International Atomic Energy Agency (IAEA)

Addressing the unsupervised acquisition of nuclear weapons

Director: Álvaro Partida Sevilla

Moderator: Santiago Barahona Delgado

I. INTRODUCTION

The International Atomic Energy Agency (IAEA), is an independent international organization established in 1957 that works within the United Nations, and was initially created by The U.S. Ratification set out in the Constitution of the Statue by former President Dwight David Eisenhower on the 29th of July, 1957. The IAEA´s history is strongly linked to the controversial applications in nuclear technology. For instance, President Eisenhower's ideas about international cooperation in 1953 for nuclear weapons, which 81 nationals quickly approved in October of 1956 (*History*, n.d.).

The speech from Eisenhower followed, "The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose" (*The Statute of [...],* n.d.). As of 2024, 164 members conform to the IAEA, as well as other partners worldwide. All members promote a safe, secure, and peaceful use of nuclear energy. The IAEA encourages members to share nuclear information and findings with other members to ensure the world-wide development of atomic energy. In the process, it sets precautions to prevent the military use of such technologies. The IAEA´s work includes setting the framework for cooperative efforts to build and strengthen an international nuclear safety and security regime, and verifying States' fulfillment of their non-proliferation undertakings under the Nuclear Non-Proliferation Treaty (NPT) (*History*, n.d.).

The official headquarters of the IAEA are in Vienna, Austria, at the Vienna International Centre. Other important offices and regional centers are found in Geneva Switzerland; New York, USA; Toronto, Canada; and Tokyo, Japan. The IAEA runs scientific laboratories that intend the acquisition of information regarding atomic energy, and such laboratories can be found in Vienna and Seibersdorf in Austria, Trieste in Italy, and Monaco. The Secretariat is staffed by 2500 people, who are all multidisciplinary professionals, as well as counting with support staff from over 100 countries (*2015 REVIEW CONFERENCE [...]*, n.d.). These individuals ensure that "under Safeguards Agreements, IAEA inspectors regularly visit nuclear facilities to verify records maintained by State authorities on the whereabouts of nuclear material under their control, to check IAEA-installed instruments and surveillance equipment, and to confirm physical

inventories of nuclear material. These and other safeguard measures provide independent international verification that governments are abiding by their commitments to the peaceful use of nuclear technology. A precondition for the implementation of safeguards is a formal safeguards agreement between the Agency and the State" (NTI, 2024).

One situation in which the IAEA was an example for the international community was in 1981 when Israel conducted Operation Opera, in which the nuclear research site Osirak in Iraq was targeted. The IAEA helped mediate the situation, by preventing the construction of nuclear weapons. In 2003, during the "Golf War", the site was destroyed by bombardment, and since then, the IAEA has participated in the reconstruction of the site (Fabbri, 2009).

The IAEA is not a branch of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), but is involved with a key verification role that involves investigation. The IAEA also serves as a means for members to share findings and peaceful resolutions regarding nuclear energy. "In other words, the IAEA administers international safeguards to verify that non-nuclear weapons States are party to the NPT, so it fulfills the non-proliferation commitment they have made" (*Key Roles*, n.d.). All of this is done with the ultimate goal of using atomic energy for serving humanity, and not giving countries the chance of creating a nuclear armament.

II. HISTORY OF THE PROBLEM

World War II and the Manhattan Project

In the summer of 1939, Leo Szilard and Albert Einstein warned the president of the "United States of America", "Franklin D. Roosevelt", of the military capabilities of an uncontrolled fission chain reaction. Shortly after, on September 1st, 1939, World War II began when Nazi Germany invaded Poland. Roosevelt appointed the Advisory "Committee on Uranium" on November 1st of the same year; it was reported that a chain reaction in uranium was possible, and that report initiated a $6000 fund to begin research on nuclear fission. A breakthrough was made when element 94 was discovered in 1941, to be later named plutonium in 1942.

