Nuclear Brazil

Introduction

As an emerging power, Brazil is a country to look for in the international discourse in the future. As a member of BRICS, which consists of the countries of Brazil, Russia, India, China, and South Africa, Brazil possess close ties with Russia in regard to different aspects of development. Coexisting within the BRICS alliance, Brazil and Russia have had an increased cooperation in the realm of Brazil’s nuclear power program. Brazil, a member of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), must follow guidelines set into place by the NPT. Adhering to these guidelines, Brazil is strengthening their nuclear power program with the use of nuclear power plants and uranium mining and enrichment. As ties between Brazil and Russia strengthen, with Russia being a Nuclear Weapon State, Russian influence on Brazil’s nuclear program is a cause for concern considering the strength of Russia’s nuclear stockpile and Brazilian nuclear capabilities. Focusing on the present and future implications, Brazil has the ability to pose a threat as they increase their relations with Russia and as they heighten their nuclear capabilities.

Brazil

Modern Brazil carries nuclear capabilities that continue to strengthen. Brazil currently has two operating nuclear power plants that produce power for roughly 3% of the country.¹ These power plants, Angra 1 and Angra 2, are fueled by enriched uranium. Angra 1 began operation in 1982. Angra 2 began operation in 2000. In 1984 Angra 3, a third power plant, began to be built. Construction was halted due to licensing and funding issues. With its completion still awaiting, Brazil is seeking outside help to finish the project. There has been projected interest from Chinese and Russian companies.² Located in Resende, Brazil is another plant that they call Resende. Resende is a location where uranium is enriched so that it can be used in Angra 1 and 2. Enrichment at this facility ranges from 1% to 4%, but has the capabilities to create highly enriched uranium.³ The Brazilian military leases uranium enrichment technology to Brazil’s

¹ World Nuclear Association
² World Nuclear Association
³ Uranium is considered highly enriched when it is enriched 20% or higher. SciElo
civilian nuclear program; Brazil is the only non-nuclear weapon state to do this.\textsuperscript{4} Brazil is also the only non-nuclear weapon state within the BRICS alliance.

With a prior nuclear weapons program and present increased nuclear capabilities, Brazil is faced with opportunity and growth. In the 1960s Brazil began to pursue a nuclear weapons program that included uranium enrichment and technology development that would enhance nuclear capabilities. The clandestine nuclear program that the Brazilian military pursued was put to a halt. In 1998 Brazil signed the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) which provided an end to their nuclear weapons program. With the capacity to increase nuclear power Brazil complied with the protocol of the NPT.

Brazil contains one of the world’s largest supplies of uranium.\textsuperscript{5} Starting in 1982 Brazil began mining its own uranium. There are multiple sites still in use today where uranium is mined and transported for use. Once mined, the uranium is converted for different uses. A form of conversion includes enrichment. Resende is a power plant that is used to enrich mined uranium that is then used in the Angra 1 and 2 power plants. As of 2016, Resende produces enough enriched uranium to power Angra 1 completely and 20\% of Angra 2.\textsuperscript{6} As a non-nuclear-weapon state, Brazil carries expansive nuclear proficiency.

Accompanying these means of nuclear power and as a means to modernize their navy, Brazil has initiated a nuclear submarine program. This program adds Brazil to the list of being the only non-nuclear weapon state to have such a program. Enriched uranium, upwards of 19\%, is used in the submarine program now. This program is still in the developmental stages and is set to complete its first nuclear powered submarine by 2023 with operation starting in 2025.\textsuperscript{7} Through this program, concerns have arisen about the possibility of proliferation. Still bound by the Treaty on the Non-Proliferation of Nuclear Weapons, Brazil faces challenges when enriching uranium and for this nuclear focus. While the enriched uranium may not be directly weaponized, a submarine possesses the potential to carry and launch missiles.

\textbf{Russia}

In 1949, the Soviet Union, now Russia, secured its spot in the nuclear arms race by successfully testing a nuclear device. They became the second nation to have success in testing and detonating a nuclear weapon, right behind the United States. This marked them as a nuclear

