International Atomic Energy Agency: The Nuclear Future

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Delegates,

I am so excited to welcome you all to Michigan State University for the twentieth session of the Michigan State University Model United Nations! My name is Emily McHarg and I will be the chair of the International Atomic Energy Agency: The Nuclear Future. For this conference, we will be debating extremely critical energy and security issues including nuclear non-proliferation, nuclear safety and advances in nuclear technology.

However, I want to take some time to introduce myself as well as my great staff. I am currently a senior at James Madison College, where I study for International Relations with minors in German and Women and Gender Studies. I am from Romeo, Michigan and I’ve been involved in MUN for three years. This is my first year chairing at MSUMUN, but last year I was an Assistant Chair for the UN Commission on the Status of Women. In addition to MSUMUN, I am also on the Executive Board of MSU’s International Relations Organization (IRO), which is MSU’s competitive travel Model UN team and the sister organization of MSUMUN. When I’m not doing MUN (which is rare!), I enjoy listening to podcasts, talking politics, watching Game of Thrones, or stressing about graduating! Feel free to come talk to me with any questions you might have about college or MUN!

Jack Boyce is currently a Junior at MSU in the James Madison Program studying International Relations and Political Theory. Model UN has been a part of my life since my sophomore year of high school, and in my time at MSU, I have been a member of MSUMUN and her sister organization, the International Relations Organization. Outside of Model UN, I am an active member of the Izzone - the student section at every MSU basketball game - and an avid MSU hockey fan. The James Madison College at MSU together with MSUMUN and IRO have worked in conjunction for the last three years of my education to combine curriculum with experience and I would actively invite any prospective freshman interested in coming to MSU to ask me any questions they may have on the college.

Camden Smith is a freshman in the James Madison college majoring in Comparative Cultures and Politics. I love participating in Model UN because it is a fun and easy way to learn about the world, and because it is a great way to meet great people. In my free time I like to play Settlers of Catan with my friends and watch basketball.

If you have any questions about the background guide or this committee, please feel free to email me at specialized1@msumun.org. Good luck and I look forward to meeting everyone!

Best,
Emily McHarg
History of the International Atomic Energy Agency (IAEA)

On December 8th, 1953 President Dwight Eisenhower delivered his “Atoms for Peace” speech in front of the General Assembly at the United Nations in New York. Eisenhower’s speech proposed the creation of an international agency tasked with sharing nuclear information and protecting the world from the power of the atom. Eisenhower spoke about working with the USSR, and invited the USSR to “make joint contributions from their stockpiles of normal uranium and fissionable materials” … “to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind.”

Under the IAEA, the US and USSR, along with other countries would use atomic energy for agriculture, medicine, and to bring electrical energy to the “power-starved areas of the world” while preventing the further proliferation of nuclear weapons.

The IAEA was formalized with the adoption of the Statute of the IAEA on October 23rd, 1956 by 81 Member States, and came into effect on July 29th, 1957 when the U.S. ratified it. This independent international organization reports to the UN General Assembly and the United Nations Security Council. As of February 5th, 2019, the IAEA has 171 member states.

To become a member, states do not have to be a signatory or ratify the Nuclear Proliferation Treaty (NPT), rather states usually just notify the Director General of its desire to join, and then the Director General would submit an application to the Board for consideration. To date, four states

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2 Ibid.


4 Ibid.
have withdrawn their membership from the IAEA: North Korea, Nicaragua, Honduras, and Cambodia. Only North Korea has not rejoined.

The three pillars of the IAEA’s mission are safety and security, science and technology, and safeguards and verification. For its science and technology mission, the IAEA “assists its member states in using nuclear science and technology for peaceful purposes and facilities the transfer of such technology and knowledge in a sustainable manner to member states.” The IAEA has even aligned itself with nine of the seventeen Sustainable Development Goals (SDGs), specifically: zero hunger, good health and well-being, clean water and sanitation, affordable and clean energy, industry, innovation and infrastructure, climate action, life below water and life on land. Countries can use nuclear science and technology to meet their SDGs, especially in the areas of energy, human health, food production, water management and environmental protection. For its safety and security mission, the IAEA “promotes a strong and sustainable global nuclear safety and security framework”, specifically in the areas of nuclear installation safety, radiation protection, radioactive waste management and severe accident management.

For its last mission, the IAEA verifies that member states honor their international legal obligations to use nuclear materials and technology only for peaceful purposes, and to prevent the spread of nuclear weapons. While the IAEA is a largely respected international agency, it has drawn criticism for its responses to Chernobyl and Fukushima. Under this framework of the IAEA, you must respond to the following issues. A resolution should adequately address

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**Topic A: Nuclear Non-Proliferation**

As the world has seen the dangers of nuclear weapons, there has been a push to pursue nuclear non-proliferation internationally and domestically. The IAEA has recognized treaties with the goal of pursuing non-proliferation, but there are still issues that need to be addressed. Currently, there are nine countries that still have nuclear weapons and other countries have been suspected of pursuing nuclear weapons programs. It is possible for countries to voluntarily abandon their nuclear weapons programs, including Argentina, Brazil and Egypt. Furthermore, Iraq, Libya, South Korea and Syria were forced diplomatically or militarily to give up their pursuits of nuclear weapons programs. Even Belarus, Kazakhstan and Ukraine gave up their nuclear weapons which they inherited after the USSR’s collapse, and South Africa unilaterally eliminated their own small arsenal. Thus, there are paths to non-proliferation including diplomacy, military action, and voluntary abandonment, but the security risk of a major power giving up their nuclear weapons may be too great, if smaller regional powers do not also pursue non-proliferation seriously.

