**Kennesaw State University High School Model United Nations**

**International Atomic Energy Agency**

**February 28th – March 1st, 2025 Kennesaw, GA**

**Email: iaea.ksuhsmun2025@gmail.com**

*Delegates,*

 It is my pleasure to welcome you all to the 2025 Kennesaw State University High School Model United Nations Conference. My name is Kaan Cubukcu and I am the Director for the International Atomic Energy Agency. I received my Bachelors in Political Science from KSU, and this is my seventh year on staff in HSMUN. For those of you that have attended the previous years you may recognize me from past committees where I was your Director before. If you have not had the opportunity to attend my committees then I hope you find it challenging, engaging, and memorable. My family and I emigrated from Turkey to the U.S. in 2006; after attending an exchange trip to Germany in high school, participating in my high school's Mock Trial team, and being a Mayor Pro-Tem for the Sugar Hill Youth Council, I became convinced of my desire to work in politics and international affairs. I have a long track record in KSU’s Model UN programs as well as several internships with groups and firms like the Turkish Coalition of America and LB Int. Solutions. I look forward to meeting you all in committee and hearing your arguments for potential solutions. It is my pleasure to host the International Atomic Energy Agency.

With me is my Assistant Director, Julian Jahde. Julian is a sophomore getting his degree in Civil Engineering, and this is his second year competing on KSU’s Model UN team as well as diasing for KSU HSMUN. Outside of Model UN, Julian is a Senator for the Southern Polytechnic College of Engineering in the Student Government Association as well as a Tennis Coach. A fun fact about Julian is that he knows the flag for all 195 UN Member States and observer states. Our Committee Chair is Andrew Lynch. Andrew started his first year at KSU this current academic year majoring in International Affairs. This would make it the first time for KSU Model UN, but he has two years of High School Model UN experience. Andrew likes to bake and has an identical twin brother.

With personal introductions out of the way, I would like to present this years IAEA topics.

**The topics under discussion for the International Atomic Energy Agency are:**

1. **“Enhancing International Nuclear Safeguards: Strengthening IAEA Oversight and Cooperation to Prevent the Misuse of Nuclear Technology”**
2. **“Safeguarding Nuclear Facilities in Conflict Zones: Addressing the Risks of Military Occupation and Ensuring Global Nuclear Security”**

Each Member State’s delegation within this committee is expected to submit a position paper which covers **both of the agenda** topics. A position paper is a short essay describing your Member State’s history and position on the issues at hand. Each topic should take up one page, the whole document no longer than two pages. There are ***three*** key parts to any successful position paper: history, the current status of the issue, and possible solutions for the future. Information for properly formatting the position papers, as well as valuable advice for writing a quality paper, can be found in the [Delegate Preparation](https://conference.kennesaw.edu/hsmun/delegate-preparation.php) section of the HSMUN webpage. Delegates are reminded that papers should be no longer than two pages in length with each topic being a full page in lenth, and titles in size 12 and text in size 10-12 Times New Roman. Citations should be footnoted in Chicago style formatting, such as those used inside this guide. Furthermore, plagiarism in an academic setting is unacceptable and will nullify any score for the paper in question. During the grading process, we will be utilizing the university’s plagiarism checker. Wikipedia is a wonderful place to begin researching, but we highly encourage the use of peer-reviewed academic articles or trusted media sources. The objective of a position paper is to present the diplomatic position of your Member State on both agenda topics as accurately as possible. ***All position papers MUST be sent to iaea.ksuhsmun2025@gmail.com by February 21st, 2025. Late papers will be accepted until February 26th, 2025 with points penalized.***

**History of the International Atomic Energy Agency**

The International Atomic Energy Agency (IAEA) was established on July 29, 1957, and is headquartered in Vienna, Austria. The IAEA serves as the world’s central intergovernmental forum for scientific and technical cooperation in the nuclear field. Its mission is to promote the peaceful use of nuclear energy, prevent its use for military purposes, and ensure nuclear safety and security. The IAEA works closely with its 177 Member States to develop international standards and guidelines, provide assistance in nuclear technology, and verify compliance with international nuclear agreements. The governance of the IAEA consists of three main bodies: the General Conference, the Board of Governors, and the Secretariat. The General Conference, comprising all Member States, meets annually to decide on the agency’s policies and programs, approve the budget, and elect members to the Board of Governors. The Board of Governors, made up of 35 Member States, meets five times a year and plays a crucial role in decision-making and policy implementation. The Secretariat, led by the Director General, manages the agency’s day-to-day activities and operations.

The IAEA’s origins trace back to President Dwight D. Eisenhower’s "Atoms for Peace" speech in 1953, which highlighted the need for an international body to regulate and oversee nuclear technology's peaceful use. The agency’s initial focus was on providing technical assistance for the development of nuclear power and medicine, helping nations harness nuclear energy for peaceful purposes like energy production, agriculture, and healthcare. Over the decades, the IAEA has expanded its mandate to include ensuring the non-proliferation of nuclear weapons. It plays a key role in monitoring and verifying that nuclear material and technology are not diverted from peaceful use. The IAEA’s safeguards system involves inspections, monitoring, and verification activities conducted in Member States, ensuring that nuclear facilities comply with international agreements, such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

In addition to its safeguards role, the IAEA supports Member States in the development of nuclear safety standards and provides technical assistance in various fields, such as nuclear medicine, radiation protection, and nuclear waste management. It works collaboratively with governments and international organizations to establish and update safety guidelines that ensure the secure handling, transportation, and storage of nuclear materials. The agency also provides training and capacity-building programs for regulatory authorities and facility operators to enhance their ability to implement these standards effectively. The IAEA plays a critical role in emergency preparedness and response, helping countries manage nuclear accidents and crises. It operates the Incident and Emergency Centre (IEC), which serves as the global focal point for coordinating international responses to nuclear or radiological emergencies. For example, following the Chernobyl disaster in 1986 and the Fukushima incident in 2011, the IAEA was instrumental in coordinating international response efforts, providing expert assessments, and deploying specialized teams to assist in mitigating the impacts of the accidents. These events led to the development of more rigorous safety protocols and a strengthened international framework, including the adoption of the Convention on Nuclear Safety and the revision of the IAEA’s safety standards. Additionally, the IAEA continues to support affected regions through long-term environmental monitoring, health assessments, and decontamination efforts, ensuring that lessons learned from past incidents are integrated into future safety measures.

The IAEA’s work is structured around three fundamental pillars: **nuclear verification and security**, **safety standards**, and **sustainable development**. Each pillar represents a core aspect of the agency’s mission to promote the safe, secure, and peaceful use of nuclear technology.