On December 7th, 1941, Imperial Japan surprised the US by bombarding the naval base at Pearl Harbor on Oahu Island, Hawaii. This attack caused the entry of the US into World War II. This entry caused the US' atomic research to increase. During the spring of 1942, many policies and funding were made to obtain fissionable materials and construct and manage laboratories and manufacturing facilities associated with atomic research. In August of 1942, the Manhattan Project was initiated, Leslie Richard Groves and physicist J. Robert Oppenheimer were placed in charge. Later in the year, different advancements were made, with the construction of factories to process the plutonium and uranium that was needed for the project, and the success of Enrico Fermi in producing the first-ever controlled nuclear chain reaction at the University of Chicago. In August of 1943, a combined policy committee with Great Britain and Canada was established, starting international cooperation in atomic research (Ray & Riley, 2023).

Later, on May 7th, 1945, Nazi Germany surrendered to the Allies, ending the armed conflict in Europe and marking an important point in nuclear research as the race for the creation of nuclear armament between the US and Nazi Germany stopped. However, Imperial Japan was yet to surrender or cease its war efforts and continued the atomic research. On July 16th, 1945, the Trinity Test was conducted on the Alamogordo Bombing Range in New Mexico, the Alamogordo Bombing Range witnessed what was the first-ever atomic bomb explosion, with a force of 18 kilotons. (*History of nuclear [...],* n.d.).

Subsequently, on August 6th, 1945, an atomic weapon of uranium-235 nicknamed Little Boy, was airburst 580 meters above Hiroshima, Japan, with a force of around 12.5 kilotons, causing a total of 140,000 Japanese deaths at the end of 1945. Three days later, on August 9th, in Nagasaki, Japan, the US airbursts 500 meters above the ground a second bomb, the bomb was a duplicate of the bomb assembled in the Trinity Test. The explosion killed around 70,000 Japanese at the end of 1945, with a force of 22 kilotons in the initial blast. Many of the deaths in both cities occurred later after the initial blast as a result of radiation poisoning and its side effects. However, the destruction of Hiroshima and Nagasaki caused the Japanese surrender on September 2nd, 1945, ending World War II. (*Race for the [...]*, n.d.).

1945-1960s

On October 24th, 1945, the United Nations (UN) was created as a way to assess the world's needs following the destruction of World War II, and to prevent any further conflict. On January 24th, 1946, in London, the first-ever resolution was passed by the General Assembly of the UN, titled the "Establishment of a Commission to Deal with the Problems Raised by the Discovery of Atomic Energy"; the resolution aimed at eliminating the use of nuclear weapons and addressing them. UN Resolution 810 A (IX) expressed the hope of international atomic energy cooperation, the International Atomic Energy cooperation was implemented with the creation of the IAEA on July 29th, 1957. However, the second half of the 20th and the start of the 21st century experienced a large amount of nuclear military technology advancements and tests (*The Formation of [...],* n.d.).

As a result of the nuclear advancements by multiple parties, the Cold War would begin on March 12th, 1947, and would not end until the collapse of the Union of Soviet Socialist Republics (USSR) on December 26th, 1991. "The Cold War was waged on political, economic, and propaganda fronts and had only limited recourse to weapons. The term was first used by the English writer George Orwell in an article published in "1945", to refer to what he predicted would be a nuclear stalemate between "two or three monstrous super-states, each possessed of a weapon by which millions of people can be wiped out in a few seconds "" (Editors of Encyclopedia Britannica, 2024).

The following delegations have stated to possess nuclear weapons as of summer 2024; the United States of America (1945); the Russian Federation (as successor to the former Union of Soviet Socialist Republics; 1949); the United Kingdom of Great Britain and Northern Ireland (1952); the French Republic (1960); the People's Republic of China (1964); the Republic of India (1974); the Islamic Republic of Pakistan (1998); the Democratic People's Republic of Korea (2006). It is believed that the State of Israel possesses nuclear weapons, however, there is no concrete evidence or confirmation. Other delegations such as The Republic of South Africa (1979), the Republic of Kazakhstan (1991), Ukraine (1991), and the Republic of Belarus (1991) formerly possessed nuclear weapons but completed full disarmament for different reasons (Zeidan, 2023).