**Limits on Strategic Nuclear Weapons**

When considering the limits the international community has placed on nuclear weapons, it is important to distinguish between two different ‘bins’ of limits: disarmament and arms control. The goal of disarmament is the reduction or elimination of the amounts of arms and the types of weapons employed and arms control agreements target restriction on the research, manufacture, or deployment of weapons systems. The first of the treaties limiting nuclear weapon use is the Nuclear Non-Proliferation Treaty (NPT), which was signed in 1968 and entered into force in 1970. The NPT’s goal was to limit the number of nuclear weapons tests nations were pursuing with their nuclear weapon research. The treaty has three pillars: non-proliferation, peaceful use, and disarmament. The first pillar stipulates that nuclear countries will
not transfer nuclear weapons and technology, and prohibits non-nuclear countries from developing such weapons. The second pillar allows for transfer of nuclear technology only if the transfers are transparent and monitored by the IAEA, and the last pillar focuses on the general good faith disarmament of the nuclear countries at its signing. Post NPT treaty there are three Nuclear Test-ban treaties - 1963 the partial test ban treaty, the 1974 threshold test ban treaty, and the 2006 comprehensive test ban treaty.

With the partial test ban treaty, the international community decided to ban nuclear testing in the atmosphere, outer space, and underwater. What was clearly missing from the partial test ban treaty was a moratorium on underground testing, and this loophole was fixed with the Threshold Test Ban, which expressly banned underground testing of nuclear weapons. In 2006, the international community once again came together to limit the use of nuclear weapons and banned nuclear explosions entirely with the Comprehensive Nuclear Test Ban Treaty. The treaty has not come into force as of 2019, as there are currently eight states that have yet to ratify it, including China, the DPRK, Egypt, India, the Islamic Republic of Iran, Israel and the United States.

Current challenges facing this committee are: 1) the failure of the nuclear 5 countries (US, UK, China, France and Russia) to pursue disarmament. While disarmament have been domestic policy platforms and goals in each country, zero of the five countries have successfully undergone denuclearization to become nuclear-weapons-free. While proponents of nuclear disarmament argue that the risks of nuclear war occurring, even accidentally, would be much lower, critics say that deterrence would be undermined. Thus, it is unlikely for these nations to abandon their nuclear weapons while other nations keep theirs. Another challenge is 2) countries being able to cheat on their commitments to the IAEA or the IAEA lacking in its budgetary
capacity to fully monitor countries’ activities. In addition, another challenge is 3) nuclear armed states that have not signed onto the NPT including India, Israel, South Sudan and Pakistan while the DPRK has withdrawn. For India, Israel and Pakistan to join the treaty, they would have to do so as a non-nuclear weapon state (NNWS) as the treaty restricts nuclear weapon state (NWS) status to the states which "manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967". Therefore, joining the NPT would require dismantling nuclear weapons and placing nuclear material under international safeguards. One last challenge is 4) how non-state actors are not covered by the NPT and other nuclear limit regimes. While a non-state actor pursuing a nuclear weapons program is unlikely, it is still possible, and international treaties and IAEA safeguards do not cover the actions of these non-state actors.

Nuclear Disarmament

One cannot understand the current global nuclear regime without first understanding the implications of the Nuclear Non-Proliferation Treaty mentioned above as it was the first treaty that recognized and defined the separation of the five nuclear states and the rest of the non-nuclearized world. The five states that acknowledged their nuclear weapons at the time of signing were: France, China, Russia, United Kingdom, and the United States, and this treaty outlawed the transfer of nuclear weapons technology from any of these five nations to any of the other non-nuclear countries. According to the Nuclear Threat Initiative (NTI) there are

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10 Ibid.

currently nine states - U.S, U.K, France, Russian Federation, China, India, Israel, Pakistan, and North Korea - with approximately 14,000 total warheads between them and about 4,000 on active deployment - with around 150 US tactical nuclear weapons deployed to five NATO countries as well\textsuperscript{12}. While the NPT has not necessarily stopped the nuclear nations from allowing weapons transfers, there are currently four cases in which countries had nuclear weapons and subsequently destroyed their programs. In 1993, South Africa did so and signed the NPT and in the mid 1990’s Belarus, Kazakhstan and Ukraine also got rid of their stockpiles as well\textsuperscript{13}. The NPT also successfully stymied two separate attempts from countries attempting to develop nuclear programs, such as Brazil and Argentina in 1994-95, respectively\textsuperscript{14}. The most significant step taken by the international community in the mission of disarmament was the 2017 adoption of the Treaty on the Prohibition of Nuclear Weapons, which bans the development, acquisition, test, use, threat of use, and possession of Nuclear weapons. Since coming into force in 1970, every five years, the member states of the NPT meet in New York to review how the treaty is operating and the 2017 Treaty on the Prohibition of Nuclear Weapons builds on the shoulders of the 2000 NPT review conference, where for the first time in the history of the NPT, the Nuclear Weapons States (NWS) agreed to “the total elimination of their nuclear arsenals.”

The breakdown of nuclear weapons by global region are shown in table one. While the data shows that nuclear weapons are dispersed throughout the world, out of the 13,885 nuclear weapons, 44% (6,775) are in the hands of US allies. Major nuclear disarmament treaties include

\textsuperscript{12} Kelsey Davenport, Arms Control Association, July 2019, \url{https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat}

\textsuperscript{13} Robert Einhorn, “Non-Proliferation Challenges Facing the Trump Administration,” Brookings Institute, March 2017, \url{https://www.brookings.edu/research/non-proliferation-challenges-facing-the-trump-administration/}

