

Committee: Environmental Commission

Issue: Prohibition of the dumping of radioactive waste

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Position: Deputy President

PERSONAL INTRODUCTION

Dear delegates,

My name is Despoina Pelekanou, I'm a student of the Rizarios Parochial High School and I look forward to serving as your deputy president of the Environmental Commission and the expert chair on the topic of Prohibition of the dumping of radioactive waste. I hope this study guide provides you with a good starting point for your research and a clear picture of what we're expecting to see in the resolutions that will be debated. I strongly advise you to read this document thoroughly and use the charts provided for you to define the policy of your country, so you can prepare a well-rounded and effective resolution on the topic. That being said I wish you best of luck and trust that we will have constructive debates in the Committee.

Best regards,

Despoina Pelekanou.

TOPIC INTRODUCTION

In recent times, the world has been dealing with an enormous energy crisis. Reason being that the forms of energy it has been relying on since the industrial revolution have been mainly based on petrol and its by-products, whose deposits are limited and currently running low. In the search of a new, inexhaustible source of energy, scientists have come across the very controversial possibility of utilizing nuclear power as the primary source of energy. While there's been a vast improvement in the scientific equipment, allowing experts to discover new possibilities and ways the benefits of nuclear power could outweigh the drawbacks, it is by no means in a position to substitute petrol as of right now. One of the principal reasons we're not yet able to make the switch is the amount of hazardous substances that it leaves behind after the fuel is consumed. According to the World Nuclear Association 200,000 m³ of low and intermediate level waste and 10,000 m³ / 12,000 tones of high-level waste is produced each year worldwide.

Yet, the aim of the discussion at hand is not to abolish nuclear power, as it is no longer realistic because amongst other benefits it does not contribute to gas emissions and provides consistent energy like no other renewable source. The task at hand is to minimize the negative effects of radioactive wastes and to work out more responsible and effective ways to deal with it. At present, methods that are unsafe for humans and perilous to the environment have been used with no regard to the consequences, infamous example of the argument is that of states, burying the waste under the seabed and having toxic substances scattered causing irreversible damage to the eco-system. Developing countries should also be accounted for since they have been constructing nuclear generators and it is questionable whether or not they have the advanced technological knowledge, and resources necessary to handle the radioactive waste that is inevitably left behind.

The question to ban the disposition of radioactive wastes is not a new one, but it is quite controversial. Issues such as the financial cost of managing or containing the waste, ocean pollution, transnational relations and the terminal medical conditions radiation is known to cause to humans indirectly demand to be taken into consideration while tackling the root of the problem. To conclude, one must consider whether or not the country they're representing is in favor or against this prohibition and in both cases under which circumstances, as the issue calls for a more complex answer other than strongly opposing or proposing and there are many factors that play a reoccurring role in each country's policy.

DEFINITION OF KEY TERMS

Prohibition

The act of prohibiting by authority, especially by law, a specific action, activity or deed.

Dump(ing)

Dumping refers to the unethical practice of disposing a material, no longer fit for use, in an irresponsible and improper manner with no regard to the consequences. In the case of radioactive waste dumping is most often, but not exclusively, used in the context of disposing of it in the ocean or in landfills but it's not limited to that use. Most famous dumping sites include; the North-East Atlantic Ocean, the Arctic Ocean, the North-East Pacific Ocean, the North-West Atlantic Ocean and the North-West Pacific Ocean.

Radioactive Waste

The largest percentage of radioactive waste is made up from the used fuel that is left after it has spent about three years in the reactor generating heat for electricity. Nevertheless, medical, industrial and agricultural radioactive waste is not uncommon. The waste altogether, can be divided in a two major categories;

1. Low and Intermediate Level Waste

It is most usually discovered in medical equipment and clothing attire and its levels of radioactivity are barely over the safety limit. They are handled by licensed professionals who bury them close to the surface in designated areas, such as spent fuel pools and as of the present they have posed no direct danger to humans or to the environment in the last 50 years.