With the development of atomic energies throughout the second half of the 20th and the start of the 21st century, many events can be highlighted. Among these events, the Russell-Einstein manifesto was issued, in the manifesto many leading scientists stressed the dangers of the use of nuclear weapons in an armed conflict, and urged all governments

to seek peaceful solutions. Other events include disarmament campaigns around the world, such as The Campaign for Nuclear Disarmament in the UK in 1958 or New York City on June 12, 1982, when one million people gathered in the biggest anti-war protest to support the nuclear freeze movement; the Antarctic Treaty to ban any nuclear tests in Antarctica, and the largest-ever nuclear bomb test conducted, occurred on October 30th, 1961, nicknamed the Tsar Bomba by the USSR with a force of 58 megatons (*History of nuclear [...],* n.d.).

From October 16th to 29th, 1962, the Cuban Missile Crisis unfolded, the conflict created a tense stand-off between the US and the USSR began when the presence of Soviet missiles in Cuba was discovered, creating a dire point for humanity during the Cold War. This event brought the US and the USSR to the brink of a nuclear-armed conflict, and most likely the destruction of the world, because as military analyst Donald Brennan theorized in 1962, with the idea of "mutually assured destruction" (MAD) in the case of full-scale nuclear-armed conflict, Brennan assured there would be no winner or surviving country. Following large protests in Europe and the US, the Partial Test Ban Treaty opened for signature in Moscow, in which the Treaty delegates agreed to not test nuclear weapons in the atmosphere, outer space, and underwater. On February 14th, 1967, Latin America became nuclear-free with the Treaty of Tlatelolco in Mexico City, in which the Treaty parties agreed to not develop, test, or acquire nuclear weapons (Editors of Encyclopaedia Britannica, 2024).

1960s-1990s

A big breakthrough was made in atomic energy military uses on July 1st, 1968 when the Non-Proliferation Treaty (NPT) opened for signature. The treaty aimed to stop the development of nuclear technologies for military uses for all parties. The three main objectives of the NPT are non-proliferation between all sides of the treaty, full disarmament of nuclear armament, and the peaceful use and development of nuclear energy. This treaty also helps promote safety for states that don't participate in nuclear advancements but that could receive the aftermath of nuclear-armed conflict. The NPT also ensures that states without nuclear weapons will not acquire them, while states with nuclear weapons actively pursue disarmament. As a final benefit of the treaty, all states have the capability to access atomic energies for peaceful purposes, under precautions. On August 6th, 1985, the South Pacific became nuclear-free with the signing of The South

Pacific Nuclear Free Zone Treaty in Rarotonga, in the Cook Islands. As a result of the efforts to mediate both sides during the Cold War, the International Physicians for the Prevention of Nuclear War, won the Nobel Peace Prize in 1985, by focusing on the consequences of a nuclear-armed conflict on individuals. On July 10th, 1991, South Africa joined the NPT by dismantling all six nuclear weapons that the state claimed to possess (NTI Editors, 2022).

Later, on December 26th, 1991, the USSR collapsed, leaving nearly 30,000 nuclear weapons spread over four newly formed sovereign states. Ukraine, Kazakhstan, and Belarus were left with nuclear armament but decided to either dismantle or give Russia the nuclear weapons. Southeast Asia became nuclear-free on December 15th, 1995, by establishing a zone free of nuclear weapons that covers the Republic of the Union of Myanmar in the west, the Republic of the Philippines in the east, Lao People's Democratic Republic and the Socialist Republic of Vietnam in the north, and the Republic of Indonesia in the south. The following year on April 11th, 1996, with the Treaty of Pelindaba in the Arab Republic of Egypt, Africa became a nuclear-free zone, and 43 members pledged to not build, test, or stockpile nuclear weapons (*History of nuclear [...],* n.d.).