1. **Nuclear Verification and Security**: The IAEA is the primary international body responsible for ensuring that nuclear materials and technology are not misused for weapons development. Through its verification system, the IAEA conducts inspections and monitoring activities under international agreements such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The agency’s safeguards system involves on-site inspections, satellite monitoring, remote surveillance, and analysis of nuclear material samples to verify that nuclear activities in Member States remain peaceful. Additionally, the IAEA offers support to countries in enhancing their nuclear security frameworks to prevent the illicit trafficking of nuclear materials and to counter the threat of nuclear terrorism. This includes providing guidance, technical assistance, and training to strengthen the physical protection of nuclear facilities, improve cyber security measures, and enhance border control capabilities.
2. **Safety Standards**: Ensuring the safety of nuclear facilities and the protection of people and the environment from harmful radiation exposure is a critical component of the IAEA’s mission. The agency develops and promotes international safety standards that govern the entire lifecycle of nuclear installations, from site selection and design to construction, operation, and decommissioning. These standards cover various aspects such as radiation protection, nuclear waste management, transport of radioactive materials, and emergency preparedness. The IAEA assists Member States in implementing these guidelines through expert missions, technical support, and training programs for regulatory authorities and operators. Furthermore, the agency conducts peer reviews and advisory services, like the Integrated Regulatory Review Service (IRRS), to evaluate and improve the safety measures in place within countries, ensuring they meet international best practices. By continually updating its safety standards based on new technologies, lessons learned from incidents like Chernobyl and Fukushima, and emerging risks such as climate change and cyber threats, the IAEA aims to minimize the potential hazards associated with nuclear energy.
3. **Sustainable Development**: The IAEA plays a significant role in promoting the use of nuclear technology for sustainable development, contributing to global efforts such as the United Nations Sustainable Development Goals (SDGs). Through its technical cooperation program, the agency helps Member States leverage nuclear science and technology for applications beyond energy production, such as in agriculture, water management, and health care. For instance, the IAEA supports countries in using radiation technology to improve crop yields, combat pests, and develop resilient plant varieties, all contributing to enhanced food security. In the field of health, the agency assists in establishing nuclear medicine facilities that offer diagnostics and treatment for cancer and other diseases, particularly in low and middle-income countries. Additionally, the IAEA works on environmental protection initiatives, including monitoring and assessing water resources using isotopic techniques to manage and sustain freshwater supplies. By integrating nuclear technology into various sectors, the IAEA aims to ensure that these peaceful applications contribute to the economic and social development of its Member States while adhering to the highest safety and security standards.

Together, these three pillars form the foundation of the IAEA’s mission to facilitate the peaceful use of nuclear technology while preventing its misuse and ensuring that global nuclear activities are conducted safely and securely. The balance of these pillars allows the IAEA to support sustainable development efforts, respond to emerging nuclear threats, and adapt its strategies to the evolving needs of the international community.

The IAEA’s recent activities also focus on addressing the proliferation of nuclear weapons by strengthening international cooperation and transparency measures. The agency conducts regular inspections and monitoring, providing crucial reports to its Member States and the United Nations Security Council when necessary. In recent years, the IAEA has played a pivotal role in monitoring compliance with the Iran Nuclear Deal (JCPOA) and ensuring North Korea’s nuclear activities remain under close scrutiny. As the leading authority in the nuclear field within the United Nations system, the IAEA continues to adapt to emerging challenges, such as nuclear terrorism, cyber threats, and the impact of climate change on nuclear facilities. Its programs and initiatives are designed to foster cooperation, enhance nuclear safety and security, and ensure that nuclear technology is used solely for peaceful purposes.

1. **Enhancing International Nuclear Safeguards: Strengthening IAEA Oversight and Cooperation to Prevent the Misuse of Nuclear Technology**

***Introduction***

 International Nuclear Safeguards are “activities by which the IAEA can verify that a State is living up to its international commitments not to use nuclear programmes for nuclear-weapon purposes.”[[1]](#footnote-0) Safeguards are the ways that the IAEA and other corresponding agencies verify there are not any criminal or terrorist acts that may harm the wellbeing of the world with rogue nuclear programmes. Oversight and cooperation between Member States are imperative to achieve a safe nuclear world, and the IAEA does this through identifying and promoting the best practices and creating programs that help states implement these programs.[[2]](#footnote-1) It is paramount that nuclear technology remains in safe development as it is involved in addressing many of the socio-economic development and environment goals in Member States.[[3]](#footnote-2) Nuclear technology is incredibly valuable in helping the world progress, and therefore global warming and addressing the greater need for power has created a larger burden on the IAEA to perform to protect against the misuse of nuclear technology.

 Currently, nuclear technology is not an inalienable right like nuclear energy is as defined by the Nuclear Non-Proliferation Treaty (NPT).[[4]](#footnote-3) The NPT also does not limit the development of nuclear technologies, therefore current measures have been limiting trade of needed material and technology to build advanced nuclear technology.[[5]](#footnote-4) However, there is a fear that current nuclear power programmes may in the future be used to develop unregulated nuclear technology that may be used in terrorist actions or uranium enrichment to develop nuclear bombs. The IAEA continues to work to bring the needed regulations and safety guidelines. It should be noted that regulations are usually made through mistakes, but nuclear related mistakes can mean death, war, or environmental degradation. So, the IAEA must think ahead and so must delegates.

***History***

The first prominent task for the Nuclear World was led by the US Secretary of State, James F. Byrnes, he called for the study and report of “the problem of peaceful development of nuclear energy and the elimination of nuclear weapons.”[[6]](#footnote-5) The task was started in the same month the UN Atomic Energy Commission (UNAEC) was formed. The UNAEC originated from the Conference of Foreign Ministers in Moscow December, 1945. The representatives included the major Allied Powers; the United States, Great Britain, and the Soviet Union. They created the UNAEC on January 24, 1946 to advise on the possibilities of “destruction of all existing atomic weapons and to work towards using atomic energy for peaceful purposes.”[[7]](#footnote-6) The findings of the study were to be presented to the UNAEC in the same year so the future of atomic weapons could be addressed.

What was originally planned to be presented from Byrnes’ Study would be named as the Acheson-Lilienthal report, it would officially become public in March 1946. This study was commissioned during a time when many Member States were in awe and in fear of nuclear weapons, and looking towards finding their own access to this new technology through negotiations or espionage. The report came at the right moment as it introduced a basic framework when it came to nuclear protection and security—with the report mostly written by the chief scientific consultant, Robert Oppenheimer (“the wartime director of the Los Alamos atomic bomb laboratory”).[[8]](#footnote-7) The report which got its name from the overseers of the study, ”Dean Acheson, the US Under-Secretary of State, and David Lilienthal, the Chairman of the Tennessee Valley Authority” noted that even with a NPT being followed by individual Member States it would not be a guarantee against misuse of nuclear technology.[[9]](#footnote-8) Therefore, the report outlined a framework describing that all operations surrounding Nuclear Safeguards should not be placed in the hands of individual Member States, but should be placed in the authority of a single international authority, the future IAEA.[[10]](#footnote-9) This is the framework which Robert Oppenheimer and other leaders of the report tried to emphasize. However, it is important to understand, in 1946 no one knew what the future held for atomic energy and technology and how individual Member States would play a role in that future when the report was made.[[11]](#footnote-10)

The report’s ideas called for a single international authority that could give the international community comprehensive oversight, better efficiency in crisis management, non-proliferation, standardization, and increasing global cooperation between atomic agencies. The day before the report would be submitted the US President Truman would appoint Bernard Baruch as the American delegate to the UNAEC.[[12]](#footnote-11) He would present a slightly different plan which was coined the Baruch Plan. In June 1946, the study was turned into the Baruch Plan which was offered to the UN Atomic Energy Commission (UNAEC) proposing the creation of an International Atomic Development Authority (IADA). IADA would have powers such as overseeing the use and research of atomic energy, managing nuclear installation, and nuclear inspections. However, there was one notable exception added by Bernard Baruch with an addition of the ability to impose sanctions and being non-subject to the veto of any power.[[13]](#footnote-12) The Soviet Union saw differently as there needed to be agreements between the Security Council to keep order in the world, meaning that the veto power must never be surrendered for any issue.[[14]](#footnote-13) The USSR would propose other options than what was laid out by the Baruch Plan, however, disagreements arose which led to 200 sessions and more than two years of debate before UNAEC finished with failure to create a centralized organization.[[15]](#footnote-14) It was a UN session that took heated deliberation and debate as it meant the future of who can obtain access to the somewhat limitless potential of nuclear technology.