\textsuperscript{14} Ibid.
the Strategic Arms Limitations Talks - I and II - (SALT), which limited the amount of deployed strategic nuclear weapons between the USSR and Russia, and the recent Join Plan of Comprehensive Action (JCPOA) which returned the Islamic Republic of Iran to Non-Proliferation Treaty compliance. The SALT talks took place during the Johnson administration in the late 1960’s with the purpose of specifically limiting anti-ballistic missile systems (ABMs) in both the US and the USSR\(^\text{15}\). The role of ABM’s was to “allow one side to launch a first strike and then prevent the other from retaliating by shooting down incoming missiles”\(^\text{16}\). Both parties realized that it was unrealistic to expect total nuclear disarmament in both nations, but they also realized that relations between nations could be stabilized with limiting development of nuclear weapons that could be used offensively or defensively. Under the Nixon administration, the focus shifted to submarine based ballistic missiles on top of the existing friction between growing numbers of ABMs\(^\text{17}\). The SALT I treaty concluded under Nixon reduced the amount of ABMs to 200 each, and each side was allowed two missile defense sites - one at their respective capitals, and the other to protect an ICBM field\(^\text{18}\). However, while the treaty was the first time the two most nuclear armed nations in the world agreed to limit some aspect of their militaristic position vis-a-vis the other, however, notable exceptions to the SALT I treaty include the outstanding number of strategic bombers and the total number of warheads each nation possessed\(^\text{19}\).


\(^{16}\) Ibid.

\(^{17}\) Ibid.

\(^{18}\) Ibid.

\(^{19}\) Ibid.
Beginning in 1972, the SALT II treaty had the goal of limiting Multiple Independently Targeted Reentry Vehicles (MIRVs), which were placed onto already existing ICBMs. The goal of the negotiations were to limit the qualitative breakthroughs that could have had the potential to destabilize the relationship between countries. In November of 1974, President Ford and Soviet Premier Breshnev created the general boundaries of the negotiations, under which they believed they could limit ‘strategic nuclear delivery vehicles’ - including ICBMs, SLMBs, and heavy bombers - to 2,400, a limit of 1,320 MIRV devices, a ban on land based ICBM launchers, and a limit of strategic offensive arms. The SALT II negotiations spanned three administrations and ended successfully in 1979 but not without significant US domestic political dissent. On December 25 of that same year, the Soviets entered Afghanistan, and Carter asked Congress to not ratify the agreement. However, President Reagan - Carter’s successor - was opposed to the SALT II treaty, but adhered to it until its expiry date of December 31, 1985, after which the US and the USSR entered into the first phases of the Strategic Arms Reduction Treaty (START) negotiations.

The START I negotiations began under the Reagan administration in 1982 and wasn’t signed until 1991 under the H. W. Bush administration, just five months before the eventual collapse of the Soviet union. Post collapse, the four remaining nuclear armed states that were formerly members of the Soviet Union - Russia, Belarus, Ukraine, and Kazakhstan - were made member to the START treaty through the 1992 Lisbon Protocol. The terms of the START treaty


22 Ibid.
limited the five member states to: 1,600 deployed ICBM, submarine launched ballistic missiles and long range bombers, 6,000 total nuclear warheads for ICBMs but no more than 4,900 actively attached, and a limit on the lifting power of ICBMs of 3,600 metric tons. The treaty represented legitimate limitations on countries warheads and capabilities, rather than just limitations on weapons.

The START II treaty picked up exactly where the START I treaty ended in 1991 with the goal of maintaining the structure and goal of the START I treaty and continue limiting strategic nuclear weapons in two phases. Phase one was an introductory phase for Russia and the US to reduce arms to a certain quantitative limit, and phase two required countries to eliminate all heavy ICBMs. An important feature of the START treaties were their verification features, and under the START II treaty, the verification of the elimination of the heavy ICBMs and their silos was added to a verification regime which already included on-site verification.

The Joint Comprehensive Plan of Action (JCPOA) which entered into force in 2015, was a nuclear disarmament pact between the P5 (US, China, France, UK, and Russia) plus Iran to reduce Iran’s nuclear development program and increase inspections of declared nuclear sites for reduction in economic sanctions. Pre-JCPOA, Iran had been able to develop its nuclear capabilities for nearly two decades despite being a member of the NPT. The JCPOA was endorsed by a UN resolution, and the inspections Iran had agreed to would be executed by the International Atomic Energy Agency in random intervals. The JCPOA has a shelf-life of ten years after the full implementation of the treaty, which will give it an expiry date of October 2025. The JCPOA has encountered a major shake up with the loss of one of the P5 members that negotiated the treaty originally - the US. On May 8, 2018, President Trump announced that the

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United States would no longer be a party to the JCPOA and US economic sanctions on Iran would come back into force.

**Nuclear Weapons Free Zones**

Nuclear weapon free zones (NWFZ) are specific regions in which countries commit not to manufacture, acquire, test or possess nuclear weapons. There are five NWFZ around the globe in accordance with the NPT which require the regional parties to complete comprehensive safeguard agreements with the IAEA. Article VII of the NPT established the right of countries to have specified zones free of nuclear weapons; however, within these zones, countries can still use nuclear energy for peaceful purposes. The five treaties that establish the NWFZ are: the 1967 Treaty of Tlatelolco covering Latin America, the 1985 Treaty of Rarotonga covering the South Pacific, 1995 Treaty of Bangkok covering Southeast Asia, the 1996 Treaty of Pelindaba covering Africa and the 2006 Treaty of Semipalatinsk covering Central Asia. In addition to these NWFZ treaties, the Antarctic Treaty, the Outer Space Treaty, the Moon Agreement and the Seabed Treaty prohibits the placement of nuclear weapons in the aforementioned areas. The basic elements of NWFZ treaties are duration, conditions, verification and territory covered. The five treaties are in place indefinitely, but there are withdrawal options. The Treaty of Tlatelolco requires three months’ advance notice, but all other NWFZ treaties require 12 months’ advance notice to withdrawal.