The International Court of Justice (ICJ), on July 8th, 1996, hands down an advisory opinion that states that the threat and use of nuclear weapons are commonly against internal law, but that the court was unable to conclude whether or not the use of nuclear weapons would be lawful or unlawful in the case where they describe as a case of self-defense. In the advisory opinion the very survival of a country is in peril. Later that year, on September 24th, 1996, the Comprehensive Test Ban Treaty opened for signatory countries that would completely ban any nuclear tests. The People’s Republic of China, the French Republic, the United Kingdom of Great Britain and Northern Ireland, the Russian Federation, and the United States of America, all signed the treaty, however, the Republic of India stated that it would not sign the treaty. In 1998, India tested three underground nuclear weapons, where Pakistan later responded with six nuclear weapon tests (*History of nuclear [...],* n.d.).

2000s-2009

The 21st century has also marked important events and milestones in nuclear history starting with the year 2000, in which Russia was involved in different activities to

promote NPT by disarming some arms, and signing the Strategic Arms Reduction Treaty (START II). 2001 was a year in which the United States faced hardships, as on September 11th, 2001, terrorists hijacked four commercial airplanes, causing the biggest attack in history on the US homeland. Two planes were directed towards the World Trade Center, one to the Pentagon and one crashed in rural Pennsylvania, however, it is speculated that it was headed towards Washington DC. Later, this had consequences on nuclear arms in the world, as the panic rose because of the attacks, and a later armed conflict led by the US against multiple Middle Eastern nations. 2002 and 2003 saw North Korea develop its nuclear arsenal and threaten Western nations. For example, in December of 2002, the IAEA reported that North Korea had disabled monitoring devices on nuclear research sites. The biggest change was on January 10, 2003, when North Korea announced its withdrawal from the NPT. In September of the same year, the IAEA found traces of weapons-grade Uranium in Iran (*Timeline of the [...],* n.d.).

From 2004 to 2009, the world faced many changes towards NPT, with the main actors being North Korea, Iran, the United States and more. Some changes include expansion on nuclear arsenals, signing of treaties that promote NPT, and more. In 2006, North Korea stated that it has become a nuclear armed state and tested its first nuclear weapon, and Iran made advancements on its nuclear program by acquiring materials and addressing international concerns. 2007 was similar to 2006, and it was marked by the signing of multiple nuclear treaties in Asia. 2008 saw the end of a five-year long negotiation stalemate regarding North Korea's NPT. North Korea agreed to shut down the Yongbyon nuclear facility, and allow the IAEA to conduct inspections, in exchange for getting energy aid from the US, as well as removing some economic sanctions imposed. On September 6th, Israel used missiles to attack northeastern Syria. It was later confirmed that the target was an incomplete nuclear reactor. The year 2009 saw North Korea resume its nuclear weapon activities, as on May 25th the second ever nuclear test of the country was conducted. This year was also marked by diplomacy between the United States and Russia, leading to US President Barack Obama winning the 2009 Nobel Peace Prize (*Timeline of the [...],* n.d.).

III. CURRENT SITUATION

According to the Stockholm International Peace Research Institute (SIPRI), geopolitical relations face shifts and disagreements as the number of nuclear weapons being developed increases. Nine delegations own nuclear weapons in the international community, with eight delegations having declared possession, with one not reporting on its ownership. The states that have declared ownership of nuclear weapons are the United States of America, the Russian Federation, the French Republic, the People's Republic of China, the United Kingdom of Great Britain and Northern Ireland, the Republic of India, the Islamic Republic of Pakistan, the Democratic People's Republic of Korea, while the State of Israel is yet to declare possession.

Of the total estimated 12,121 nuclear weapons in the world, as of January 2024, around 3,904 are deployed with missiles and aircraft, 60 more than in January 2023. Of the deployed nuclear arms, around 2,100 are kept in "a state of high operational alert on ballistic missiles" (*Role of Nuclear [...]*, 2024), meaning that owner states are prepared for a potential nuclear offense. Almost all of the nuclear weapons are owned by Russia and the United States, however, it is believed that China has for the first time warheads on high operational alert. At the same time, the number of total warheads worldwide has gradually decreased, going from 12,705 in January 2022 to 12,512 in January 2023. Still, this data shows that states remain highly active in nuclear energy and its military capabilities despite agreements and an effort to dismantle nuclear weapons. This claim is backed by an increase in nuclear arms spending by the nine states that own nuclear weapons, from $80.7 billion in 2023 to $91.4 billion in 2024, showcasing a 13% increase (Sabbagh, 2024).

