**Forum:** World Health Assembly

**Issue:** Measures to mitigate the negative effects of radioactive substances

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**Introduction**

Radioactive compounds stand out as a contradiction in the history of human creativity, representing the complex interplay between invention and danger. These mysterious components have opened hitherto unexplored medical territories, providing treatments and comfort to countless sufferers. They have advanced scientific research and deepened our understanding of the cosmos by shedding light on cosmic riddles. However, a serious threat resides beneath their appealing exterior. Their powerful energy, which is capable of revealing the essence of life, highlights the delicate harmony between human creativity and responsibility. This contrast highlights the need for careful stewardship of our most potent works of art.

The discovery of radioactive substances in the late 19th century had a remarkable impact on how our world is now. They have made notable contributions to scientific inquiry, industry, food preservation, medical diagnostics, and cancer therapy. They have given us the means to advance human culture to new heights through our endeavors into nuclear energy and space travel. These outstanding accomplishments, though, come with serious risks. Living things are at risk because of their inherent instability, which can cause radiation to be released. The potential to ionize atoms, harm cells, and alter genetic material highlights the need for extreme vigilance. (IAEA)

Humanity must accept both the danger and promise these elements present as it negotiates their complexity. Their legacy serves as a reminder of the complex interplay between intellectual progress, moral duty, and steadfast research.

The delicate balance between human creativity and risk is embodied by radioactive materials. Their enormous promise in many areas necessitates a sensible strategy based on open governance. Governments must put an emphasis on open procedures as we navigate the complex waters of scientific advancement under the subject of "Navigation with Integrity." Governments can reduce hazards and promote international cooperation by assuring transparent and accountable handling of radioactive materials. Delegates actively promote transparency at this Model United Nations summit. By adhering to this rule, we may guide mankind toward a future in which the advantages of radioactive materials are appropriately utilized, ensuring a legacy of integrity, collaboration, and moral discovery.

**Definition of Key Terms**

**Radioactive substances**

Radiation is produced by unstable nuclei in radioactive substances. Due to their ionizing qualities, they pose health and environmental dangers when used in science, industry, medicine, and energy. Safety demands proper handling and disposal. (IAEA)

**Radioactivity**

The spontaneous radiation emission from unstable atomic nuclei is known as radioactivity. This organic process is essential to how radioactive chemicals behave and allows for their use in a variety of industries and sectors, including science, industry, medicine, and energy. It also poses threats to human health and the environment, therefore it must be handled carefully and regulated. (IAEA)

**Nuclei**

Atoms have nuclei, which are their center, dense cores and contain protons and neutrons. Strong nuclear forces hold them together as they create the atom's nucleus. The chemical makeup of elements is determined by their nuclei, which are also essential in nuclear processes. Physics and chemistry are two disciplines whose structure must be understood. (Britannica)

**Protons and Neutrons**

Within the atom's nucleus are the subatomic particles protons and neutrons. While neutrons are neutral, protons have an electric charge that is positive. They add up to an element's atomic mass collectively. An element's identity, which designates it as a specific element on the periodic table, is determined by the number of protons in the atom. The stability of atomic nuclei and nuclear processes depend heavily on protons and neutrons. (Britannica)

**Atoms**

Atoms are the fundamental building blocks of matter. They have a nucleus made up of protons and neutrons, which is around by electrons arranged in energy levels or shells. They have different numbers of protons and serve as the building blocks for elements. All substances in the universe are composed of molecules, which are created when atoms unite. Chemistry and physics are shaped by our understanding of the behavior and interactions of atoms, which is crucial to comprehending the physical universe. (britannica)

**Background**

A major turning point in science and technology was the discovery of radioactive substances. Henri Becquerel made the initial discovery of radioactivity in 1896, and Marie and Pierre Curie's outstanding work furthered this phenomenon's investigation. The potential uses of radioactive compounds were not completely appreciated at the time, and the attention was mostly on the fascinating characteristics of these elements.

But as scientists learned more about the physics of radioactivity, it became clear that exposure to radioactive materials might have serious adverse consequences on living things. The early 20th century saw the discovery of the harmful effects of radiation exposure, especially in the wake of the 1945 bombings of Hiroshima and Nagasaki. These occurrences brought to light the short- and long-term health repercussions of radiation exposure, such as acute radiation sickness, an increased chance of developing cancer, and genetic abnormalities.

