 25 May 2000. <http://www.un.org/disarmament/WMD/Nuclear/2000-NPT/pdf/FD-Part1and2.pdf> [Accessed on 11 March 2015].
- » NSS. 2014. “In larger security: a comprehensive approach to nuclear security”, Joint Statement by Algeria, Argentina, Brazil, Chile, Egypt, Indonesia, Kazakhstan, Malaysia, Mexico, New Zealand, Philippines, Singapore, South Africa, Ukraine and Vietnam. March 2014, The Hague. Available at: [http://www.nss2014.com/sites/default/files/documents/final\\_joint\\_statement\\_in\\_larger\\_security\\_version\\_of\\_24\\_march\\_0.pdf](http://www.nss2014.com/sites/default/files/documents/final_joint_statement_in_larger_security_version_of_24_march_0.pdf) [Accessed on 11 March 2015].
- » OEWG. 2013. “Taking forward multilateral nuclear disarmament negotiations”, working paper submitted by the New Agenda Coalition to the Open-Ended Working Group (A/AC.281/WP.10).
- » Presidência da República. 1987. Discurso do Presidente José Sarney ao anunciar a vitória do programa autônomo de tecnologia nuclear, 4 September 1987. Available at: <http://www.biblioteca.presidencia.gov.br/ex-presidentes/jose-sarney/discursos/1987/76.pdf/download> [Accessed on 11 March 2015].
- » Treaty on the Non-Proliferation of Nuclear Weapons. 1968. Available at: <http://www.iaea.org/Publications/Documents/Infcircs/Others/infcirc140.pdf> [Accessed on 11 March 2015].
- » Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty). 1967. Available at: <http://www.iaea.org/Publications/Documents/Treaties/tlatelolco.html> [Accessed on 11 March 2015].



» UNGA. 2012. Joint Statement delivered by Switzerland on the humanitarian dimension of nuclear disarmament, 1st committee, 22 October 2012. [http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com12/statements/22Oct\\_Switzerland.pdf](http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com12/statements/22Oct_Switzerland.pdf)

### Secondary sources

» Alencar, Bruna. 2013. “Sobrevivente de Hiroshima estará em Mostra do Cinusp sobre genocídios”, USP [online], 2 May 2013. Available at: <http://www5.usp.br/26349/sobrevivente-de-hiroshima-estara-presente-em-mostra-do-cinusp-sobre-genocidios/> [Accessed on 11 March 2015].

» Avila, Carlos Federico Domínguez. 2012. “A crise dos mísseis soviéticos em Cuba (1962): um estudo das iniciativas brasileiras”, *Varia História*, v. 28, n. 47. Available at: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-87752012000100017&lng=en&nrm=iso](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-87752012000100017&lng=en&nrm=iso) [Accessed on 11 March 2015].

» Chunyan, Ma and Frank von Hippel. 2001. “Ending the Production of Highly Enriched Uranium for Naval Reactors”, *Nonproliferation Review*, Spring 2001.

» Dalaqua, Renata H. 2015. “The role of Non-Nuclear Weapon States in breaking the disarmament deadlock: Policy recommendations from a Brazilian perspective”. Rio de Janeiro: CPDOC/FGV.

» Desjardins, Marie-France and Tariq Rauf. 1988. “Opening Pandora’s Box? Nuclear-powered Submarines and the Spread of Nuclear Weapons”, *Aurora Papers*. Ottawa: Canadian Centre for Arms Control and Disarmament.

» Fischer, David. 1997. *History of the International Atomic Energy Agency: The First Forty Years*. Vienna: The Agency.

» Johnson, Rebecca. 2000. “Successful Conference: Now Words into Actions”, Acronym Institute.

» Mallea, Rodrigo. 2012. *La cuestión nuclear en la relación argentino-brasileña*, MA Dissertation, IESP/ Rio de Janeiro. Available at: [http://ri.fgv.br/sites/default/files/publicacoes/La%20cuestion%20nuclear%20en%20la%20relacion%20A-B%20%281968-1984%29%20Rodrigo%20Mallea%20IESP-UERJ%202012\\_0.pdf](http://ri.fgv.br/sites/default/files/publicacoes/La%20cuestion%20nuclear%20en%20la%20relacion%20A-B%20%281968-1984%29%20Rodrigo%20Mallea%20IESP-UERJ%202012_0.pdf) [Accessed on 11 March 2015].