The Russian Federation and the United States of America

The Russian Federation and the United States of America together possess nearly 90% of all nuclear weapons in the world. Still, the number of deployed warheads has remained relatively stable in both countries since 2023, although it is estimated that Russia deployed around 36 warheads ready to be operated in comparison to January 2023. However, transparency and talks between the two nations regarding nuclear weapons have been in deterioration ever since Russia's full-scale invasion of Ukraine in February 2022 (SIPRI, 2024). In 2023, many claims were made regarding the belief that Russia transported nuclear weapons to the Republic of Belarus, nevertheless, no concrete

evidence or claims exist. The United States in 2024, transported a nuclear missile launching system to the Republic of the Philippines for a military exercise. The missiles have an intermediate range (1000 to 5500 kilometers), and China accused the United States of causing a confrontation in the South China Sea. Even so, both Russia and the United States continue to dismantle more than 1,200 warheads (Liang, 2024).

People's Republic of China

Another significant event in nuclear weapon ownership is an increase in China's arsenal from 410 warheads in January 2023, to 500, alongside the belief that China is deploying a small number of warheads to missiles during peacetime. Based on current information, it is believed that China could potentially be in possession of as many intercontinental ballistic missiles (ICBMs; a range of more than 5,500 kilometers) as Russia or the United States at the end of the current decade (SIPRI, 2024).

The United Kingdom of Great Britain and Northern Ireland

Regarding the United Kingdom, it is not believed that its nuclear weapon arsenal increased in 2023, however, its warhead stockpile located in missiles and aircraft is thought to increase in the near future because of an announcement in 2021 by the British government, in which it was stated that it was raising the limit from 225 to 260 warheads. The government also stated that the quantities of nuclear weapons, deployed warheads, or deployed missiles would no longer be public information (SIPRI, 2024).

French Republic

As of July 2023, the French Republic had in existence 290 warheads, with most of them being located in submarines. In 2023, France continued developing its programs to fabricate a third-generation nuclear-powered ballistic missile submarine (SSBN). France has also been invested in constructing a new air-launched missile, with the addition of renovating existing nuclear systems (*Arms control and [...]*, n.d.).

Republic of India and the Islamic Republic of Pakistan

In 2023, India's nuclear arsenal slightly expanded, and both India and Pakistan continued the development individually of a new system that would improve nuclear delivery. The numbers say that India possesses more nuclear weapons than Pakistan, with

India having 172 and Pakistan 170. Pakistan remains India's main obstacle towards NPT and vice versa, as both countries face tensions due to political differences that root from the end of the British Raj. Despite global efforts, India has shown greater emphasis on longer-range weapons capable of reaching targets throughout China, unlike Pakistan (SIPRI, 2024).

The Democratic People's Republic of Korea

North Korea continues to firmly believe that its nuclear military program is a central element of its national security. It is estimated that the country has constructed 50 warheads and has sufficient material and technology to develop 40 more. North Korea didn't conduct any nuclear explosion test in 2023, but it appears to have tested its first short-range ballistic missile (1000 kilometers or less) and to have developed at least two types of land-attack cruise missile (LACM) with the intention to deliver nuclear arms (SIPRI, 2024).

State of Israel

The State of Israel has yet to publicly acknowledge its possession of nuclear weapons. However, it is believed that Israel continues to upgrade its nuclear arsenal, and appears to modernize at Dimona its plutonium production site (SIPRI, 2024).

Ukraine and Gaza armed conflicts

After Russia's full-scale invasion of Ukraine in February of 2022, global relations between member states have shown hardships. In February 2023, the Russian Federation announced its suspension of participating in the 2010 Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, which was the last nuclear weapon control treaty restricting Russia's and the United States' nuclear efforts. In response to this, the United States suspended sharing information regarding nuclear research. The Stockholm International Peace Research Institute (SIPRI) reports fewer improvements in relations between the United States and Russia following the armed conflict in Ukraine, as Russia has threatened the United States and allies for support to Ukraine. A nuclear weapon drill near the Ukrainian border in Russia was conducted in May 2024.