Furthermore, instances like the Fukushima Daiichi nuclear crisis in 2011 and the Chernobyl disaster in 1986 served as vivid warnings of the possible disasters that could result from the improper handling of radioactive materials. As a result of the radioactive poisoning, these catastrophes not only had catastrophic direct effects on human populations but also had long-lasting environmental implications.

The understanding of the long-term effects of low-level radiation exposure has been the focus of intensive research in recent decades, which has resulted in stricter safety standards and guidelines in the nuclear industry and medical procedures employing radioactive materials. Despite these safety measures, there are still concerns about the harmful effects of radioactive chemicals, needing constant research and attention to maintain the safety of both people and the environment.

***Hiroshima and Nagasaki***

Hiroshima and Nagasaki's atomic strikes in 1945 serve as sobering reminders of the deadly effects of nuclear weapons. The immediate destruction was beyond comprehension: entire neighborhoods were turned to rubble, and thousands of lives were instantly lost. However, there were sinister, long-lasting repercussions in addition to the immediate destruction. The severe health crisis that developed as a result was the main and most extensive adverse effect. The acute radiation sickness that affected survivors, known as Hibakusha, was characterized by nausea, hair loss, and bleeding, and frequently resulted in excruciating deaths. Radiation's sneaky nature, however, also showed up as more subtle, lifelong health issues. In the generations that followed, survivors were found to have increased incidences of cancer, particularly leukemia, as well as birth abnormalities and other genetic problems. These horrifying health consequences offered a somber picture of the long-term impacts of exposure to radioactive materials, emphasizing the importance of global efforts to stop the use and spread of nuclear weapons.

The health problems caused by the bombings of Hiroshima and Nagasaki affected not just specific people but also whole towns and generations. In addition to physical conditions, survivors experienced social humiliation and discrimination. Furthermore, the widespread worry about radiation-related ailments persisted, having an adverse effect on mental health and general wellbeing. The bombings sparked international efforts to better comprehend the long-term effects of radiation exposure, which resulted in improvements to nuclear safety measures and global agreements meant to forbid the use of nuclear weapons. The tragedies of Hiroshima and Nagasaki serve as a sobering reminder of how crucial it is to maintain peace, diplomacy, and responsible handling of radioactive materials to protect people from the grave health consequences of nuclear conflict. (History.com)

***Chernobyl Disaster***

One of the worst nuclear accidents in history, the Chernobyl tragedy of 1986 had far-reaching detrimental impacts, particularly on human health. Reactor 4 at the Ukrainian nuclear power plant Chernobyl exploded shortly afterward, spewing a tremendous amount of radioactive material into the environment. The courageous actions of the firefighters and plant employees, who endured lethal radiation doses while attempting to control the accident, demonstrated the immediate, fatal effects of exposure. The effect, however, went well beyond the original explosion.

The health crisis was the most serious and long-lasting adverse consequence of the Chernobyl tragedy. Many of those involved in containment operations suffered from acute radiation sickness, which resulted in multiple fatalities.

Due to the discharge of radioactive iodine, hundreds of local neighbors and plant workers also had different radiation-related ailments, including thyroid cancer. The impacts did not just affect the generation that was exposed; the children of those who were harmed continued to experience higher rates of thyroid cancer, birth abnormalities, and other health problems.

In addition, large portions of the Chernobyl region became inhabitable, forcing communities to relocate and upsetting lives, highlighting the catastrophe's grave social and economic repercussions. The Chernobyl disaster underlined the urgent need for strict safety regulations in nuclear facilities, for international cooperation in the management of nuclear disasters, and for ongoing research into the long-term health effects of radiation exposure. It also brought home the terrible human cost associated with the improper handling of radioactive materials. (Britannica)

***Fukushima-Daiichi Nuclear Disaster***

A large earthquake and tsunami in Japan in 2011 caused the Fukushima-Daiichi nuclear crisis, which had wide-ranging negative impacts with human health at the forefront of worries. The Fukushima-Daiichi Nuclear Power Plant's multiple reactor meltdowns, which resulted in the discharge of hazardous materials into the environment, had an immediate impact. Even though radiation exposure did not immediately result in deaths, the accident had a significant impact on the population's health and well-being.