» Mallea, Rodrigo; Spektor, Matias; Wheeler, Nicholas J. 2015. *The origins of nuclear cooperation: a critical oral history of Argentina and Brazil*. Woodrow Wilson International Center for Scholars and FGV Press.

» Moltz, James Clay. 1998. “Viewpoint: Closing the NPT Loophole on Exports of Naval Propulsion, Reactors”, *Nonproliferation Review*, Fall 1998. Available at: <http://cns.miis.edu/npr/pdfs/cmoltz61.pdf> [Accessed on 11 March 2015].

» Norris, Robert S. and Hans M. Kristensen. 2014a. “Worldwide deployments of nuclear weapons”, *Bulletin of the Atomic Scientists*, v. 70, n. 5.

» \_\_\_\_\_. 2014b. “Slowing nuclear weapon reductions and endless nuclear weapon modernizations: A challenge to the NPT”, *Bulletin of the Atomic Scientists*, v. 70, n. 4.

» Nystuen, Gro and Stein-Ivar Lothe Eide. 2013. “Wanted: Resolute Normative Leadership”, *European Leadership Network* [online]. Available at: [http://www.europeanleadershipnetwork.org/wanted-resolute-normative-leadership\\_768.html](http://www.europeanleadershipnetwork.org/wanted-resolute-normative-leadership_768.html) [Accessed on 11 March 2015].

- » Patti, Carlo. 2012. *Brazil in Global Nuclear Order*. PhD thesis. Università degli Studi di Firenze, Italy.
- » Philippe, Sébastien. 2014. "Bringing law to the sea: safeguarding the naval nuclear fuel cycle", *Bulletin of the Atomic Scientists* [online], 09/04/2014. Available at: <http://thebulletin.org/bringing-law-sea-safeguarding-naval-nuclear-fuel-cycle7418> [Accessed on 11 March 2015].
- » Rauf, Tariq. 2000. "An Unequivocal Success? Implications of the NPT Review Conference", *Arms Control Today*, No. 30, July/August 2000.
- » Serrano, Monica. 1994. "Brazil and Argentina" in Reiss, Mitchell and Robert Litwak (Eds.). 1994. *Nuclear proliferation after the Cold War*, Washington, D.C: Woodrow Wilson Center Press, 1994.
- » The Bulletin of the Atomic Scientists. 2015. *Nuclear Notebook*. Available at: <http://thebulletin.org/nuclear-notebook-multimedia> [Accessed on 11 March 2015].
- » Wildfire, 2014. *Nuclear disarmament: You're doing it wrong*. Available at: [http://www.wildfire-v.org/Doing\\_it\\_wrong.pdf](http://www.wildfire-v.org/Doing_it_wrong.pdf) [Accessed on 11 March 2015].

## 5. Appendix: List of Acronyms

ABACC: Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

CD: Conference on Disarmament

CTBT: Comprehensive Nuclear Test-Ban Treaty

DI: Design Information

DPRK: Democratic People's Republic of Korea

HEU: Highly Enriched Uranium

IAEA: International Atomic Energy Agency

ICJ: International Court of Justice

ICRC: International Committee of the Red Cross

LEU: Low-Enriched Uranium

NAC: New Agenda Coalition

NAM: Non-Aligned Movement

NNWS: Non-Nuclear Weapon State

NPT: Nuclear Non-Proliferation Treaty

NSS: Nuclear Security Summit

NWFZ: Nuclear-Weapon-Free Zone

NWS: Nuclear Weapon State

OEWG: Open-Ended Working Group

OPANAL: Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean

PNE: Peaceful Nuclear Explosion

SCCC: Common System for Accountability and Control

UN: United Nations

UNGA: United Nations General Assembly

UNODA: United Nations Office for Disarmament Affairs



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