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25 Ibid.

26 Ibid.

27 Ibid.

28 Ibid.
NWFZs are a concrete contribution to the goal of global nuclear disarmament. There is interest in establishing new NWFZs in the Middle East and in the Arctic. On December 9th, 1974 the UN General Assembly passed Resolution 3236 which called for a Middle East NWFZ; however, no agreement has ever been reached\(^\text{29}\). Currently, Israel has an unconfirmed, but widely acknowledged nuclear program, Iran has a nuclear program and Syria has pursued a nuclear program in the past. Israel maintains that an Israeli-Arab peace settlement is a necessary precondition for a NWFZ in the Middle East\(^\text{30}\). Logistically, the creation of a NWFZ in the Middle East would require Israel to join the NPT and dissolve its nuclear weapons program.\(^\text{31}\) However, Arab States in the region see Israel’s possession of nuclear weapons as an obstacle to peace and security in the region. Western countries, including the US and Canada have even blocked proposals brought forward by Middle East States\(^\text{32}\). Political and historical circumstances in the Middle East render a NWFZ unlikely, however, that does not mean the international community cannot continue to pursue this goal.

However, a NWFZ in the Arctic may not be any easier to establish. As climate change continues to affect the Arctic region, security concerns in the region are becoming increasingly important for the eight member states of the Arctic Council: Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States. The interests of indigenous peoples are also vital to acknowledge in the region. In 1977, 1983 and 1998, indigenous peoples proposed and


\(^{30}\) Ibid.


\(^{32}\) Ibid.
endorsed an Arctic NWFZ.\footnote{Ernie Regehr. “A Nuclear-Weapon-Free Zone and Cooperative Security in the Arctic”. \url{http://www.thesimonsfoundation.ca/sites/default/files/A%20Nuclear-Weapon-Free%20Zone%20and%20Cooperative%20Security%20in%20the%20Arctic-DAS%2C%20October%202014%202014_1.pdf}} During the Cold War, the Arctic was used by both the US and the USSR as a testing and storing site for nuclear weapons. Only Russia currently uses the Kola Peninsula in the Arctic as a nuclear weapons base, and there have been reports that Russia still uses the island of Novaya Zemlya for nuclear testing.\footnote{Ibid.} However, China, France, Russia, the UK and the US have the capability to bring nuclear weapons to the Arctic via submarines equipped with ballistic missiles.\footnote{Ibid.} Issues with an Arctic NWFZ include determining geographically what the Arctic includes and what that means for the Kola Peninsula. Radioactive waste dumping in the region is another issue as the Arctic NWFZ could be expected to follow the Rarotonga Treaty by prohibiting such activity.\footnote{Ibid.} The status of the Arctic Ocean in a possible NWFZ also presents questions as nuclear weapons states might consider not deploying nuclear-armed submarines to the Arctic Ocean. However to truly denuclearize the Arctic Ocean, all states throughout the globe would have to agree to not operate or station nuclear weapons in the Arctic Ocean.

**The Risk of Proliferation**

Among the top threats that exist in the realm of nuclear weapons is the potential for non-nuclear countries to develop nuclear weapons. Perhaps the largest current threat to the nuclear order of the world is the Iranian Nuclear program. After an agreement was reached over Iran’s nuclear program in 2015, it seemed that the threat of an Iranian nuclear program was a thing of the past. Since taking office current U.S. President Donald Trump has backed the U.S. out of the
Iran nuclear deal. The increasingly sour relations between the two countries has led to a great deal of concern over the potential for Iran to reactivate their nuclear program. A special report by the BBC has stated that the IAEA has found a small amount of Uranium at an undeclared site. The IAEA’s report also confirmed Iran had resumed uranium enrichment at its underground Fordo facility, which violated another commitment made in its landmark 2015 nuclear deal with world powers. Enriched uranium can be used to make reactor fuel but also nuclear weapons. While the threat of Iran developing a nuclear weapon is an issue of great concern, there are also concerns that non-state actors such as terrorist groups could steal nuclear weapons from more vulnerable nations.

According to the Belfor Center for Science and International Affairs a terrorist organization could create a makeshift nuclear weapon with just 25 Kg of heavily enriched Uranium. The implications of a terror organization acquiring a nuclear weapon could be global catastrophe. There would be no need for a missile delivery system for the weapon, it could be driven into a city and detonated causing a humanitarian catastrophe of unparalleled scale. It is because of the threats of terrorist groups acquiring nuclear weapons and because of the geopolitical implications of states acquiring nuclear weapons that there are treaties in place to prevent proliferation of nuclear weapons.

Resolution and Questions to Consider

Keeping in mind the aforementioned challenges to nuclear proliferation, how will your country approach non-proliferation? In a resolution, this committee should address loopholes in these treaties, and any additional considerations that you may think are necessary. There are

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many different ways to approach this topic. Remember there are security implications, civilian concerns, the opportunity to strengthen safeguards, and climate change challenges. Here are some questions to consider:

1. What is your country’s stance on nuclear weapons and nuclear proliferation? How could your country or a bloc of countries persuade other countries to pursue nuclear non-proliferation, or to join the NPT?

2. How can the IAEA continue to pursue peaceful uses of nuclear material and technology with updated technology?

3. How should the IAEA address the security risks associated with the Arctic? Should climate change be a consideration?

4. How should the IAEA continue to protect the world against non-state actors and nuclear terrorism? How would your country respond to a crisis?

**Topic B: Nuclear Safety**

Nuclear safety is important not only for civilian safety, but also to protect the Earth against damage from radioactive waste, nuclear weapons testing or nuclear plant meltdowns. This committee must be ready to address those concerns at a moments notice.