2. High Level Waste (HLW)

It is a derivative of the burning of uranium in high heat and it is charged with big amounts of radioactivity. It is required that the waste is cooled down from being in extremely high temperatures, but more often than not, even after the cooling process it poses dangers to the environment. In addition to that, it is important that no form of life comes into contact with the waste because it's undoubtedly proven to be deadly. This is how the question was raised, because without finding a safe way to dispose of the waste, at some point in time storing facilities will no longer suffice for containing used fuel and inevitably cause complications to future generations. Delegates should realize that HLW should be the main focus of their resolution as it is the most dangerous one if a reliable solution isn't found.

	Volume	Radioactive content
High-level waste	3,00%	95,00%
Intermediate-level waste	7,00%	4,00%
Low-level waste	90,00%	1%

Waste Disposal/ Waste Management

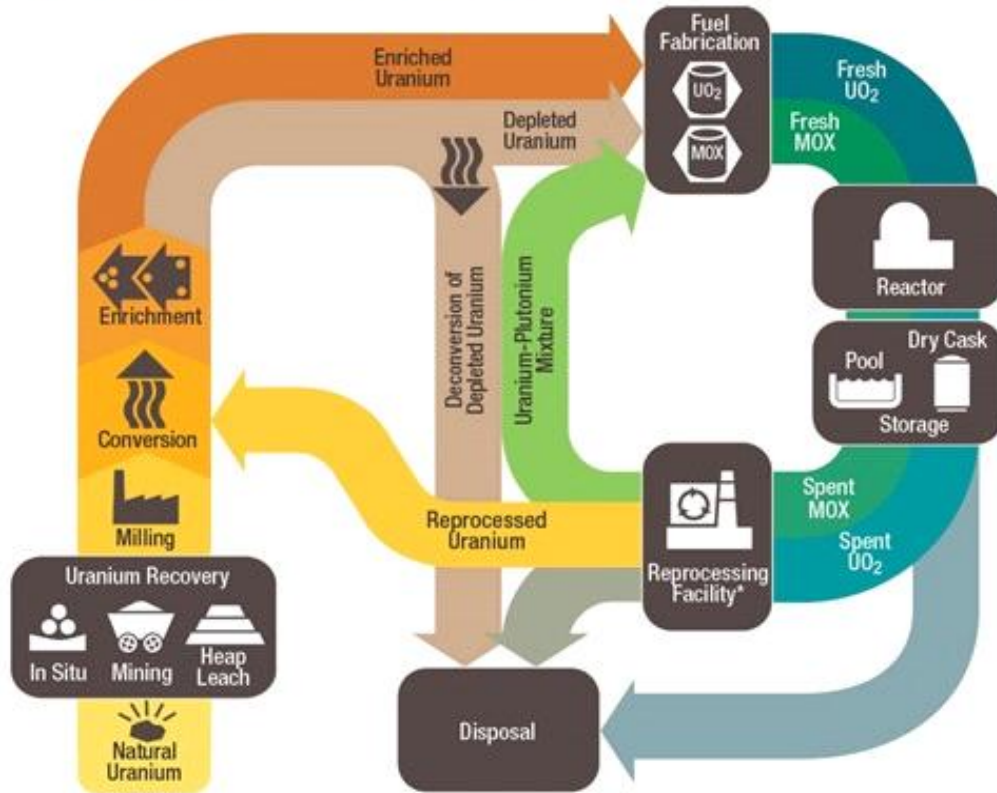
The former aims to do away with the waste with no intention for it to be utilized in the future, while the latter puts the waste through a lengthy procedure to refine and reduce the amount of radiation it emits before ultimately disposing of it.

BACKGROUND INFORMATION

How is radioactive waste produced?

Understanding how radioactive waste comes into existence and what is it that makes it so destructive to the environment is a vital part in tackling the issue effectively. In order to generate fuel for nuclear reactors companies need a raw material, in our case uranium is most commonly used. It's worth noting that the process of mining uranium creates pollution, it has been observed that miners are prone to respiratory implications and from a humanitarian point of view the process is detrimental to indigenous people, as their lands tend to be rich in the substance. 'Yellow powder' a uranium dense substance is universally used. Once mined the material has to go through a few more refinements so it can be used in the nuclear generators. At this stage the waste produced is very limited, but it's clear that uranium in itself is not harmless. Finally, the enriched uranium is transferred to the reactors where it is burned up to create nuclear energy. When the raw material can be no longer used, it is stored away so it can cool off from the scorching temperatures in the reactor.