The psychological toll on evacuees and residents of the impacted areas was one of the disaster's main adverse impacts at Fukushima-Daiichi. Stress, anxiety, and other mental health problems were caused by the sudden relocation of communities as well as the worry about radiation exposure. Workers exposed to radiation and other dangerous elements during the cleanup and containment operations also faced serious health hazards. The disaster's long-term health repercussions are still a worry, particularly the elevated cancer risk brought on by radiation exposure, which is consistent with Chernobyl survivors' experiences.

The Fukushima-Daiichi tragedy also had significant social and economic repercussions. Due to agricultural and fishery restrictions, entire towns were uprooted, and the local economy deteriorated, which exacerbated the detrimental effect on people's lives and means of subsistence. The tragedy increased public awareness of nuclear power plants' susceptibility to natural disasters and stressed the value of rigorous safety regulations, disaster planning, and international cooperation in the management of nuclear facilities. The nuclear disaster at Fukushima Daiichi is a sobering reminder of the long-term effects of nuclear accidents, not just in terms of immediate health issues but also in terms of the resilience and long-term well-being of impacted communities. (Yamaguch, Mari)

***Goiânia Incident***

The Goiânia incident in 1987 was a terrible occurrence that brought to light the serious drawbacks of radioactive materials, especially when they are handled and disposed of improperly. Two people in Goiânia, Brazil, stole a radiotherapy unit from an abandoned hospital that contained the extremely radioactive material cesium-137 (Backhouse). They cracked open the machine without realizing the risks, exposing both themselves and others to the radioactive material.

The Goiânia tragedy had disastrous immediate effects. Those that took part in the scavenge were affected by acute radiation illness, which manifested as burns, nausea, and organ failure. Several people, including children, died because of radiation exposure, underscoring how dangerous it is to handle radioactive materials carelessly. In addition, the incident contaminated a lot of places, forcing costly cleanup procedures and the demolition of buildings to reduce the risk of further exposure.

Beyond the short-term implications on health, the Goiânia tragedy had long-term effects on the people involved and the neighborhood. Long-term health issues for those exposed to the radiation included a higher risk of developing cancer and other chronic diseases. The incident also had psychological repercussions, leaving the survivors and their families feeling afraid, anxious, and stigmatized.

The tragedy at Goiânia is a potent reminder of the value of managing, storing, and disposing of radioactive materials properly. It brought attention to the necessity of strict laws, public awareness, and education to avert repeat disasters. The incident sparked international attempts to enhance regulations and safety procedures pertaining to radioactive materials, highlighting the need for caution and accountability when handling such hazardous chemicals to protect human lives and welfare. (Britannica)

***Kyshtym Disaster***

One of the most significant nuclear catastrophes in history, the Kyshtym Disaster in 1957 at the Mayak Production Association in the Soviet Union demonstrated the dreadful consequences of radioactive materials on both human health and the environment. A waste storage tank exploded during the incident, sending a significant amount of radioactive pollution into the neighborhood. The immediate repercussions were disastrous. Thousands of residents from adjacent areas had to be evacuated because of the explosion's widespread contamination. Acute radiation sickness was suffered by those who were exposed to the radioactive fallout, which led to illnesses and, in some cases, fatalities. Both short-term and long-term impacts were upsetting. (Lewis)

The East-Ural Radioactive Trace (EURT), a highly hazardous area that had been contaminated, rendered the soil unusable for farming and unfit for human habitation. The catastrophe caused extensive ecological harm, polluted rivers, and lakes, and had a terrible effect on the ecology. The Kyshtym Disaster also had a significant impact on the population's health. Residents were more likely to get cancer, birth abnormalities, and other serious illnesses if they were exposed to radiation. Due to Cold War-era restrictions, the incident was kept under wraps for many years, which made it difficult to fully determine the degree of the harm and give the impacted people the medical attention and support they needed.

The Kyshtym Disaster underlined the urgent need for openness, strict safety regulations, and international collaboration in the management of radioactive chemicals and served as a strong warning about the possible dangers of nuclear activity. It emphasized the significance of responsible procedures to safeguard both human populations and the environment from the harmful impacts of radioactive materials by highlighting the devastating and long-lasting repercussions of improper management of nuclear materials. (Lewis)

***Marshall Islands Nuclear Testing***

The disastrous effects of exposure to radioactive substances were demonstrated by the United States' nuclear tests in the Marshall Islands between 1946 and 1958, which had a significant and long-lasting negative impact on the local population and the ecosystem. Significant amounts of radioactive fallout were blasted into the atmosphere throughout the tests, particularly the disastrous Bravo test in 1954, contaminating the nearby Pacific Ocean and the islands (Rapaport).