However, before a Statute could be ratified the world was presented with a crisis. The crisis was soon after the conference when on 29 October 1956, Israel, the United Kingdom, and France invaded Egypt to gain control of the Suez Canal.[[16]](#footnote-15) The Suez Canal was a central transportation hub especially for an important energy resource, oil. These members would be pressured out of the Suez Canal by the United States and the USSR. However, after France's withdrawal the French Prime Minister, Guy Mollet, who was originally weary about a French nuclear program decided that it was now imperative. France also saw it necessary to provide Israel nuclear technology as they had decided that the Suez “debacle” provided the reason for both Israel and France to obtain and research Nuclear technology.[[17]](#footnote-16) The international conflict, which seemed totally separate from the nuclear debate, would lead to an expansion of nuclear technology. With no nuclear regulatory agencies to regulate the flow of nuclear material and technology, the situation led to a higher risk of misused nuclear technology in the long-run.

In the end it took until 1957 for the IAEA to be accepted and ratified by 26 Member States, and it would operate akin to a trading organization, buying and reselling nuclear related material and only operating with agreement of a Member State.[[18]](#footnote-17) The IAEA can be thought about as the referee of the global nuclear market helping Member States trade and share nuclear technology peacefully. The IAEA’s chief executive would be the General Manager responsible at the time for the “16-nation board of directing States.”[[19]](#footnote-18) The only legal obligations for members was to pay its dues so the IAEA could operate. No state would have to accept IAEA safeguards or standards—unless they received aid from the IAEA—and there was no requirement that the IAEA was to be used to move nuclear supplies. The current IAEA is still the same in these respects and the IAEA would be able to flourish because of the eagerness to join a seat on the Board. Also, Member States would also turn towards the IAEA for precious nuclear resources and technology like uranium.[[20]](#footnote-19) The IAEA would gain power through this monopolistic method and through support from major nuclear powers.

By the 1960s the IAEA was more dominant and secure in its position when it started to complete its first major task in preventing the misuse of nuclear technology through the Nuclear Non-Proliferation Treaty (NPT). As the treaty was being organized it was clearly evident that the IAEA would play a strengthening role in international security through working with nuclear-weapon Member States and non-nuclear-weapon Member States.[[21]](#footnote-20) The treaty gave emphasis on the “demands of the non-nuclear-weapon States” that they can continue research on non-nuclear-weapon research through supervision of the IAEA.[[22]](#footnote-21) The IAEA eagerly created a new safeguard system as assigned by the NPT, it would be responsible for verifying that nuclear weapon research was not happening in non-nuclear Member States who are a part of the NPT. In return, the IAEA tried to expand the safe use of nuclear technology by fostering cooperation between Member States to share research on nuclear technology. The IAEA, acting similarly to a middle-man allowed them to complete the requirements outlined in the NPT as more Member States signed onto the treaty.[[23]](#footnote-22)

The NPT had helped change the role the IAEA played on the world stage, but started to become outdated by 1981 where the primary focus of the IAEA was on meticulous accounting of nuclear material in plants in non-nuclear-weapon countries. This system started showing defects as there grew a large amount of “undeclared nuclear plants” and nuclear disasters started affecting developed nations.[[24]](#footnote-23) In 1981, Israel started an attack on a civilian nuclear plant that was under IAEA safeguards. The reactor was in Iraq where Israel believed that the Iraqi Government planned to use the plant to produce nuclear weapons.[[25]](#footnote-24) The IAEA would cut assistance from Israel, but it would only create more discussion and argument at the UN before Israel would regain assistance from the IAEA. It was a breakdown of cooperation between Member States and the situation only led to more gridlock and argument when the IAEA tried to bring about repercussions. Other dire situations include the Chernobyl disaster, Three Mile Island, and Fukushima nuclear accident. Chernobyl is linked with missteps in the engineering of nuclear reactor technology, Three Mile Island was correlated with a lack of oversight, and Fukushima having to deal with a natural disaster. Each instance showcases different missteps, but also opportunities to find ways to improve, so these incidents are never repeated.

***Current Situation***

“At this moment in human history, it is worth reminding ourselves what nuclear weapons are: the most destructive weapons the world has ever seen.” The Nobel Prize committee recently gifted the survivors of the atomic bombs in Japan for their actions in trying to remove the world of nuclear weapons.[[26]](#footnote-25) Nuclear technology is both a gift to this planet and also a responsibility for every generation to to continue to take actions to always make sure the truly terrifying effects of nuclear technology is not released on the world. However, currently there is complacency among many Member States in taking action to shore up safety measures and close cracks in nuclear guidelines which continues to be abused. For example, head of Nuclear Safety and Security for the IAEA, Tomihiro Taniguci noted, ‘“there is a very real possibility that we will become complacent with our high levels of [security] performance,’ with many operators wanting to extend the lifetime of plants beyond their original design.”[[27]](#footnote-26) There is a generally relaxed attitude with nuclear plants because of a lack of a serious nuclear disaster, however, if a disaster were to befall a Member State, it would risk the entire nuclear industry. This issue is not just localized to nuclear plants, gaps exist elsewhere too. The largest gap still exists in the establishment of “legal frameworks for trans-shipments, trading or brokering of items and re-exports or import of nuclear items.”[[28]](#footnote-27) The Nuclear Suppliers Group (NSG) which works in tandem with the IAEA is a 46-member group which requires IAEA safeguards as a condition of supply.[[29]](#footnote-28) The 46 members apply shared guidelines to control exports of nuclear materials, equipment, and technology and are an extra safeguard to protect the flow of nuclear materials where the IAEA may not have the power to act. The challenges that face the NSG and therefore the IAEA include new restraints on transfers of enrichment and reprocessing, and making implementation of new protocols a requirement for nuclear exports.[[30]](#footnote-29)

With recent increases in advanced technology and therefore nuclear technology, many more developed and developing Member States are using nuclear technology at an ever increasing rate. This increase in nuclear technology increases the need for organizations like the IAEA and NSG to expand its limited resources to help foster safe programs. One newer technology that has to be dealt with is fusion, which under the umbrella of IAEA guidelines, and offers an environmentally friendly source of energy. Fusion and fission are both atomic reactions but their fundamental processes offer different implications for safety.[[31]](#footnote-30) Current safety standards are being applied to fusion, however, those standards do not equate one to one accounting for the differences between fission (regular nuclear reactions) and fusion. The IAEA has tried to “foster this technology by holding Technical Meetings” so experts can share knowledge in improving fusion and ensure safety for fusion facilities.[[32]](#footnote-31) The IAEA would like for nuclear technology to be shared in a safe and structured way, but there is a rising concern of nuclear intellectual property theft. One such example of a breach of intelligence is through the military simulator video game War Thunder, employees who may have access to sensitive documents or patents may release the information especially if it is through a computer; “Behind a keyboard people are brazen and feel there are far fewer consequences.”[[33]](#footnote-32) The theft of intellectual property can cause a loss of competitive advantage, impact on research and development, and loss of reputation and financial losses.[[34]](#footnote-33) This can all affect the future of crucial nuclear technology research and can lead to technology development that is used for nuclear weapon programmes.