In June of 2023, the United States and the Islamic Republic of Iran reached an informal agreement that eased tensions between the two countries. However, the start of

the Israel-Hamas war in October of the same year, created disagreements between the two sides, leading to proxy attacks of the United States forces in Iraq and Syria, deeply complicating diplomatic efforts. Also, in June of 2023, the United States Secretary of State visited Beijing, in which China and the United States agreed to improve military-to-military communication.

IV. INTERNATIONAL ATOMIC ENERGY AGENCY AND UNITED NATIONS ACTIONS

Ever since the IAEA was created by the statute of former President Robert D Eisenhower, many actions had been taken by the organization throughout the time. Deputy Director General and Head of the Department of Management, Margaret Doane , explored the past and present safety standards from various perspectives. Being said so, "The IAEA commenced its safety standards programme in 1958. The emphasis placed on quality, fitness for purpose and continuous improvement has led to the widespread use of the IAEA standards throughout the world" (Amano, 2018). The first article of the IAEA was called "'Safety Series No. 1 – Safe Handling of Radioisotopes' which was the IAEA's very first publication, which dates back to 1958, released a year after the Agency was established" (*The Evolution of [...],* 2023).

Nowadays, the IAEA Safety Standards consists of a series of publications that had been developed through the consensus of international forces. Nuclear safeguards " are measures to verify that states do not use nuclear materials to develop weapons and that they respect their obligations under international non-proliferation treaties" (*Nuclear safeguards and [...]*, 2012). The Safety Standards covers a range of requirements for the safe and peaceful use of nuclear science and technology which serves as a technical basis for the IAEA to carry out its safety review missions and for countries to report on their national obligations as parties to multiple safety conventions.

According to the Deputy Director General, Head of the Department of Nuclear Safety and Security Lydie Evrard "The IAEA Safety Standards are flagship publications for the Agency, due to the IAEA mandate and the unique history of their development" (*The Evolution of [...]*, 2023). The mandate highlights how the IAEA statute authorizes the

Agency to establish and adopt safety standards. Which creates international cooperation, advisory service and peer review missions. Safety standards are the reference documents for all the IAEA activities that compromises and supports the strengthening of nuclear and radiation safety infrastructures around the world. Evrard ends her point by remarking why its importance through history remarks so much more .

During the following decades of the 50s and 60s, the Safety Standards were individual books covering technical areas, but that began changing in the 1970s when the framework of Nuclear Safety Standards started coming into place in the year 1974. For instance, the Democratic People's Republic of Korea signed its first safeguards agreement in the year 1977; signed the Non Proliferation of Nuclear Weapons "(NPT)" in 1985, and in 1992 signed its NPT Safeguards Agreement with the IAEA. Nuclear Safeguards are measures to verify that states do not use nuclear materials to develop weapons that stood with the vision at the core of IAEA establishment.

An event that changed history forever was the Chernobyl accident in 1986. The IAEA sole purpose has always been to highlight the implementation of nuclear safety conventions, combined with the industry standards and detailed national requirements, all to protect people and the environment in the world. Dana Drábová, Chair of the Czech State Office for Nuclear Safety, chaired in the 5th and 6th terms of the IAEA Commissions on Safety Standards from 2012 to 2019; his opinion on the Chernobyl accident was that several international conventions took more action on safety fundamentals in the 1990s.

Finally, on February 27th of 2023, the IAEA seeked to verify restarting an Unsafeguarded Facility in North Korea. At the time, according to numerous news reports the Democratic People's Republic of Korea restarted its nuclear reactor at Nyonbyong, the IAEA took action and said restarting the unsafeguarded facility showed the country disregard for its treaty obligations. The IAEA was not sure at the moment whether the Democratic People's Republic of Korea had restarted the reactor due to lack of inspectors; the Agency left with a message that said that the 35 member Board of Governors confirmed that Pyongyang safeguards agreement with the IAEA remains "blinding and in force".