The nuclear tests had devastating immediate effects. Several atolls' populations were forcibly transferred, upsetting their way of life, including Bikini and Enewetak. Those who stayed on the islands throughout the testing were additionally exposed to high radiation levels, which resulted in acute radiation sickness, burns, and other health problems. The local food and water supplies were also contaminated by the fallout, which caused long-term health issues for those who were exposed.

Generation after generation was affected negatively by the nuclear tests. The exposed population showed high incidences of cancer, especially thyroid cancer. The descendants of individuals who were exposed to the radiation continued to suffer because of the prevalence of birth abnormalities and other health problems. Equally damaging to the environment were the coral reefs, the marine ecosystem, and some of the islands' ability to support life owing to radioactive contamination.

The terrible effects of nuclear weapon testing on people and the environment were starkly demonstrated by the Marshall Islands nuclear tests. The Comprehensive Nuclear-Test-Ban Treaty (CTBT), which sought to end all nuclear explosions for both civilian and military reasons, was signed in 1996 because of these events, underscoring the significance of international efforts to end nuclear testing. The events in the Marshall Islands brought to light the urgent need for environmental remediation, support for affected communities, and nuclear disarmament, as well as the importance of international cooperation in addressing the dangers of radioactive substances and averting further tragedies.

Major Parties Involved

International Atomic Energy Association (IAEA)

Established in 1957, the IAEA is an autonomous international organization under the United Nations, created to promote the peaceful use of nuclear energy and prevent its use for military purposes. It conducts inspections and aids member states in improving nuclear safety practices. Notably, it recently approved Japan's decision to release treated radioactive water from the Fukushima-Daiichi disaster and has faced considerable backlash (Japan Times).

Relevant initiatives affiliated with the IAEA include the Peaceful Uses Initiative (PUI), Atoms4NetZero, and the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO).

***United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)***

Established in 1955, the UNSCEAR is a United Nations body, mandated to "assess and report levels and effects of exposure to ionizing radiation." It also reports to the General Assembly annually, advising on disciplinarily relevant resolutions, and has published extensive research on the radiological legacy of the Cold War, the Chornobyl disaster, and the Fukushima-Daiichi disaster.

The UNSCEAR is currently carrying out evaluations on second primary cancer after radiotherapy, public exposure to ionizing radiation, and diseases of the circulatory system from radiation exposure among others, having already completed evaluations on the Chornobyl and Fukushima-Daiichi disasters (UNSCEAR).

***World Health Organization (WHO)***

Established in 1948, the WHO is a specialized agency of the United Nations responsible for international public health, working to improve global access to quality essential services long-term and to assist nations in responding to medical emergencies such as the COVID-19 pandemic. It has released publications on policy advice for national radiological stockpiles, exposure to solar ultraviolet radiation, and standardizing EMF standards.

Relevant initiatives affiliated with the WHO include the International EMF project, BioDoseNet, the INTERSUN program, and REMPAN (WHO).

***Individual Nations with Advanced Nuclear Capabilities***

Individual nations like India, Israel, Pakistan, North Korea, and the permanent members of the Security Council possess advanced nuclear capabilities that may contribute both to the issue and to global disarmament. Countries like France, Slovakia, and Ukraine which have invested heavily in nuclear energy generation domestically also bear some responsibility in this regard. Nations that have experienced nuclear disasters like Ukraine and Japan may have valuable insight in response to another major nuclear incident or the development of a long-term strategy in addressing the issue.