Certain Non Governmental Organizations (NGOs) and nuclear agencies are also looking at using nuclear power as a way to power advanced Artificial Intelligence (AI) and use it to advance and protect nuclear technology. Currently machine learning technology (AI) is used to screen for cracks in metal tanks and sift through data in shorter times.[[35]](#footnote-34) Nelly Nagoya Kubelwa, a nuclear engineer specializing in innovative technology at the IAEA noted that, “ For the deployment of this [AI] technology , we need to develop frameworks in collaboration with the regulators.”[[36]](#footnote-35) AI technology can be used to advance nuclear research and increase safety, but AI is still an emerging technology that needs better oversight.

The IAEA, in order to keep up with the greater need for nuclear power output, has taken actions such as increasing “the number of surveillance cameras installed at facilities.”[[37]](#footnote-36) These remote monitoring which also includes use of satellites have been very successful in reducing chances of dangerous weapons programs while keeping nuclear facilities running safely. However, in-person inspections are crucial as they give the best overview and compliance with nuclear guidelines. It is important that new technology works with IAEA inspectors to give the best outcome for nuclear compliance and safety.

The IAEA tries to institute safeguards for the safety of Member States but the safeguards are only fully effective if Member States actually follow through on their political commitments.[[38]](#footnote-37) The IAEA is also beholden to certain Member States when in negotiations on nuclear issues as the IAEA cannot enforce compliance or impose meaningful penalties on nations that violate non-proliferation agreements without affecting sovereignty of Member States. This is backed up by the fact that “out of the 189 States party to the NPT” there were additional protocols approved for 81 States, and out of those States only 37 implemented in full force.[[39]](#footnote-38) Continuing, nuclear technology like enrichment methods is advancing at an incredible rate which leads to bottlenecks verification methods and processes. For example, the internet and globalized economy has allowed the necessary factors for easy accessibility to means to conduct a covert nuclear weapons Programme.[[40]](#footnote-39)

***Actions by the UN***

The main legal instruments used by the IAEA are the Convention on the Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment, and the Code of Conduct for the Safety and Security of Radioactive Sources with its Supplementary Guidance.[[41]](#footnote-40) The CPPNM establishes protection for nuclear material in international transport and outlines criminal related offenses. The main idea is that it “envisages forms of international cooperation among the Parties.”[[42]](#footnote-41) The amendment to the CPPNM made it legally binding for Parties “to protect nuclear facilities and material in peaceful domestic use, storage and transport.” It would also expand measures for cooperation for locating stolen material, nuclear sabotage mitigation, and stop combat related offenses.[[43]](#footnote-42) It is highly important that the flow of nuclear material is controlled so that the IAEA and fellow Member States can safeguard against rogue actors. The sharing of information is critical in creating adequate cooperation and oversight between Member States and the IAEA.

Other instruments for nuclear security include the International Convention for the Suppression of Acts of Nuclear Terrorism which details offenses and cooperation for nuclear related terrorism. Other resolutions include Resolutions 1373 and 1540 which also strengthens cooperation to strengthen international security.[[44]](#footnote-43) Though the main goal of the IAEA is to provide safe nuclear energy to the world, the main mechanism is through the Integrated Work Plan (IWP).[[45]](#footnote-44) The plan is created by the IAEA and the new nuclear member state, it creates a framework for instituting IAEA guidelines and practices to support its nuclear power development. The IAEA bases development on a Milestones Approach which is a “result oriented programme” which helps to prepare for long term nuclear power programs.[[46]](#footnote-45)

***Conclusion***

IAEA has worked historically to find solutions to increase cooperation and oversight, but usually facing hurdles that lead to continued deliberation between Member States. The IAEA has tried to keep nuclear material under their purview and in limited quantities so that nuclear weapons could not be produced by a Member State. However, agreements between Member States have produced expansion of nuclear power, but it has also helped produce more nuclear weapons. The IAEA has continually had to update how it enforces policy to keep up with changing needs with nuclear related technology. Technology is always changing so the IAEA has recommended continuing updates to current nuclear resolutions so the IAEA and connected organizations are not left behind in the pursuit of protecting the world from nuclear disasters.

In the modern era complacency in international nuclear programs could risk the entire nuclear industry. Just one nuclear disaster could destroy everything built up by the IAEA since its inception. The IAEA must also balance its use of inspectors and technology so that its resources are used economically, but it is used in the best way to protect against the misuse of nuclear technology. New nuclear and non-nuclear technology is also a factor that the IAEA currently grapples with. AI technology can be useful in producing better protection and oversight for nuclear power plants. However, AI is still in its infancy stages so it will take time before AI is fully integrated with nuclear related technologies. The IAEA must also deal with questions regarding fusion which offers a cleaner source of energy, but is somewhat different in how it is approached in regards to oversight and regulations. The IAEA has many resources at its disposal but inaction can create dangerous situations as some Member States do not see the use of joining newer resolutions due to many reasons like economic or political differences.

***Committee Directive***

The IAEA has been a source of international knowledge and oversight for nuclear technology and power. However, the world is changing a lot faster and a lot more unpredictable than ever before. International conflicts could become rampant and in the mix nuclear oversight and cooperation could be lost if action is not taken in the present. Some Member States may believe that there are adequate guidelines and it may be true currently but it may not be true in the future. Technology offers an important access to many opportunities for Member States, but it also can create fear in how Member States may use the technology to expand its influence. There is a need for many state actors, Member States, or NGOs to access nuclear technology for a multitude of peaceful or harmful reasons.

Therefore delegates should consider the following questions:

-What actions can be taken to increase nuclear safety, oversight, and cooperation?

-What are the risks going into the future for the IAEA?

-How can the IAEA decrease complacency in nuclear programs?

-Where should the IAEA redirect their resources in the future?

-How can the IAEA identify possible misuses of technology without infringing on state sovereignty?

-Identifying who benefits from nuclear technology and why?

1. **Safeguarding Nuclear Facilities in Conflict Zones: Addressing the Risks of Military Occupation and Ensuring Global Nuclear Security**

***Introduction***

A nuclear facility, as defined by the United Nations (UN), includes any nuclear reactor, including reactors installed on vessels, vehicles, aircraft or space objects for use as an energy source as well as any plant or conveyance being used for the production, storage, processing or transport of radioactive material.[[47]](#footnote-46) Since the world’s first nuclear power station was connected to the municipal power grid in Moscow in 1954, nuclear power has been a budding development and pressing issue concerning the United Nations.[[48]](#footnote-47) With approximately 440 Nuclear facilities operating in over 32 Member States, and conflicts ensuing and arising across the globe, the nuclear facilities in conflict zones serve an imposing threat to the well-being of the surrounding populace and environment. Damage to these nuclear facilities can result in radiation exposure, and the long-term negative health effects of it, environmental contamination, as well as economic and social ramifications resulting from a loss of power.[[49]](#footnote-48)