In short, the actions had left a message that could transcend into more developed actions in the future. Every event that happened. Reveals the areas that still need to be addressed by International Committees around the world. The personal interests may be at stake, but after all the sole purpose of the "IAEA", after all, is to maintain its foundation present by finding peace within all.

V. POSSIBLE SOLUTIONS

Possible solutions

Establishing regulations surrounding the uses of nuclear energy is fundamental for keeping peaceful diplomatic relations, development, and security. That is why the following solutions were prepared, as they seek to reduce the unsupervised acquisition of nuclear weapons under the most fair and efficient terms.

I. Increased transparency regarding nuclear research.

a. A higher index of transparency removes a country's necessity to develop nuclear weapons, as data would show that no other country would be developing such. Citizens would also benefit from an increase in transparency, as the level of trust in governments would grow and increase cooperation as a whole at national and international scales.

b. There are different methods to increase transparency on a global scale, such as public budgets and disclosures, in which the government and high-ranking officials would be required to explain where the budget is headed and other areas of interest. Hearing the public's opinion on a subject can lead to decisions that benefit more people and target specific issues, helping transparency.

II. Harsher monetary sanctions on states that violate any nuclear-related treaty.

a. With harsher economic sanctions, countries will be less likely to develop or test nuclear weapons, as the sanctions imposed aim to damage a country's economy to prevent any future activities.

b. The sanctions would be imposed by UN and IAEA member states and would change depending on the severity of the situation. “The Global Sanctions DataBase classifies sanctions into 6 different types, namely trade sanctions, financial sanctions (e.g. limiting access to international payments mechanisms), travel restrictions, arms sanctions, military assistance sanctions, and “other” sanctions, (including sanctions on aid or transport)” (Morgenroth, 2023).

c. Many economic sanctions are in place nowadays, however, the effectiveness of such has shown evidence of being in decline, as the IAEA states in the research paper. The paper argues that sanctions don’t affect some countries because of different aspects, including having local firms that may not depend substantially on the global economy. Concerning this, the IAEA suggests that the effectiveness of sanctions may rise if international cooperation between all UN member states increases (Morgenroth, 2023).

III. Improve cooperation between the IAEA and other agencies and organizations.

a. Better cooperation between the IAEA and other agencies and organizations could better direct efforts to maintain a peaceful world. The IAEA is to function as a mediator in the case of any disputes regarding nuclear research, with the intervention of other bodies such as components of the UN.

b. This could be done by the signing of treaties and cooperation of the international community to promote organizations that mediate disputes and help countries develop. These treaties would obligate signatories to respect and follow the rules established by international organizations, which are ultimately backed by the countries themselves.

VI. COUNTRIES INVOLVED

1. The United States of America:

The United States of America became the first country to conclude a safeguards agreement with the IAEA, which covered four research reactors and intended to help the IAEA develop its safeguards methods. During the negotiation of the NPT (Non Proliferation Treaty), the United States committed to accept the same safeguards on its civil nuclear facilities that non-nuclear-weapons. This "voluntary offer" safeguards agreement (VOA), entered into force in the year 1980. "Under the VOA, the United States provides the IAEA with a list of civil nuclear facilities, excluding only those facilities of direct national security significance to the United States, which becomes eligible for the IAEA safeguards" (The International Atomic Energy Agency, n.d).

The IAEA may select any facility on this list for application of safeguards. As of December 2019, 274 facilities are on the Eligible Facilities List, and the IAEA applies safeguards at one facility, the K-Area Material Storage facility at the Department of Energy's Savannah River Site. Between 1981 and 2019, the IAEA conducted over 869 inspections at 19 facilities in the United States.

2. The Russian Federation

The Russian Federation joined the IAEA april 8th, 1957. For Instance, the Federation agreed with the 1966 Agreement on the Privileges and Immunities of the IAEA on July 1st, 1966, and agreed to participate in the Vienna Convention on Civil Liability for Nuclear Damage, signed in 1996, and by May 13, 2005 it passed. It signed the Convention on the Physical Protection of Nuclear Material in 1980, ratified in 1983, and accepted its 2008 amendment by 2016. The Convention on Nuclear Safety was accepted in 1996 , and the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management was agreed upon in the year 2006.