**Nuclear Weapons Testing**

Since 1963 there has been a partial ban on nuclear testing\(^{39}\). Upon ratification of the Partial Nuclear Test Ban the United States, United Soviet Social Republic and the United Kingdom promised to no longer detonate nuclear weapons anywhere but underground\(^{40}\). This


\(^{40}\) Ibid.
treaty was ratified to prevent damage to the environment that atmospheric or underwater nuclear tests cause\textsuperscript{41}. Nuclear test in both the air and the ocean can be incredibly harmful\textsuperscript{42}. The detonation of a nuclear warhead releases large amounts of radioactive material into the surrounding area causing major health problems for humans, plants, and animals\textsuperscript{43}. During the arms race that lasted for the second half of the 20th century, countries used nuclear tests as a way to demonstrate their power to adversaries abroad\textsuperscript{44}. The detonation of a nuclear warhead by a state displays a power to the world that can only be rivaled by other nuclear weapons\textsuperscript{45}. Countries use these displays of power to cement their power in their region, or in the world as a whole\textsuperscript{46}. From 1945 to 2006 an estimated 2053 nuclear tests have been conducted\textsuperscript{47}. Atmospheric nuclear weapons testing involves the release of considerable amounts of radioactive materials directly into the environment. The radiation emitted from a nuclear weapons tests is still a health threat today. As estimated 2.4 million people will die from radiation due to the nuclear tests that occurred between 1945 and 1980\textsuperscript{48}.

The Nuclear age began in 1945 with the US “Trinity” test. The Trinity test was the result of the top secret Manhattan Project conducted during World War II\textsuperscript{49}. Soon after the United

\textsuperscript{41} Ibid.
\textsuperscript{42} Ibid.
\textsuperscript{43} Ibid.
\textsuperscript{44} Ibid.
\textsuperscript{45} Ibid.
\textsuperscript{46} Ibid.
\textsuperscript{47} Ibid.
\textsuperscript{48} Ibid.
States’ Trinity test, the USSR conducted the “First Lightning” test in 1949 and India tested its first nuclear weapon in 1974. Since the 1974 tests the villages around the testing site have experienced increased levels of cancer and mutations\(^50\). This spike in cancer and mutations are caused by radiation from nuclear tests contaminating ground water.\(^3\) On top of contamination of groundwater crops in the region died following the nuclear tests, and these problems only increased following the 1988 test of several nuclear weapons.\(^3\) Exposure to radioactive material fallout can occur from direct skin contact with fallout particles in the air or particles that fell on the ground and later came into contact with the skin, from ingesting radioactive fallout from food or drink and from breathing in radioactive material in the air\(^51\). These concerns must still be addressed by this committee.

The 1996 Comprehensive Nuclear Test Ban attempted to ban all nuclear explosions, both for civilian and military purposes, in all environments; however, it is currently not in effect. There are 8 states (China, Egypt, Iran, Israel, US) that have not ratified, and 3 states (India, North Korea, Pakistan) that have not signed or ratified, blocking it from going into effect\(^52\). This treaty could prevent further environmental damage from the currently legal practice of underground testing. When a nuclear bomb is detonated underground, the rock surrounding the weapon is vaporized. Rock lying further from the bomb is melted as temperatures rise by several million degrees. In many cases, the ground above collapses into the molten cavity, allowing

\(^{50}\) Ibid.


radiation to spread into the atmosphere and surrounding environment.\(^{53}\) In addition to testing weapons themselves, many nuclear powers are testing the delivery systems for their nuclear weapons that they have stockpiled\(^ {54}\). Russia has plans to arm submarines with nuclear torpedos capable of traveling underwater to their target\(^ {55}\). The arms race is far from over even though the Cold War has ended. All nations with nuclear arsenals still attempt to develop a more powerful means of transport for their warheads.

One of the issues this committee is faced with is the enforcement of the Partial Test Ban Treaty, while continuing to pursue ratification of the Comprehensive Test Ban Treaty. Nuclear weapon states are still testing nuclear weapons. For example, in 2014, President Obama accused Moscow of restarting nuclear weapons testing. In addition, North Korea conducted its sixth nuclear weapons test in 2017, which resulted in an earthquake with a magnitude of 6.3 reported by the US Geological Survey.\(^ {56}\) There is also controversy over what occurred with the Russian Nyonoksa radiation accident in August of 2019, which left 9 dead. In terms of ratifying the Comprehensive Test Ban Treaty, 44 states must ratify, which means that 8 more states must. However, domestic political opposition may render this difficult to achieve. Overall, nuclear weapons testing has serious safety concerns which need to be addressed.

**Nuclear Waste Disposal**


\(^{55}\) Ibid.

Radioactive nuclear waste is a byproduct created from nuclear weapons manufacturing and nuclear energy power plants. There are different types of waste including low-level waste, intermediate waste, high-level waste (HLW) and spent fuel rods. Low-level waste can be compacted or incinerated while intermediate waste can be solidified in concrete or bitumen and then buried underground. HLW poses a greater threat as it comprises only 3% of the total volume of nuclear waste but contains 95% of the radioactivity from nuclear power. To dispose of HLW, it can be turned into glass, a process called vitrification, and then buried, or it can just be stored in underground silos. Depending on the type of waste, radioactivity can last from a few hours to hundreds of thousands of years. Proper disposal is necessary to avoid damage to the environment, especially the atmosphere, as radioactive waste can raise atmospheric temperature, which can contribute to problems associated with climate change.