 ***History***

Since the birth of the International Atomic Energy Agency (IAEA) in 1957, efforts to safeguard nuclear facilities have ensued. A few prominent incidents following the creation of the IAEA, made the necessity to protect nuclear facilities from conflict strikingly apparent. During the Cold War, various regions with nuclear capabilities became focal points of conflict, notably South Asia including India and Pakistan and in the Middle East, Israel and Iran.[[50]](#footnote-49) These hotspots of tension, coupled with events such as the Chernobyl Disaster in 1986, while not a conflict zone, highlighted the importance of nuclear safety and security. Events such as these demonstrated the destructive capability of mishandling nuclear facilities through widespread radiation sickness and contamination.[[51]](#footnote-50)

 Most notably, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), entered into force on 11 May 1995 lays the groundwork for all safeguards and policies regarding nuclear weapons and technology worldwide. Although expansive, the Treaty does not detail safeguards for facilities in the midst of conflict, few UN documents and/or resolutions do.[[52]](#footnote-51) Throughout the past fifty years, the most groundbreaking developments on protecting nuclear facilities in conflict comes from agreements between Member States. In 1988, India and Pakistan recognised the nuclear risk that might result from a war between them and agreed to exclude nuclear facilities, including all facilities that use or store large amounts of radioactive materials, from attack. Every year since 1992, they have exchanged lists of these facilities despite ongoing tension and even hostility.[[53]](#footnote-52) Another notable resolution comes from the International Committee of the Red Cross (ICRC). Article 17 of the ICRC’s “Draft Rules for the Limitation of the Dangers Incurred by the Civilian Population in Time of War” touched on the subject of installations containing dangerous forces, including nuclear electrical generating stations.[[54]](#footnote-53)

***Current Situation***

 In order to accurately assess the danger and risk involved with nuclear reactors in conflict zones, we must take a look at the inner workings of and differentiate between types of modern nuclear reactors. The primary components that differentiate types of nuclear reactors are the **fuel**, the **moderator**, the **control rods**, the **coolant**, and sometimes the **steam generator**. A nuclear reactor produces and controls energy by splitting the atoms of certain elements, a process called **fission**. This energy is used to generate heat, which is then used to create steam that drives turbines to produce electricity.[[55]](#footnote-54) The **fuel** used in most reactors is the same: small pellets of **Uranium Oxide (UO2)** packed into tubes called fuel rods. These rods vary in length depending on the reactor type. Longer rods generate more heat throughout the reactor core, while shorter rods can create uneven heating in specific areas. For a large reactor, like a 1000 megawatt (MWe) Pressurized Light Water Reactor (PWR), there might be around 51,000 fuel rods containing over 18 million fuel pellets. These fuel rods remain radioactive for millions of years.[[56]](#footnote-55)

The **moderator** is another essential part of the reactor. It slows down the neutrons released during fission, making it easier to sustain a controlled chain reaction. Common materials used as moderators include normal water (**light water**), heavy water (a form of water where hydrogen is replaced by **deuterium**, a heavier hydrogen isotope), or graphite. **Control rods** serve a similar purpose to the moderator, helping to control the fission reaction. Made of neutron-absorbing materials, they can be inserted or removed from the reactor core to speed up, slow down, or completely stop the reaction. The **coolant** is a fluid that flows through the reactor core to carry away the heat produced during fission. Coolants reduce the risk of overheating and vary by reactor type, with some reactors using a single cooling loop and others using multiple loops. Finally, some reactors include a **steam generator**, which is part of the cooling system. In these reactors, the heat from the coolant is used to produce steam that drives the turbines. A steam generator acts like a heat exchanger, transferring heat from the reactor core to the water that turns into steam.[[57]](#footnote-56) The technical components—fuel, moderator, control rods, coolant, and steam generator—not only differentiate reactor types but also determine their susceptibility to external threats, such as sabotage, military strikes, or prolonged logistical disruptions. By understanding these vulnerabilities, Delegates can better evaluate the challenges of safeguarding nuclear facilities during armed conflicts and develop targeted strategies for addressing them.

 The three types of reactors we will examine are Pressurized Light Water Reactors (PWRs), Boiling Water Reactors (BWR), and Light Water Graphite-moderated Reactors (LWGRs). The PWR is often considered the safest reactor design due to its reliance on a pressurized primary cooling circuit that prevents water from boiling. This mechanism acts as a natural safety feature, as steam formation slows the fission reaction, providing a built-in response to overheating. However, this safety depends on the uninterrupted operation of both primary and secondary cooling circuits, making PWRs highly vulnerable to damage to auxiliary systems, such as off-site power lines, coolant reservoirs, or steam generators. In conflict zones, the dual cooling circuit system could become a liability if one circuit is compromised. For instance, a missile strike that damages the steam generator would interrupt the heat transfer process, causing a potential reactor shutdown or, worse, core overheating.[[58]](#footnote-57) Delegates should consider how international actors might secure these external systems, particularly in regions like Ukraine, where military activity is frequent near critical infrastructure. Another major vulnerability lies in the reliance on off-site power to maintain the functionality of coolant pumps and safety systems. Prolonged power outages, such as those seen during the Zaporizhzhia crisis, can prevent the reactor from maintaining safe operating temperatures, increasing the likelihood of core damage or radioactive material release. These risks emphasize the need for secure energy grids, backup power systems, and emergency logistics.

The BWR is inherently similar to the PWR except that there is only a single cooling circuit in which the water is at a lower pressure (nearly half of the pressure in the PWR) which allows it to be brought to a boil at 285℃, this decreases the moderating effect thus increasing the efficiency of the reactor. While the single-circuit cooling system in BWRs simplifies design and operation, it introduces unique risks during conflict. Lower operational pressure compared to PWRs makes the reactor more efficient but less resistant to rapid pressure changes caused by physical damage. For instance, a direct strike on the reactor vessel could cause the boiling coolant to evaporate rapidly, creating steam voids that reduce cooling efficiency and increase the likelihood of overheating. The lack of redundancy in BWR cooling systems exacerbates these risks, as a single failure point could disable the reactor’s ability to manage heat.[[59]](#footnote-58) Additionally, the large volume of boiling water within the reactor core poses a risk of radioactive steam release in the event of structural breaches. Delegates might consider whether deploying BWRs in conflict-prone areas warrants stricter international oversight or additional safety retrofits, such as reinforced containment structures.

LWGRs, particularly the RBMK (Russian: реа́ктор большо́й мо́щности кана́льный, РБМК; *reaktor bolshoy moshchnosti kanalnyy*, "high-power channel-type reactor") design, present the highest vulnerabilities during conflict due to their inherently unstable design. The use of a fixed graphite moderator allows the reactor to continue fission even when the coolant is lost, increasing the risk of a runaway reaction. This design flaw, coupled with the inability to regulate neutron activity effectively during emergencies, makes these reactors particularly dangerous if subjected to power loss, cooling system damage, or sabotage. The size and layout of LWGRs also make them more difficult to protect. The long vertical fuel channels and sprawling cooling loops create multiple points of vulnerability, where damage to one section can cascade into a reactor-wide failure. For example, a targeted strike on the cooling water intake could not only disable the reactor’s cooling system but also expose the graphite core to oxidation, leading to potential fires or the release of radioactive particles.[[60]](#footnote-59) Given these weaknesses, LWGRs in conflict zones are a high-risk liability. Delegates could discuss whether older reactor designs, like the RBMK, should be phased out entirely or whether international coalitions should offer technical and financial support to upgrade them. Additionally, discussions might focus on the ethical implications of maintaining reactors with known safety deficiencies in politically unstable regions.