The Federation has not joined the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage or the Convention on

Supplementary Compensation for Nuclear Damage. Finally the Russian Federation maintains safeguards agreements with the IAEA from its USSR era, continuing into the Russian Federation on.

3. The People's Republic of China

The People's Republic of ”China has been a member of the IAEA since the year 1984, is involved in 93 IAEA technical cooperation projects, which spans national, regional and interregional activities” (*Director General Grossi [...]*, 2024) and 49 total coordinated research projects. It is home to seven other IAEA Collaboration Centres: Beijing Research Institute of Uranium Geology for geological disposal of high-level radioactive waste, which is China's Customs Radiation Detection Training Center for capacity building and facilitation of safe and secure trade using nuclear detection technologies. At the China Institute of Atomic Energy (CIAE), the main research institute of the China National Nuclear Corporation. China is one of the IAEA´s most important partners and a global leader in nuclear energy. There are more than 50 operational nuclear power units and 24 are under construction. By 2035, China's nuclear power generation will account for 10 percent of the country's electricity generation, according to the latest Blue Book of China Nuclear Energy Development Report.

Mr Grossi said. “This week’s agenda will cover the remarkable progress of China’s nuclear energy program, cooperation in nuclear applications, and indispensable exchanges on non-proliferation and nuclear safety” (Liou, 2023). China has more than 50 operational nuclear power units and 24 are under construction.

4. The Democratic People's Republic of Korea

North Korea joined the International Atomic Energy Agency (IAEA) in 1974, and between 1975 and 1979 had a nuclear scientist stationed at the IAEA´s head office in Geneva. The scientists' key role was to gather information from the agency in order to learn how to design nuclear reactors. In 1980, North Korea was able to build a reactor that could produce weapons-grade plutonium. In the decades

since then, the reactor has since generated power sufficient for only 23 days of electricity, leading Pollack to the conclusion that right from the beginning the regime had other uses for the reactor in mind., which led Pollack that the regime had other uses for the reactor in mind. The United States of America began to take the North Korean nuclear program seriously, the pursuit of a nuclear deterrent was already “rooted in the identity” of the North Korean nuclear system. There was no forward engagement of the United States of America with The Democratic People's Republic of Korea until the 1990s.

5. State of Israel

The State of Israel joined the IAEA on July 12, 1957. As of the year 2024, The State of Israel strongly supports the important ZODIAC initiative, which is a program of action for Cancer Therapy (PACT). IAEA's role in leading innovative nuclear applications to confront these challenges are present. The State of Israel commend the Department of Nuclear Sciences and Application initiative to renovate IAEA Nuclear Applications laboratories in Seibersdorf. The Government of Israel decided to make an extra budget contribution to support the Agency in their efforts to upgrade the remaining laboratories that have not yet been modernized.

“Israel supports the essential role of the IAEA in the verification and monitoring of Member States' nuclear obligations. Israel has full confidence in the professional technical capabilities of the Agency” (*Statement by Israel,* n.d.) which formerly involved the Iranian nuclear program. The numerous regular and special reports by the Agency reflects that Iran remains in serious non-compliance with its safeguards obligations. Iran´s constant failure to provide credible explanations for traces or uranium found at undeclared massive sites in which it is found is a serious concern.

6. The United Kingdom of Great Britain and Northern Ireland
7. French Republic
8. Republic of India

9. Islamic Republic of Pakistan
10. Republic of Kazakhstan
11. Ukraine
12. Islamic Republic of Iran
13. Republic of South Africa
14. State of Japan
15. Commonwealth of Australia
16. Federal Republic of Germany
17. Republic of Korea
18. Dominion of Canada
19. Republic of Poland
20. Federal Republic of Nigeria
21. United Mexican States
22. Republic of Chile
23. Federative Republic of Brazil
24. Republic of Namibia
25. Republic of Niger

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