There are many different methods to dispose of nuclear waste including geological disposal, where the waste is buried so far into the ground that is out of human reach. Within this method, there are many different types of geological disposal depending on the type of nuclear waste and the length of possible radioactivity. For example, there is near-surface disposal, deep geological disposal, mined repositories and deep boreholes. One example of deep geological disposal is Yucca Mountain in Nevada, which was designated in 1987 as a storage facility for spent nuclear fuel and HLW. However, because of civilian pushback and political pressure, the project has never been completed, leaving the US without any long-term...
disposal plans. In contrast, Finland is currently building the first repository for the final disposal of HLW, called the Onkalo spent nuclear fuel repository\textsuperscript{63}. Both Canada and the UK have started the selection process to pick geological repository sites\textsuperscript{64}. However, not all countries have the individual capacity to build their own repositories so it has been suggested that multinational or regional repositories could be established. This repository could be operated by a private multinational company or by the IAEA itself. However, national laws depending on the country would prohibit many countries from accepting a different country’s nuclear waste.

Other methods for nuclear waste disposal include: reprocessing, vitrification and space disposal. Reprocessing is a method that includes extracting fissile materials from the usable uranium in the spent nuclear fuel so that fresh fuel is available to be used. Russia, China and Japan all have policies to reprocess nuclear fuel\textsuperscript{65}. The fissile material that is not usable can be converted into glass through a process called vitrification, and only has to be stored in a repository for 500 years compared to hundreds of thousands of years for untreated fuel. Another possible method for disposal is space disposal, where nuclear waste would be put on a space shuttle and launched into space. There are not only practical and economic issues with this method, but also issues that concern the IAEA as nuclear testing is prohibited in space, so the question of what is allowed in space needs to be answered.

In addition to actual disposal methods, countries faced with the problem of radioactive nuclear waste lasting hundreds of thousands of years are faced with a moral problem about how to alert future generations. This question was first posed in 1981 to a panel of scientists at the U.S. Department of Energy, where the panel reasoned that creating written warnings for future

\textsuperscript{63} Ibid.
\textsuperscript{64} Ibid.
\textsuperscript{65} https://www.world-nuclear.org/nuclear-basics/what-are-nuclear-wastes.aspx
generations could be difficult as few people today can understand texts written thousands of years ago. One possible solution is not mark any sites where any nuclear waste is stored and hope that future generations do not stumble upon them. Another solution includes creating a universal, timeless warning as the field of nuclear semiotics explores. Genetically modifying cats to change color when exposed to radioactive material has also been proposed, which could be done by “engineering cats to glow using an enzyme reaction.” Cats have historically have lived alongside humans and are associated with bad omens in many cultures.

**Nuclear Power Plant Meltdowns**

Nuclear power plants are one of the greenest forms of energy, which they create by “initiating and controlling a sustained nuclear chain reaction.” There are over 400 nuclear power reactors in 30 countries, which creates 11% of the world’s electricity. There are many different types of nuclear energy plants: water cooled reactors, gas cooled reactors, fast reactors, molten salt reactors and small modular reactors. While nuclear energy is safe, there are many public concerns about using nuclear energy or having a nuclear energy reactor near communities. There are possibilities for nuclear energy power plants to meltdown including what happened at Three Mile Island, Chernobyl and Fukushima. This committee must be able to mitigate the public’s concern about nuclear reactors, respond to a meltdown if necessary and create policies to prevent future meltdowns.

**Past Meltdowns**

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67 Ibid.

68 IAEA

69 IAEA
In 1979, at the Three Mile Island nuclear power plant near Harrisburg, Pennsylvania, USA, the second reactor was destroyed because of a cooling malfunction which caused the reactor to meltdown. As nuclear reactors are path dependent, if anything goes wrong, the system has built-in safeguards to stop the process. In the second reactor at Three Mile Island, a malfunction in the cooling circuit caused the temperature in the primary coolant to rise and the reactor shut itself down automatically to avoid a further problem. However, a relief valve failed to close, which was not reported on the system, which caused the core of the nuclear reactor to suffer great damage. There was widespread panic and confusion over the events that occurred at Three Mile Island. However, studies have found that radiation releases during the incident were minimal and long-term studies have shown that there is no adverse health effects for people living in the area. Clean-up measures took 12 years and cost the US $973 million dollars. The IAEA reported that Three Mile Island was a turning point in the global development of nuclear power, and that following the incident, the number of reactors under construction in America decreased every year for nearly two decades.

One of the most notable meltdowns was Chernobyl in 1986, where a meltdown caused “a huge release of radionuclides over large areas of Belarus, Ukraine and the Russian federation.” It is considered one of the worst nuclear disasters in history. The incident started during a safety test on an RBMK-type nuclear reactor to simulate an electrical power outage, which was the fourth attempt of this test. There were issues with the test which was supposed to shut down the 

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71 Ibid.
72 Ibid.
73 Ibid.
74 Ibid.
76 Ibid.
reactor, but instead an uncontrolled nuclear chain reaction occurred, leading to damage and a fire\textsuperscript{77}. There was an immediate evacuation followed by the creation of an exclusion zone\textsuperscript{78}. Two of the operating staff at the reactor were killed because of the explosion, and 134 firemen and station staff were hospitalized with acute radiation syndrome\textsuperscript{79}. 28 died after the initial incident, 15 cases of childhood thyroid cancer deaths were documented as of 2011, and the United Nations Scientific Committee on the Effects of Atomic Radiation has found that fewer than 100 documented deaths are likely to be attributable to increased exposure to radiation presently. However, there are still radiation dangers associated with the area\textsuperscript{80}.

In 2011, an earthquake and tsunami caused an active reactor in Japan to automatically shutdown\textsuperscript{81}. Further complications led to nuclear meltdowns, hydrogen explosions and the release of radioactive contamination. The Fukushima nuclear disaster caused social, economic, environmental and public health consequences. 15,891 people died and 2,579 people went missing as a consequence\textsuperscript{82}. In addition, nearby soil was damaged, harmful isotopes were released into the atmosphere and into the ocean, which is harmful to marine animals and human consumers\textsuperscript{83}.