 Not only are attacks on nuclear facilities dangerous, but occupation of these important facilities can deprive surrounding cities and populations of essential needs during times of crisis. The most notable nuclear facility currently facing the consequences of conflict is the Zaporizhzhia Nuclear Power Station in southeastern Ukraine, Europe’s largest nuclear plant. The plant has six Pressurized Light Water Reactors[[61]](#footnote-60) each generating 950 MWe for a total output of 5,700 MWe. The plant has been under Russian control after facing capture from Russian forces on 4 March 2022, shortly after the start of the invasion of Ukraine. While in operation in 2020, the plant generated nearly half of the electricity derived from nuclear power, and more than a fifth of total electricity generated in Ukraine[[62]](#footnote-61), leaving many citizens without power for days and even weeks. During over two hours of heavy combat for control of the plant, large caliber bullets pierced an outer wall of reactor four and an artillery shell hit a transformer at reactor six, causing a potential catastrophe leading President of Ukraine Zelenskyy to accuse Putin of “nuclear terrorism”[[63]](#footnote-62). Other safety concerns come from Russian drone strikes around 17 August 2022, the impact site of which was close to the essential cooling water sprinkler ponds and about 100 meters from the Dniprovska power line, the only remaining 750 kilovolt (kV) line that provides essential power supply to the plant[[64]](#footnote-63). This action conflicts with the IAEA Director General’s announcement in 2022 of seven indispensable pillars for ensuring nuclear safety and security during an armed conflict, particularly pillar four, which states that there must be a secure off-site power supply from the grid for all nuclear sites, seeing as how lack of power to the facility increases the risk of a potential disaster affecting the surrounding area and possibly a large portion of Europe. The seven indispensable pillars, serving as the only regulations on nuclear safety during armed conflict, although informal, are derived from nuclear safety standards and nuclear security guidance. They are as follows:

1. The physical integrity of facilities – whether it is the reactors, fuel ponds or radioactive waste stores – must be maintained.
2. All safety and security systems and equipment must be fully functional at all times.
3. The operating staff must be able to fulfill their safety and security duties and have the capacity to make decisions free of undue pressure.
4. There must be a secure off-site power supply from the grid for all nuclear sites.
5. There must be uninterrupted logistical supply chains and transportation to and from the sites.
6. There must be effective on-site and off-site radiation monitoring systems, and emergency preparedness and response measures.
7. There must be reliable communication with the regulator and others

These pillars[[65]](#footnote-64), announced after the Russian seizure of Zaporizhzhia, are the only guidelines released by the UN on nuclear facilities in time of armed conflict. Currently, Workers employed by Ukraine’s national operator Energoatom are no longer permitted to access the site, replaced by a Russian operating entity.[[66]](#footnote-65) The loss of Zaporizhzhia has been devastating and anxiety-filled for Ukranians as well as all of Europe. The loss of an essential resource (power) coupled with the threat of a nuclear fallout from Russian mishandling of the facility extensively demonstrates the importance of regulation on the treatment of nuclear facilities during times of armed conflict.

***Actions taken by the UN***

The issue of nuclear facilities in conflict zones gained significant attention following the Israeli airstrike on Iraq's Osirak nuclear reactor on June 7, 1981. This action, known as Operation Opera, marked a pre-emptive strike against a nuclear facility suspected of being part of a weapons development program. In response, the UN Security Council unanimously adopted Resolution 487. The resolution condemned the attack as a violation of international law and reaffirmed the inalienable rights of states to develop nuclear energy for peaceful purposes under the safeguards of the International Atomic Energy Agency (IAEA). Resolution 487 further called upon Israel to urgently place all its nuclear facilities under IAEA supervision. This marked an early instance of the UN addressing the intersection of armed conflict and nuclear infrastructure, emphasizing the need to protect such facilities from military action and ensure compliance with international norms.[[67]](#footnote-66)

### In the wake of the Russian invasion of Ukraine in February 2022, the safety and security of nuclear facilities became a pressing international issue, particularly concerning the Zaporizhzhia Nuclear Power Plant, the largest in Europe. IAEA Director General Rafael Mariano Grossi outlined seven indispensable pillars to guide the international community in safeguarding nuclear installations during armed conflicts. These principles included maintaining the physical integrity of nuclear facilities, ensuring the operability of safety and security systems, and securing off-site power supplies to prevent overheating or meltdown scenarios. Although these pillars are not legally binding, they have served as a critical framework for discussions on nuclear safety during conflict. They highlight the urgent need for international consensus on protecting nuclear facilities amidst war, underscoring the significant risks posed to regional and global stability.[[68]](#footnote-67)

The capture and continued occupation of the Zaporizhzhia Nuclear Power Plant by Russian forces since March 2022 has drawn widespread condemnation from the international community. Recognizing the heightened risk of a nuclear catastrophe, the UN General Assembly adopted a resolution in July 2024 demanding that the Russian Federation immediately restore full control of the plant to Ukrainian authorities. This resolution emphasized the critical role of secure management in mitigating potential disasters and ensuring the safety of surrounding populations. The resolution also reaffirmed the need for adherence to international law regarding the protection of civilian infrastructure during armed conflict. The situation at Zaporizhzhia has become a stark reminder of the vulnerability of nuclear facilities in conflict zones and the need for robust international mechanisms to safeguard them.[[69]](#footnote-68)

Nuclear facilities in politically sensitive regions are also subject to scrutiny regarding compliance with international safety and security standards. In November 2024, the IAEA Board of Governors adopted a resolution urging Iran to enhance its cooperation with the agency and provide detailed reports on its nuclear activities. This resolution followed growing concerns over the safety of Iran’s nuclear infrastructure amidst regional tensions. Although primarily focused on non-proliferation and transparency, these resolutions indirectly address the safety risks associated with the operation of nuclear facilities under the shadow of potential conflict. The resolution highlighted the role of the IAEA in maintaining global oversight and ensuring that nuclear infrastructure is not only safe but also used solely for peaceful purposes.[[70]](#footnote-69)

***Conclusion***

The subject of safeguarding nuclear facilities in ongoing conflict zones is uncharted territory, the rapid development of nuclear technology and facilities have brought to light on the world stage the dangers of the mismanagement of nuclear technology since the era of the Cold War. Ongoing international conflict, now more than ever, raises concern for the safety of these nuclear facilities, current United Nations regulations on the subject are inadequate and may even be described as makeshift, not accounting for a large variety of factors such as the associated risk that come from different types of nuclear reactors. Coupled with that, such regulations are not easily enforced and are easily disregarded and forgone in times of conflict.

***Committee Directive***

The safeguarding of nuclear facilities in conflict zones presents complex challenges that require sustainable international regulation, effective enforcement mechanisms, and enhanced cooperation among Member States. Ensuring the safety of these facilities during periods of armed conflict is not only a technical issue but a critical international policy concern that impacts regional and global security. As negotiations proceed, delegates should focus on addressing the following key policy considerations:

1. Strengthening International Frameworks:
How can existing international frameworks, such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and the Convention on the Physical Protection of Nuclear Material, be expanded to include specific provisions for safeguarding nuclear facilities in conflict zones? What role should the United Nations and the IAEA play in monitoring and enforcing compliance with these measures?
2. Global Cooperation and Compliance:
What mechanisms can ensure that Member States adhere to new or expanded regulations during periods of heightened geopolitical tension? How can the international community hold states accountable for actions that endanger nuclear safety, such as attacks on or the occupation of nuclear facilities?
3. Addressing Infrastructure Vulnerabilities:
How can international policy prioritize the protection of critical infrastructure, such as off-site power supplies, cooling systems, and logistical routes, essential for maintaining the safety of nuclear facilities? Should there be an international mandate for contingency planning and emergency response mechanisms in conflict-prone regions?
4. Modernizing Nuclear Safety Standards:
What global initiatives can promote the phased retirement of older, high-risk reactor designs, such as LWGRs, in favor of safer alternatives? How can the IAEA support Member States in upgrading existing facilities to meet modern safety and security standards, particularly in developing nations? How can off-site power supplies, cooling systems, and other external infrastructure essential to reactor safety be safeguarded in conflict zones?
5. Prevention and Mitigation in Conflict Zones:
How can international protocols prevent the weaponization of nuclear facilities or their use as bargaining tools during armed conflicts? What policies can ensure that civilian populations are protected from the risks of radiation exposure and environmental contamination resulting from damage to nuclear installations?