**Timeline of Events**

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| *Date* | ***Description of Event*** |
| 1895 | |  | | --- | | X-rays are discovered by Wilhelm Conrad Röntgen, later earning him the inaugural Nobel Prize in Physics in 1905 (Novelize). | |
| 1896 | Spontaneous radiation is discovered by Henri Becquerel (The Nobel Prize). |
| 1942 | Enrico Fermi and his team at the University of Chicago successfully construct Chicago Pile-1 (CP-1), initiating the first artificial controlled nuclear chain reaction (Lerner). |
| 1945 | The US detonates atomic bombs over Hiroshima and Nagasaki during WWII, marking the first and only use of nuclear weapons in armed conflict (History.com Editors). |
| 1945 | Initial studies by both American and Japanese teams on health effects for atomic bomb survivors – known as *hibakusha* in Japanese - are conducted within 6 weeks of the incident (Normile). |
| 1946 | The United Nations Atomic Energy Commission (UNAEC) is founded by the very first resolution of the General Assembly "to deal with the problems raised by the discovery of atomic energy" (First Committee). |
| 1946 | Herman Joseph Muller is awarded the Nobel Prize in Physiology or Medicine for his research on the mutagenic effects of radiation in 1927 (The Nobel Prize). |
| 1951 | The Experimental Breeder Reactor I (EBR-I) in Idaho, the world's first breeder reactor, produces enough electricity to power four light bulbs (Michal). |
| 1955 | The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) is established by Resolution 913 (X) of the General Assembly in response to widespread concerns about the effects of radiation on human health and the environment (UNSCEAR). |
| 1957 | The International Atomic Energy Agency (IAEA) is established to “accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world” (IAEA). |
| 1957 | The Shippingport Atomic Power Station in Pennsylvania reaches criticality and synchronizes with the distribution grid of Duquesne Light Company, becoming the first atomic electric power plant devoted exclusively to peacetime uses (Pope). |
| 1963 | The Limited Test Ban Treaty (LTBT) is signed, prohibiting nuclear weapon tests in the atmosphere, outer space, and underwater (U.S. DoS). |
| 1968 | The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is signed, aiming to prevent the spread of nuclear weapons and promote disarmament. It recognizes the right to peaceful nuclear energy and includes provisions for nuclear safety (UNODA). |
| 1986 | The explosion at the Chornobyl Nuclear Power Plant in Ukraine (also known as the Chornobyl disaster) occurs. A catastrophic amount of radioactive materials is released, causing immediate deaths and long-term health issues including cancers and thyroid disorders (Pacini). |
| 2011 | Following geological disturbances, the Fukushima-Daiichi Nuclear Power Plant in Japan experienced meltdowns, resulting in the release of radioactive materials into the Pacific ocean. |
| 2017 | The Treaty on the Prohibition of Nuclear Weapons (TPNW) is adopted by the General Assembly, prohibiting the use, threat of use, development, testing, production, acquisition, possession, and stockpiling of nuclear weapons (UNODA). |
| 2023 | The IAEA approves Japan's decision to release treated radioactive water from the Fukushima-Daiichi nuclear power plant into the Pacific Ocean due to lack of storage space. The process is estimated to take 30 years or more, and the Japanese government has faced backlash from China, Taiwan, and South Korea, among others (Yamaguchi). |

**Previous Attempts to Resolve the Issue**

Although the issue of mitigating the negative effects of radioactive substances is one that has not been addressed extensively in the past, it increasingly becomes a concern for the future as nuclear capabilities advance. The implications of exposure to radioactive substances are severe but relatively infrequent - consequently, many past solutions have emerged reactively in response to specific events such as the Chornobyl disaster rather than in proactive strategies and tend to be indirectly related to the topic at hand.

Nuclear Safety

* **CENNA & CACNARE:** The Convention on Early Notification of a Nuclear Accident (CENNA) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (CACNARE) are IAEA treaties adopted in 1986 in direct response to the Chornobyl disaster in April (IAEA). Respectively, the treaties declare that states will provide notification of any nuclear accident within its jurisdiction that may affect other states and of any assistance they can provide in case of a foreign nuclear accident.
* **Convention on Nuclear Safety (CNS):** The CNS was adopted in 1986 and intended to ensure all countries that operate nuclear reactors are committed to standards of nuclear safety. Today, all countries with functioning nuclear plants other than Iran are party to it. There was a push to amend the CNS after 2011’s Fukushima-Daiichi disaster – the CNS technically covers all relevant factors, and Japan’s national report to the CNS in 2010 asserted that “Japan has ensured implementation of the CNS”; however, the CNS has no means to compel states to implement the standards they are legally bound to uphold (Hibbs).
* **The Convention on Radioactive Waste Management:** The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (JCSSFMSRWM)[[1]](#footnote-1) is a 1997 IAEA treaty that addresses radioactive waste management, the first of its kind. States that ratify the Convention agree to its guidelines on the storage of nuclear waste and adjacent issues.
* **IAEA Services:** Integrated Regulatory Review Service (IRRS), Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS), and Occupational Radiation Protection Appraisal Service (ORPAS) are initiatives and services under the IAEA umbrella. The number of requests for ORPAS missions remains high and there is growing interest in ARTEMIS missions among Agency member states, according to the IAEA’s annual Nuclear Safety Review in 2022 (IAEA).