With these three disasters in mind, this committee must be able to prevent future nuclear disasters through emergency response measures. This includes “assisting Member States in building the capacity for emergency response, and maintaining the IAEA Incident and

\textsuperscript{77} Ibid.
\textsuperscript{78} Ibid.
\textsuperscript{79} Ibid.
\textsuperscript{81} Catherine Dong, “The Environmental Impact of the Fukushima Nuclear Power Plant Disaster,” Stanford (Stanford, March 5, 2016), http://large.stanford.edu/courses/2016/ph241/dong1/)
\textsuperscript{82} Ibid.
\textsuperscript{83} Ibid.
Emergency System to efficiently implement its role in response to nuclear or radiological incidents and emergencies”\textsuperscript{84}.

**Resolution and Questions to Consider**

A resolution for this topic should address nuclear safety concerns in terms of civilian safety both physical safety and health concerns. It should also address environmental problems from nuclear testing and nuclear waste. This committee should address loopholes in the aforementioned treaties, and any additional considerations that you may think are necessary. Please keep in mind that there are international security issues still at stake in this topic, especially for nuclear weapons testing and nuclear waste depositories. Keep the following questions in mind while doing research:

1. What is your country’s stance on nuclear testing? How could your country or a bloc of countries persuade other countries to ratify the Comprehensive Test Ban Treaty?

2. Does your country have any nuclear waste depositories? Is your country pursuing any new technology for nuclear waste disposal?

3. Does your country rely on nuclear energy? Are there any domestic political concerns over nuclear energy, if so, how does the government respond? How would your government respond in an emergency situation?

**Topic C: Nuclear Terrorism**

While experts disagree over how real the threat of nuclear terrorism is, it is vital for this committee to address these challenges in case of any crisis or emergency situations. A number of terrorist groups including ISIS and al-Qaeda have expressed their desire to acquire and use nuclear material, while conventional weapons still pose a more realistic threat, nuclear terrorism is a pressing concern to many countries and to civilians.\(^{85}\) One way for this committee to address nuclear terrorism is through the strengthening of safeguards to discourage the misuse of nuclear material, but this is not the only method of action. Targeting networks and the spread of nuclear material on the black market network is also a possibility, and please remember to utilize other organizations that are also addressing these concerns.

**History**

Nuclear terrorism is defined as, “the use or threat to use nuclear material, nuclear fuel, or radioactive products for acts of terrorism”\(^{86}\). The technology detailing how to construct a nuclear weapon is out there, and non-state actors have access, thus the greatest barriers for non-state actors are the actual facilities and the materials necessary. To manufacture a nuclear weapon, a non-state actor would need only about 25 kg of heavily enriched Uranium (HEU) or 5 kg of Plutonium.\(^{87}\) Groups could potentially purchase enriched uranium from already established nuclear states. The implications of a terror organization acquiring a nuclear weapon could be global catastrophe. There would be no need for a missile delivery system for the weapon, it could


\(^{86}\) Ibid

be driven into a city and detonated causing a humanitarian catastrophe of unparalleled scale.

There is also a threat from non state actors like terror groups making “dirty bombs” that utilizes a conventional explosive paired with radioactive material. Dirty bombs are do not present the same level of danger as a nuclear weapon, since the radius of radiation is much smaller, but they do still pose threats as an element of terror.\textsuperscript{10} Non state actors have attempted to steal weapons grade Uranium from research facilities in the past. In November of 2007 two groups of gunmen entered a South African research facility.\textsuperscript{12} The vault in this facility contained enough weapons grade Uranium for several nuclear weapons.\textsuperscript{12} Another case that occurred in Moldova in 2011 involving the potential sale of nine Kg of enriched Uranium, which is approximately one third of the nuclear material required for a weapon.\textsuperscript{12} It is because of the threats of terror groups acquiring nuclear weapons and because of the geopolitical implications of states acquiring nuclear weapons that there are treaties in place to prevent proliferation of nuclear weapons.

In 2014, in Mosul, Iraq, ISIS had access to two caches of Cobalt 60 which was locked in a storage room at Mosul University\textsuperscript{88}. Cobalt 60 is one of the core ingredients in a nuclear bomb and has lethal levels of radiation\textsuperscript{89}. The only reason ISIS was not able to access Cobalt 60’s deadly potential is because they could not figure out how to utilize it without exposing themselves to deadly radiation\textsuperscript{90}. Then in 2016, authorities discovered two ISIS brothers had been secretly watching a Belgian nuclear scientist who worked at the Tihange Nuclear Power Station with the aim of using material from this facility\textsuperscript{91}. With terrorist groups actively working to secure these materials, it is vital that there is global cooperation on this topic.

\textsuperscript{89} Ibid.
\textsuperscript{90} Ibid.
\textsuperscript{91} Ibid.
Confronting the black market network is a huge undertaking that cannot be done by one country alone. Iran, North Korea and Pakistan all currently have a nuclear weapons program in part because of this network, and A.Q. Khan\(^92\). Thus, this network is not only a risk for nuclear terrorism but for other states looking to proliferate. In the 1970s, A.Q. Khan sold designs to Pakistan which allowed them to further their nuclear weapons program\(^93\). In 2004, American agents stopped a German ship \textit{BBC China} “carrying parts for a Libyan nuclear-weapons-production program, and Libya, in subsequently renouncing its nuclear ambitions, had named Pakistan, and particularly the Khan Research Laboratories, as the supplier of what was to be a complete store-bought nuclear-weapons program\(^94\)”. It was also revealed that the Pakistani-run network had provided nuclear information and material to Iran and North Korea, and was in talks with either Syria or Saudi Arabia. Government officials in Pakistan denied any involvement and Khan was accused of running a rogue operation\(^95\). This could occur again and this threat must be dealt with.