\textsuperscript{4} Nuclear Threat Initiative
\textsuperscript{5} Brazil contains roughly 5\% of the worlds uranium which consists of 278,000 tonnes of uranium. World Nuclear Association
\textsuperscript{6} World Nuclear Association
\textsuperscript{7} Nuclear Threat Initiative
weapon state. As the Trump Administration enters office they are faced with, according to the Arms Control Association, Russia containing the highest nuclear warhead inventory in the world.\(^8\) Looking deeper into their inventory, roughly 2,510 warheads are retired, leaving approximately 4,500 stockpiled warheads, and 1,561 deployed warheads.\(^9\) Having signed the Treaty on the Non-Proliferation of Nuclear Weapons\(^10\), the NPT recognizes Russia as a nuclearweapon state (NWS). Under this treaty, the nuclear weapons that Russia holds are legitimized. While legitimized, as a NWS under the NPT, Russia must adhere to rules regarding their nuclear arsenal. Creating and maintaining a nuclear arsenal must not be done in perpetuity. Russia is in current upgrade and modernization of its military. This includes strengthening their armament and upgrading their equipment. Upgrading air and land equipment, missile systems, expanding ground forces, upgrading fighting vehicles, along with increasing defense spending are all part of the State Armaments Program, also known as GPV, in Russia. At the end of 2017, Russian officials will be meetings to finalize the GPV for 2025. This will allow more technological advances for Russia’s armed forces.\(^11\)

As the nuclear program in Brazil continues to grow, Russian interest in their program is seen. In 2015 Dmitry Medvedev, the prime minister of Russia, and Michel Temer, the then Vice President of Brazil, met in Moscow to conduct the seventh meeting of the Russian-Brazilian High-Level Commission on Cooperation. During this meeting, many deals were signed that reiterated economic and trade cooperation as well as nuclear and military technology agreements. Brazil and Russia came to a trade agreement surrounding military technology. They decided to increase Brazilian import of Russian helicopter equipment as well as other technologies used in the military.\(^12\) Most recently, on November 27, 2017, Russia and Brazil signed a Memorandum of Understanding to further develop cooperation regarding nuclear power.\(^13\) ROSATOM from Russia and Centrais Elécticas Brasileiras (Eletrobras) with Eletrobras Termonuclear S.A. from Brazil signed the memorandum. The State Atomic Energy Corporation called ROSATOM is a large Russian electricity generating company that generates power to Russia with the use of nuclear power, among others. ROSATOM has the leading role in the production and enrichment of nuclear fuels.

\(^8\) The Arms Control Association states that Russia contains an estimated 7,000 nuclear warheads. This tops the estimated 6,800 nuclear warheads of the United States.

\(^9\) Arms Control Association: The number of Russian deployed warheads at 1,561 once again tops the 1,393 deployed warheads of the United States.

\(^10\) United Nations Office for Disarmament Affairs

\(^11\) The Jamestown Foundation

\(^12\) Strategic Culture Foundation: Russia-Brazil: Strategic Partnership is Expanding

\(^13\) ROSATOM: ROSATOM and Brazilian state-owned companies sign a memorandum of understanding to cooperate in the nuclear energy sector.
of uranium around the globe. The role of ROSATOM in the global uranium market is extensive as it makes up roughly 17.7% of the global nuclear fuel market. Eletrobras is an electricity company out of Brazil. It consists of different methods of generating electricity for the country, nuclear power being one of those methods. This newly signed cooperation raises questions regarding the powerhouse Russian company ROSATOM and Brazil’s Eletrobras, and how it will influence the nuclear program in Brazil in the coming years.

**NPT**

Gaining acknowledgment, The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was introduced in 1970. This treaty, still in use today, provides a multilateral agreement to promote disbarment of nuclear weapons by the nuclear-weapon states. Over the years a total of 191 states have signed the NPT which means that more countries have signed and ratified this treaty than any other arms regulation and disarmament agreement. This treaty incorporates different aspects that keep the treaty up to date, such as a rule stating that every five years the treaty and operation of the treaty must be reviewed. The treaty also created a safeguard mechanism in which the International Atomic Energy Agency (IAEA) regulates and investigates nuclear programs. The IAEA ensures that all parties to the treaty are following and maintaining treaty rules.

In 1998, Brazil became a member of this treaty by signing and initiating its regulations. The signing of this treaty began safeguard regulations by the IAEA on Brazil and their nuclear program. Brazil’s participation with the NPT has increased over the years. Brazil has actively engaged in conferences and forums regarding the NPT, such as the Commission of the United Nations General Assembly. Recently the IAEA has assigned Additional Protocol within their duties to regulate and safeguard nuclear programs. This Additional Protocol is another safeguard that will allow the IAEA to have more tools to verify the peaceful use of all nuclear materials. Brazil has not yet agreed to and signed the Additional Protocol by the IAEA. Their neighboring state of Argentina has also withheld from the Additional Protocol. Brazil has refrained from accepting this new agreement because of its emphasis on non-proliferation rather than nuclear

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14 ROSATOM: “ROSATOM with its 1/3 world market share takes the lead in global uranium enrichment services and covers 17.7% of the global nuclear fuel market.”