Nuclear Disarmament

* **Treaty on the Non-Proliferation of Nuclear Weapons (NPT):** The landmark 1968 NPT is an international treaty, signed today by more states than any other similar treaty. It includes three pillars: (1) non-proliferation, (2) disarmament, and (3) peaceful use of nuclear energy, prohibiting non-nuclear states from developing nuclear weapons and committing nuclear weapon states (recognized by the NPT as China, France, the United Kingdom, the United States, and the Soviet Union (now assumed by the Russian Federation), which also happen to be the five permanent members of the United Nations Security Council) to never "receive", "manufacture", or "acquire" nuclear weapons or to "seek or receive any assistance in the manufacture of nuclear weapons" (Article II) (UNODA).
* **Treaty on the Prohibition of Nuclear Weapons (TPNW):** The 2017 TPNW is intended to strengthen the second disarmament pillar of the NPT, with drafters deliberately avoiding any conflict with the NPT. The NPT has been criticized by LEDCs and commentators as providing a monopoly on nuclear weapons to the five states that had proliferated because 1968 while the TPNW seeks to makes nuclear weapons illegal for all countries, and so the TPNW can be seen as putting Article VI of the NPT into practice. As of 2023, all 193 UN member states including the original nuclear weapon states are party to the treaty (Erästö).
* **New START:** The 2010 New Strategic Arms Reduction Treaty (New START) is a nuclear arms reduction agreement between the United States and the Russian Federation. It follows the START I treaty which expired in December 2009, and replaces the Treaty of Moscow (SORT), which was to expire in 2012. New START limits the number of deployed strategic warheads to 1550, nearly two-thirds lower than in the original START treaty (New START). On 21 February 2023, ahead of the first anniversary of the Russo-Ukrainian War, Russia suspended its participation in New START. However, it did not withdraw from the treaty, and clarified that it would continue to abide by the numerical limits in the treaty (Presse).

Miscellaneous Initiatives

* **Nuclear Liability Conventions:** The Vienna Convention on Civil Liability for Nuclear Damage and the Paris Convention on Third Party Liability in the Field of Nuclear Energy were signed in 1963 and 1960 respectively, aiming to establish international standards to provide financial protection against damage resulting from certain uses of nuclear energy (IAEA). The two conventions largely mirror each other in content; however, contracting parties to one are not necessarily parties to the other.
* **Zangger Committee (ZAC):** The Zangger Committee, also known as the Nuclear Exporters Committee, is a group of countries named for Professor Claude Zangger of Switzerland, who chaired a series of informal meetings in Vienna on the interpretation of the NPT between 1971 and 1974. It was formed following the coming into force of the Nuclear Non-Proliferation Treaty (NPT), to serve as the "faithful interpreter" of its Article III, paragraph 2, to harmonize the interpretation of nuclear export control policies for NPT Parties (ZAC). It has 39 members today, including all nuclear weapon states.

**Possible Solutions**

Scientific Advancement

Member states should invest in research relating to the health effects of non-lethal radiation, similar to studies conducted on hibakusha or those affected by the Chornobyl disaster, especially if that state has significant investment in nuclear energy and is statistically susceptible to a nuclear incident.

Countries must enact and enforce legislation that establishes robust radiation safety standards in accordance with and based on the IAEA Safety Standards and previous conventions on nuclear safety; these laws should be designed to protect both the general population and those working in nuclear-related fields. Stricter regulations on radiation exposure limits and the ALARA (As Low As Reasonably Achievable) principle should be promoted internationally to ensure that standards are universally upheld.

In parallel with research efforts, it is imperative for countries to enact and strengthen legislation related to radiation safety and exposure limits. Robust national legislation should be harmonized with international standards, such as the IAEA Safety Standards and previous conventions on nuclear safety. These standards provide guidance on permissible levels of radiation exposure and safety measures to protect both the general public and workers in nuclear-related industries. Governments should also enhance transparency by requiring regular reporting on radiation data and incidents, making information accessible to the public, and encouraging accountability in the handling of radioactive materials.