By focusing on these policy-oriented questions, delegates will work toward actionable solutions that strengthen international safeguards, improve the resilience of nuclear facilities, and prevent catastrophic consequences in conflict zones. Delegates are encouraged to draw upon existing frameworks, proposing updates or new treaties where necessary, and to use specific case studies, such as the situation at Zaporizhzhia, as a basis for broader policy recommendations. In doing so, the committee can address the urgent need for cohesive and enforceable international strategies to protect nuclear facilities in times of crisis.

1. “IAEA Safeguards Overview | IAEA.” n.d. International Atomic Energy Agency. Accessed November 12, 2024. https://www.iaea.org/publications/factsheets/iaea-safeguards-overview. [↑](#footnote-ref-0)
2. U.S. Department of State. n.d. *The International Atomic Energy Agency*. N.p.: Office of Multilateral Nuclear and Security Affairs. Accessed 11 12, 2024. https://www.state.gov/iaea/. [↑](#footnote-ref-1)
3. *Ibid.* [↑](#footnote-ref-2)
4. World Nuclear Association. 2021. *Safeguards to Prevent Nuclear Proliferation*. https://world-nuclear.org/information-library/safety-and-security/non-proliferation/safeguards-to-prevent-nuclear-proliferation#:~:text=The%20NPT's%20main%20objectives%20are,the%20Appendix%20to%20this%20page. [↑](#footnote-ref-3)
5. *Ibid.* [↑](#footnote-ref-4)
6. Goldschmidt, Bertrand. n.d. *The Origins of the International Atomic Energy Agency*. N.p.: IAEA. Accessed November 11, 2024. https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull19-4/19401281219.pdf%0A. [↑](#footnote-ref-5)
7. Office of the Historian. n.d. *The Acheson-Lilienthal & Baruch Plans, 1946*. Accessed 11 November, 2024. https://history.state.gov/milestones/1945-1952/baruch-plans. [↑](#footnote-ref-6)
8. Goldschmidt, Bertrand. n.d. *The Origins of the International Atomic Energy Agency*. N.p.: IAEA. Accessed November 11, 2024. https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull19-4/19401281219.pdf%0A. [↑](#footnote-ref-7)
9. Goldschmidt, Bertrand. n.d. *The Origins of the International Atomic Energy Agency*. N.p.: IAEA. Accessed November 11, 2024. https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull19-4/19401281219.pdf%0A. [↑](#footnote-ref-8)
10. *Ibid.* [↑](#footnote-ref-9)
11. *Ibid.* [↑](#footnote-ref-10)
12. Office of the Historian. n.d. *The Acheson-Lilienthal & Baruch Plans, 1946*. Accessed 11 November, 2024. https://history.state.gov/milestones/1945-1952/baruch-plans. [↑](#footnote-ref-11)
13. Fischer, David. n.d. *History of the IAEA The First Forty Years*. N.p.: IAEA. Accessed November 12, 2024. https://www-pub.iaea.org/MTCD/publications/PDF/Pub1032\_web.pdf. [↑](#footnote-ref-12)
14. *Ibid.* [↑](#footnote-ref-13)
15. *Ibid.* [↑](#footnote-ref-14)
16. *Ibid.* [↑](#footnote-ref-15)
17. *Ibid.* [↑](#footnote-ref-16)
18. *Ibid.* [↑](#footnote-ref-17)
19. *Ibid.* [↑](#footnote-ref-18)
20. *Ibid.* [↑](#footnote-ref-19)
21. Fischer, David. n.d. *History of the IAEA The First Forty Years*. N.p.: IAEA. Accessed November 12, 2024. https://www-pub.iaea.org/MTCD/publications/PDF/Pub1032\_web.pdf. [↑](#footnote-ref-20)
22. *Ibid.* [↑](#footnote-ref-21)
23. *Ibid.* [↑](#footnote-ref-22)
24. *Ibid.* [↑](#footnote-ref-23)
25. *Ibid.* [↑](#footnote-ref-24)
26. McCurry, Justin, and Han Kang. 2024. “Nobel peace prize awarded to Japanese atomic bomb survivors' group.” The Guardian. https://www.theguardian.com/world/2024/oct/11/nobel-peace-prize-awarded-to-japanese-atomic-bomb-survivors-group. [↑](#footnote-ref-25)
27. UN. 2005. “Complacency in nuclear industry must be avoided, warns UN official.” UN News. https://news.un.org/en/story/2005/12/162242. [↑](#footnote-ref-26)
28. Barot, Dhiren. n.d. “Untitled.” Scientific, technical publications in the nuclear field | IAEA. Accessed November 14, 2024. https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1316\_web.pdf. [↑](#footnote-ref-27)
29. “Nuclear Suppliers Group.” n.d. The Nuclear Threat Initiative. Accessed November 14, 2024. https://www.nti.org/education-center/treaties-and-regimes/nuclear-suppliers-group-nsg/. [↑](#footnote-ref-28)
30. “The Road Ahead for Export Controls: Challenges for the Nuclear Suppliers Group.” n.d. Arms Control Association. Accessed November 14, 2024. https://www.armscontrol.org/act/2011-01/road-ahead-export-controls-challenges-nuclear-suppliers-group. [↑](#footnote-ref-29)
31. “Safety in Fusion | IAEA.” n.d. International Atomic Energy Agency. Accessed November 14, 2024. https://www.iaea.org/bulletin/safety-in-fusion. [↑](#footnote-ref-30)
32. *Ibid.* [↑](#footnote-ref-31)
33. “Jack Teixeira: The video game players sharing secrets online.” 2023. BBC. https://www.bbc.com/news/technology-65354513. [↑](#footnote-ref-32)
34. Powerhouse Forensics. 2023. “Nuclear Engineer Intellectual Property Theft: A Rising Concern.” Nuclear Engineer Intellectual Property Theft: A Rising Concern. [↑](#footnote-ref-33)
35. “Enhancing Nuclear Power Production with Artificial Intelligence | IAEA.” 2023. International Atomic Energy Agency. https://www.iaea.org/bulletin/enhancing-nuclear-power-production-with-artificial-intelligence. [↑](#footnote-ref-34)
36. *Ibid.* [↑](#footnote-ref-35)
37. “Challenges in Nuclear Verification | IAEA.” 2019. International Atomic Energy Agency. https://www.iaea.org/newscenter/statements/challenges-in-nuclear-verification. [↑](#footnote-ref-36)
38. Goldschmidt, Pierre. 2003. “Major Challenges Currently Facing the International Nuclear Non-Proliferation Regime | IAEA.” International Atomic Energy Agency. https://www.iaea.org/newscenter/statements/major-challenges-currently-facing-international-nuclear-non-proliferation-regime. [↑](#footnote-ref-37)
39. *Ibid.* [↑](#footnote-ref-38)