15 United Nations Office for Disarmament Affairs

16 International Atomic Energy Agency: Additional Protocol
disarmament. Brazil is also concerned with how this new protocol will apply to their nuclear submarine program and how it influences The Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). The ABACC is a bilateral agreement among Brazil and Argentina that promotes the exclusive peaceful use of nuclear energy. By not signing this Additional Protocol Brazil has not participated in this safeguard measure that is essentially part of the NPT.

Outcomes

As a result of an increase in nuclear power and capabilities in Brazil and an increased Russian presence, there are some concerning outcomes. Although Brazil is tied under the Treaty on the Non-Proliferation of Nuclear Weapons, it is expected to see an increase in production of low-enriched uranium as high as 19%. Uranium enriched to this level is on the border of being highly-enriched. When uranium is enriched 20% or higher, it is considered weapon grade material and it is capable of powering a nuclear weapon. During this increase in uranium enrichment, it is expected to see an increase in Russian influence on this process. As a result of success within their nuclear program, Brazil has the confidence and capability to pursue and potentially explore new forms and uses of nuclear energy. As an advanced nuclear state, Russia can nudge and support Brazil in ways that promote nuclear exploration. Brazil is also experiencing corruption at the highest levels as well as an economic recession. These two factors lead to an unstable government and economy which creates a vulnerable state in Brazil and allows opportunity for Russia to have more influence. With Brazil and Russia having a strategic partnership and strengthening their nuclear alliance with the new signed memorandum, support for this implication is strong. As Russian influence in Brazil’s nuclear program grows, it is expected to see an increase in trade between Russia and Brazil. The trade of nuclear technology as well as other items can help Brazil climb out of a recession as well as help Russia gain more significance within Brazil. Alongside an increase in trade with Russia is an increase in the exportation of enriched uranium from Brazil. As Brazil expands its ability to mine and enrich its own uranium, it increases the ability to export. In 2016 Brazil and Argentina signed an agreement that authorized Brazil’s first export of enriched uranium.18

17 World Nuclear Association: Non proliferation
In regard to U.S. national security, Russian nuclear influence in Brazil will lead to a stronger alliance among the two in regard to nuclear trade and exploration. This will impact U.S.-Brazil nuclear relations and may lead to lower uranium trade among the U.S. and Brazil. Tensions between Russia and the U.S. will escalate as Russia and Brazil collaborate.

**What can be done**

As the topics of uranium enrichment and increased Russian influence in Brazil’s nuclear program escalate, there are some measures that the United States can consider taking. As a less confrontational position, the United States can offer Brazil its expertise in the field of nuclear energy and other nuclear skills. By offering its help, the United States has the possibility to gain respect within the nuclear operation in Brazil. This will also allow the United States to hinder Russian impact on Brazil’s developing nuclear program.

Another way in which the United States can impede the bilateral relationship between Brazil and Russia is to impose sanctions. An economic sanction that generates trade barriers between the two nations can hinder how much influence Russia has over Brazil. A trade barrier enforced on nuclear technologies and machinery from Russia to Brazil will decrease the ability for Russian influence on Brazil’s nuclear capabilities as well as increase possible U.S.-Brazil trade in this category, thus giving the United States leverage and more control over nuclear growth in Brazil. This sanction on machinery trade will also allow the United States to know more about Brazil’s nuclear program and what kinds of technologies they carry. It also allows the United States to follow Brazil and what potential nuclear capabilities Brazil may possess.

**Conclusion**

Brazil has shown an increased interest and capability within the field of nuclear energy. From an abandoned nuclear weapons program in the 1960s to beginning a nuclear submarine program as well as signing a memorandum with Russia to solidify their nuclear cooperation, Brazil has shown capability as well as potential in their nuclear program. With Russia being a world nuclear powerhouse, their impact on Brazil could be detrimental to the security of the United States and the relationship between the United States and Brazil. By offering their expertise to Brazil, the United States can gain access and guide the nuclear program in Brazil. Following and challenging the guidelines set in place by the NPT, Brazil has shown interest in pursuing and strengthening their potential. With Brazil not signing the Additional Protocol and renewing the memorandum on cooperation with Russia on November 27, 2017, there are
concerns regarding where their nuclear program is headed. A Russian presence in Brazilian nuclear discourse creates questions. Russia’s goal must be considered in this subject.

Bibliography