Nuclear Disarmament

Of course, circumventing the problem at the root is more effective than continually addressing the symptoms. While radiation exposure from medical imaging procedures like MRIs or the rare case of nuclear reactor meltdown, nuclear warfare is undeniably the most catastrophic scenario in terms of both immediate and long-term consequences.

All countries, especially nuclear states, should be encouraged sign and ratify existing nuclear arms control and disarmament treaties such as the NPT, the CTBT, and the TPNW. While some of these treaties are not legally binding, they can serve as sources of international pressure; notably India, Pakistan, Israel, and South Sudan have not signed the NPT, while the DPRK withdrew in 2003. Delegates could also advocate for the conversion of these treaties into legally binding agreements through the United Nations Security Council as well as a modernization of the terms, elevating the international commitment to disarmament. In the case of continued hostile noncompliance to these treaties by a state, we can look to nations’ reactions to the Russian Federation after advent of the Russo-Ukrainian war. If diplomatic engagement fails, states can consider targeted economic sanctions, trade embargoes, and international isolation through other channels.

To concretely reduce reliance on nuclear weapons, countries should also prioritize strengthening non-nuclear defense capabilities. This could include investments in advanced conventional military technologies, bolstering cybersecurity measures, and expanding diplomatic conflict resolution initiatives. Countries with significant nuclear capabilities should commit to a gradual reduction of their nuclear arsenals while increasing investments in non-nuclear security measures to make up for that loss.

# Bibliography

Backhouse, Fid. "Goiânia accident." 31 August 2023. *Britannica.* October 2023. <https://www.britannica.com/topic/Goiania-accident>.

Erästö, Tytti. "The NPT and the TPNW: Compatible or conflicting nuclear weapons treaties?" April 2019. *Stockholm International Peace Research Institute.* <https://www.sipri.org/commentary/blog/2019/npt-and-tpnw-compatible-or-conflicting-nuclear-weapons-treaties>.

First Committee. "VIII. Resolutions Adopted on the Reports of the First Committee." 24 January 1946. <https://documents-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/032/52/PDF/NR003252.pdf?OpenElement>.

Hibbs, Mark. "A Failed Effort to Toughen Nuclear Safety Standards ." February 2015. *Carnegie Endowment for International Peace.* October 2023. <https://carnegieendowment.org/2015/02/18/failed-effort-to-toughen-nuclear-safety-standards-pub-59114>.

History.com Editors. "Bombing of Hiroshima and Nagasaki." 23 April 2023. *History.com.* October 2023. <https://www.history.com/topics/world-war-ii/bombing-of-hiroshima-and-nagasaki>.

IAEA. "Convention on Early Notification of a Nuclear Accident." n.d. *International Atomic Energy Agency.* October 2023. <https://www.iaea.org/topics/nuclear-safety-conventions/convention-early-notification-nuclear-accident#:~:text=The%20Convention%20on%20Early%20Notification,may%20result%20in%20an%20international>.

IAEA. "Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention." n.d. *International Atomic Energy Agency.* October 2023. <https://www.iaea.org/topics/nuclear-liability-conventions/joint-protocol-relating-to-application-of-vienna-convention-and-paris-convention>.

IAEA. "Nuclear Safety Reviw 2022." 2022. October 2023. <https://www.iaea.org/sites/default/files/gc/gc66-inf3.pdf>.

IAEA. *History*. n.d. October 2023. <https://www.iaea.org/about/overview/history>.

Japan Times. "Critics remain over IAEA's Fukushima water release approval." 7 2023 July. *The Japan Times.* October 2023. <https://www.japantimes.co.jp/opinion/2023/07/07/editorials/fukushima-water-release/>.

Lerner, Louise. *The first nuclear reactor, explained*. 2020. October 2023. <https://news.uchicago.edu/explainer/first-nuclear-reactor-explained>.

Lewis, Robert. "Kyshtym disaster." 22 September 2023. *Britannica.* October 2023. <https://www.britannica.com/event/Kyshtym-disaster>.

Michal, Rick. "Fifty years ago in December: Atomic reactor EBR-I produced first electricity." November 2001. *Operations.* October 2023. <https://www2.ans.org/pubs/magazines/nn/docs/2001-11-2.pdf>.