40. Goldschmidt, Pierre. 2003. “Major Challenges Currently Facing the International Nuclear Non-Proliferation Regime | IAEA.” International Atomic Energy Agency. https://www.iaea.org/newscenter/statements/major-challenges-currently-facing-international-nuclear-non-proliferation-regime. [↑](#footnote-ref-39)
41. “Nuclear security conventions | IAEA.” n.d. International Atomic Energy Agency. Accessed November 14, 2024. https://www.iaea.org/topics/nuclear-security-conventions. [↑](#footnote-ref-40)
42. *Ibid.* [↑](#footnote-ref-41)
43. *Ibid.* [↑](#footnote-ref-42)
44. *Ibid.* [↑](#footnote-ref-43)
45. IAEA. 2020. “Integrated Work Plan.” https://www.iaea.org/sites/default/files/20/10/integrated-work-plan-an-isrs-strategic-planning-framework-to-support-member-states-in-introducing-nuclear-power.pdf. [↑](#footnote-ref-44)
46. *Ibid.*  [↑](#footnote-ref-45)
47. United Nations Office for Disarmament Affairs. "Convention on the Physical Protection of Nuclear Material." Accessed November 22, 2024.<https://www.un.org/disarmament/wmd/nuclear/cppnm/>. [↑](#footnote-ref-46)
48. World Nuclear Association. "Nuclear Power in Russia." Updated October 2024. Accessed November 22, 2024. https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-power.aspx. [↑](#footnote-ref-47)
49. "Nuclear Power Reactors in the World." Reference Data Series No. 2, 2023 Edition. Accessed November 22, 2024. https://www.iaea.org/publications/15079/nuclear-power-reactors-in-the-world. [↑](#footnote-ref-48)
50. International Atomic Energy Agency. "History." Accessed November 22, 2024. https://www.iaea.org/about/overview/history. [↑](#footnote-ref-49)
51. International Atomic Energy Agency. "Chernobyl Accident 1986." Accessed November 22, 2024. https://www.iaea.org/topics/chernobyl. [↑](#footnote-ref-50)
52. "Treaty on the Non-Proliferation of Nuclear Weapons (NPT)." Accessed November 22, 2024.<https://www.un.org/disarmament/wmd/nuclear/npt/>. [↑](#footnote-ref-51)
53. "India-Pakistan Non-Attack Agreement." Last updated June 2024. Accessed November 22, 2024.<https://www.nti.org/education-center/treaties-and-regimes/india-pakistan-non-attack-agreement/>. [↑](#footnote-ref-52)
54. "Draft Rules for the Limitation of the Dangers Incurred by the Civilian Population in Time of War." 1956. Accessed November 22, 2024. https://ihl-databases.icrc.org/ihl/INTRO/420. [↑](#footnote-ref-53)
55. International Atomic Energy Agency.“*Safety Classification of Structures, Systems, and Components in Nuclear Power Plants*.” Vienna: IAEA, 2021. Accessed November 22, 2024. https://www.iaea.org/publications/10555/safety-classification-of-structures-systems-and-components-in-nuclear-power-plants. [↑](#footnote-ref-54)
56. International Atomic Energy Agency."Nuclear Power Reactors in the World." Reference Data Series No. 2, 2023 Edition. Accessed November 22, 2024. https://www.iaea.org/publications/15079/nuclear-power-reactors-in-the-world. [↑](#footnote-ref-55)
57. Nuclear Energy Institute.“*Nuclear Energy Basics: How a Nuclear Reactor Works*.” Accessed November 22, 2024.<https://www.nei.org/>. [↑](#footnote-ref-56)
58. World Nuclear Association. “*Pressurized Water Reactors (PWRs)”*. Updated October 2024. Accessed November 22, 2024. https://www.world-nuclear.org/information-library/current-and-future-generation/pressurized-water-reactors.aspx. [↑](#footnote-ref-57)
59. World Nuclear Association. “*Boiling Water Reactors (BWRs)”*. Updated October 2024. Accessed November 22, 2024. https://www.world-nuclear.org/information-library/current-and-future-generation/boiling-water-reactors.aspx. [↑](#footnote-ref-58)
60. International Atomic Energy Agency. “*The RBMK Reactors: Design, Function, and Lessons Learned”*. Vienna: IAEA, 2015. Accessed November 22, 2024. https://www.iaea.org/topics/rbmk-reactor. [↑](#footnote-ref-59)
61. Santora, Marc, and Andrew E. Kramer. “In Ukraine, a Nuclear Plant Held Hostage.” *The New York Times*. August 23, 2022. https://www.nytimes.com/2022/08/23/world/europe/ukraine-zaporizhzhia-nuclear-power-plant.html. [↑](#footnote-ref-60)
62. Zaporozhye 3 enters next 10 years of operation. Accessed November 12, 2024. https://web.archive.org/web/20171109080727/http://www.world-nuclear-news.org/RS-Zaporozhe-3-enters-next-10-years-of-operation-07111701.html. [↑](#footnote-ref-61)
63. Campbell, Charlie. “Ukraine War Is Changing Europe’s Nuclear Energy Enthusiasm.” Time, April 21, 2022. https://time.com/6169164/ukraine-nuclear-energy-europe/. [↑](#footnote-ref-62)
64. “Ukraine: Deteriorating Safety at Zaporizhzhya Nuclear Power Plant Following Drone Blast Nearby | UN News.” United Nations. Accessed November 12, 2024. https://news.un.org/en/story/2024/08/1153306. [↑](#footnote-ref-63)
65. “IAEA Director General Statement to United Nations Security Council.” IAEA, May 30, 2023. https://www.iaea.org/newscenter/statements/iaea-director-general-statement-to-united-nations-security-council-30-may-2023. [↑](#footnote-ref-64)
66. “Nuclear Energy Agency (NEA) - Ukraine: Current Status of Nuclear Power Installations.” Nuclear Energy Agency . Accessed November 12, 2024. https://www.oecd-nea.org/jcms/pl\_66130/ukraine-current-status-of-nuclear-power-installations. [↑](#footnote-ref-65)
67. United Nations Security Council. "Resolution 487 (1981)." Adopted June 19, 1981. Accessed November 22, 2024.<https://digitallibrary.un.org/record/25121>. [↑](#footnote-ref-66)
68. International Atomic Energy Agency. *Nuclear Safety and Security in Ukraine.* September 2022. Accessed November 22, 2024. https://www.iaea.org/sites/default/files/22/09/ukraine-2ndsummaryreport\_sept2022.pdf. [↑](#footnote-ref-67)
69. United Nations General Assembly. "Resolution A/RES/78/126." Adopted July 2024. Accessed November 22, 2024.<https://press.un.org/en/2024/ga12614.doc.htm>. [↑](#footnote-ref-68)
70. International Atomic Energy Agency. "IAEA Board of Governors Resolution on Iran." November 21, 2024. Accessed November 22, 2024. https://www.reuters.com/world/middle-east/un-nuclear-watchdogs-35-nation-board-passes-resolution-against-iran-2024-11-21. [↑](#footnote-ref-69)