In 2006 during the G8 Summit, the US and Russia announced the Global Initiative to Combat Nuclear Terrorism which works to “prevent the acquisition, transport, or use by terrorists of nuclear materials and radioactive substances or improvised explosive devises using such materials, as well as hostile actions against nuclear facilities\(^96\)”. There are currently 89 countries that are voluntary members. One of the working groups under this organization, the Nuclear Forensics Working Group (NFWG) aims to work with the IAEA to “assess and establish

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\(^{93}\) Ibid.

\(^{94}\) Ibid.

\(^{95}\) Ibid.


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linkages between nuclear and radioactive material”\textsuperscript{97}. Specifically the NWFG looks to “support efforts to stop and prosecute those who have attempted to transport, possess, or use it without legitimate state control”\textsuperscript{98}. Efforts outside of the IAEA are important to keep in mind as collaboration is necessary to confront the challenges of nuclear terrorism.

**Strengthening Safeguards**

One of the most important functions of the IAEA is “detering the spread of nuclear weapons through early detection of the misuse of nuclear material or technology”\textsuperscript{99}. The IAEA is able to perform this function through safeguards and verification. It is vital that safeguards and verification procedures are followed, which this committee is tasked with.

**Modernizing Safeguards**

In the early years of the NPT the IAEA operated based on countries explaining where their nuclear materials were and how much of the nuclear material they possessed. After the 1990s Gulf War, it was discovered that Iraq had been operating a nuclear weapons program despite signing the NPT. Following this discovery the IAEA has expanded its power to be better able to find undisclosed nuclear materials\textsuperscript{100}. The safeguards of the IAEA revolve around how large nuclear fuel stocks are and how they are being used\textsuperscript{101}.

All states that sign the NPT must create a safeguard agreement with the IAEA\textsuperscript{102}. The main goal of these safeguards is to ensure that nuclear materials are used only for peaceful

\textsuperscript{98} Ibid.
\textsuperscript{101} Ibid.
\textsuperscript{102} IAEA. Last modified , 2015. https://www.iaea.org/topics/safeguards-explained.
purposes. The IAEA’s safeguard process encompasses four main processes\textsuperscript{103}. The IAEA first analyzes a state’s nuclear program and compares it to the statements that that country made about its nuclear program\textsuperscript{104}. Each state will have a nuclear safeguard plan developed in cooperation with the IAEA to ensure they follow the guidelines of the NPT and IAEA\textsuperscript{105}. The IAEA will evaluate how the state does at reaching certain goals set for the nuclear program and it will point out any inconsistencies between the state’s declarations and the IAEA’s findings\textsuperscript{106}. Finally the IAEA will issue a report verifying that the states are following the safeguards\textsuperscript{107}.

One problem with the effectiveness of the IAEA’s safeguards is that they can only be enforced on countries that have agreed to follow them. If a nation does not ratify the NPT they are not held to the nuclear safety standards of the treaty. Today a notable non-member of the NPT is the Democratic People’s Republic of Korea (DPRK). The DPRK signed the NPT in 1985 but they backed out of the NPT in 2003 following the detonation of the DPRK’s first nuclear weapon\textsuperscript{108}. The DPRK can be seen as a case where the IAEA safeguards failed to prevent proliferation since despite being monitored by the IAEA and being suspected of violating the NPT the DPRK developed nuclear weapons technology\textsuperscript{109}. Obviously the IAEA cannot inspect non-state actors’ facilities, but one purpose of safeguards is also to ensure that states’ facilities cannot be penetrated by non-state actors, thus the material within the facilities cannot be stolen.

\textit{Verification and Monitoring}

\textsuperscript{103} Ibid.
\textsuperscript{104} Ibid.
\textsuperscript{105} Ibid.
\textsuperscript{106} Ibid.
\textsuperscript{107} Ibid.
\textsuperscript{109} Ibid.
The impetus behind the creation of the IAEA was to create an agency whose sole goal was to verify that states were honoring international agreements regarding nuclear weapons was maintained. Secondarily, the goal of the IAEA is to deter the spread of nuclear weapons through early detection in every NPT signatory state. The safeguards set in place by the IAEA come in four processes: Collection and Evaluation; Development of safeguard specific to each state; planning and conducting safeguard activities; and lastly, drawing conclusions on activities. Since 2010, 15 new safeguards agreements and 30 new additional protocols have entered into force. The amount of nuclear material under safeguards has increased by 24 percent and the number of nuclear facilities under safeguards has risen by 12 percent. According to the IAEA, there are currently 182 states with safeguards in place and 174 of them have comprehensive plans in place to allow the IAEA almost unfettered access to their nuclear stores. The IAEA also has access to 1,563 security cameras world wide, and 936 commercial satellites to aid it in its mission to maintain the peaceful use of nuclear energy. While safeguards traditionally have been more focused on member states’ activities, facilities and materials, this committee should think of safeguards, verification and monitoring in more creative ways to combat the threat of nuclear terrorism.

Resolution and Questions to Consider

A resolution for this topic should address nuclear terrorism concerns, but keep in mind that many experts do not believe that nuclear terrorism is a present credible threat. Think about a resolution as a way to protect against future threats as non-state actors get closer and closer to

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111 Ibid.
112 Ibid.
113 Ibid.
114 Ibid.
acquiring material and information. Remember that cooperation is key on this issue, and that the IAEA can collaborate with other organizations. Keep the following questions in mind while doing research:

4. How could the IAEA modernize safeguards to protect against threats of nuclear terrorism?

5. How can black market networks be targeted? How can material be protected?

6. How can your government explain the threat of nuclear terrorism to its citizens without causing panic? What policies does your government already have regarding conventional terrorism?
Works Cited