New START. "New START Treaty Text." 2010. *U.S. Department of State Archive.* <https://2009-2017.state.gov/documents/organization/140035.pdf>.

Normile, Dennis. "Aftermath." 23 July 2020. *Science.org.* October 2023. <https://www.science.org/content/article/how-atomic-bomb-survivors-have-transformed-our-understanding-radiation-s-impacts#:~:text=The%20Japanese%20were%20primarily%20trying,die—during%20future%20nuclear%20wars.>.

Novelize, Robert. *Squire's Fundamentals of Radiology*. Harvard University Press, 1997.

Pacini, F. "Thyroid consequences of the Chernobyl nuclear accident." December 1999. *PubMed.* <https://pubmed.ncbi.nlm.nih.gov/10626541/>.

Pope, John T. "Shippingport Atomic Power Station: A National Historic Mechanical Engineering Landmark." 20 May 1980. October 2023. <https://web.archive.org/web/20150717051921/http://files.asme.org/ASMEORG/Communities/History/Landmarks/5643.pdf>.

Presse, Agence France. "Putin Says Moscow Suspending Participation In New START Nuclear Treaty." February 2023. *Barron's.* October 2023. <https://www.barrons.com/news/putin-says-moscow-suspending-participation-in-new-start-nuclear-treaty-d307fa0f>.

Rapaport, Hart. "The U.S. Must Take Responsibility for Nuclear Fallout in the Marshall Islands." 4 April 2022. *Scientific American.* October 2023. <https://www.scientificamerican.com/article/the-u-s-must-take-responsibility-for-nuclear-fallout-in-the-marshall-islands/>.

The Nobel Prize. "Henri Becquerel – Biographical." 1967. *NobelPrize.org.* 2 October 2023. <https://www.nobelprize.org/prizes/physics/1903/becquerel/biographical/>.

The Nobel Prize. "Hermann J. Muller - Biographical." 1964. *NobelPrize.org.* October 2023. <https://www.nobelprize.org/prizes/medicine/1946/muller/biographical/>.

Trefil, James , McGrayne, Sharon Bertsch and Bertsch, George F.. "atom". Encyclopedia Britannica, 2 Jul. 2023, <https://www.britannica.com/science/atom.> Accessed 12 October 2023.

U.S. DoS. "Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water." 5 August 1963. <https://2009-2017.state.gov/t/avc/trty/199116.htm>.

UNODA. "Treaty on the Non-Proliferation of Nuclear Weapons." 1968. *United Nations Office for Disarmament Affairs.* <https://disarmament.unoda.org/wmd/nuclear/npt/#:~:text=The%20NPT%20is%20a%20landmark,and%20general%20and%20complete%20disarmament.>.

UNODA. "Treaty on the Non-Proliferation of Nuclear Weapons." July 1968. *United Nations Office for Disarmament Affairs.* <https://treaties.unoda.org/t/npt>.

UNODA. "Treaty on the prohibition of nuclear weapons." July 2017. *United Nations Office for Disarmament Affairs.* October 2023. <https://disarmament.unoda.org/wmd/nuclear/tpnw/>.

UNSCEAR. "Current Programme of Work." 2023. *United Nations Scientific Committee on the Effects of Atomic Radiation.* October 2023. <https://www.unscear.org/unscear/en/areas-of-work/index.html>.

UNSCEAR. *Historical Milestones*. n.d. October 2023. <https://www.unscear.org/unscear/en/about-us/historical-milestones.html>.

WHO. "Radiation and health." n.d. *World Health Organization.* October 2023. <https://www.who.int/teams/environment-climate-change-and-health/radiation-and-health>.

Yamaguchi, Mari. "At Fukushima Daiichi, decommissioning the nuclear plant is far more challenging than water release." August 2023. *AP News.* October 2023. <https://apnews.com/article/fukushima-daiichi-decommission-nuclear-radiation-wastewater-release-4745dff09d17a7de47b3e3dc4653724a>.

ZAC. "Zangger Committee and the NPT." n.d. *Zangger Committee.* October 2023. <https://zanggercommittee.org/zangger-committee-and-the-npt.html>.

1. This acronym is also just absurdly impractical; the chair recommends delegates use something to the effect of “The Joint Convention” when speaking. [↑](#footnote-ref-1)