The Nuclear Fuel Cycle



At this point, the ionizing radiation contained in used nuclear fuel should be further explored. Scientists have categorized it as Alpha, Beta and Gamma, going from the least penetrating one to the most dangerous. However, all of them have the ability to change atoms into ions, which can cause genetic modification, even cancer to living organisms, and are known to constantly emit radiation. This radiation is absorbed by every material and organism it comes into contact with. It should be evident now why the issue of dealing with it is more pressing than ever.

Storage

Radioactive wastes tend to be created in extraordinarily hot temperatures and are in immediate need to be cooled down in order for the managing process to go on. In a few cases, where the levels of radiation are low a storage period of up to two months is sufficient for the radio nuclides to die down so the material can be done away with as



#2: Spent Fuel Pools

regular waste. In cases where HLW is in question, waste is observed to have an extremely long half-life meaning that it continues to be radioactive for thousands of years, so the storing process is necessary in order to prevent the pollutants it contains from reaching the biosphere. Thus we understand that, the toxicity ratio contained in the waste determines the duration of the cooling process. In order to facilitate this procedure special containers, namely “spent fuel pools” are manufactured. They are built with multiple, dense concrete layers and they are often up to 12 meters in depth. When the fuel cools or the maximum capacity of the pool is reached certain precautions must be taken so that it can be safely transferred and contained before the disposal process can progress. A problem that can't be overlooked is the possibility of the cylinders being damaged -intentionally or not- and the waste coming into contact with the biosphere. If radioactive waste is handled properly from there, the drawbacks of nuclear energy and the safety hazards significantly reduce. Yet that does not seem to be the case, as storing is widely accepted as a temporary solution and it's still not clear what will the final destination be. As of the present there are two prominent ways to dispose of the wastes, *direct disposal* (surface level storing of waste until it decays) and *reprocessing*. It has been proven that reprocessing is far more harmful than direct disposal, because the amount of waste to be disposed ultimately escalates and it is possible to be utilized in the construction of nuclear weaponry. Yet countries such as China, Russia and India still utilize it.

Methods of Waste Management

The most common and widely used technique is that of landfills which, if all the safety guidelines are followed closely, it can be very effective in containing the harmful chemicals. Unfortunately, leaks have been observed over the years and the landfills were then permanently damaged.

Another practice is that of recycling where waste is collected and atoms are being extracted in order to be reused on certain applications. Unfortunately, this method is only capable of reducing the amount of waste and it's not very common as most reactors which produce a significant amount of waste run solely on uranium and the waste left behind is unsafe to be reused, as it remains radioactive and therefore extremely harmful for thousands of years. More research on the domain is definitely essential.

The most controversial and potentially hazardous method is that of incineration where the waste is disposed by being set on fire. As a direct result, substances, detrimental to the living organisms are released into the atmosphere. As of the present most countries have strict laws against this practice.

It is also worth considering that the time frame when dealing with radiation can be over centuries long, and long term solutions such as above ground disposal and geologic disposal are

currently being considered. In the first case the spent fuel is sealed in the fuel pool it'd been stored in along with inert gas. In this case, the waste is easily accessible, to be reprocessed more often than not. In the second scenario, experts are considering the construction of deep tunnel-like vaults, identical to construction of the Channel Tunnel, where high level waste will be sealed. Many consider it ideal for high level waste as humans will be unable to come in contact with it accidentally, but others remain skeptical as the location has not yet been decided and the venture entails more dangers as the capacity is limited and the isolation period necessary exceeds a million years in most cases.

Lastly, a problem that should be addressed is the illegal trade and transportation of waste. According to data from the Italian authorities a group of rebels bribed politicians so as to secure impunity, while large sums of money was being paid to them to dispose hundreds of barrels of waste, including radioactive medical waste, for prestigious international producers in Somalia. Even though, the specific group is no longer active, it is worth considering how many similar ventures are currently in action.

Environmental Impact

As we have established so far, there is no foolproof method to safely dispose of radioactive waste, while the hazardous consequences of discarding the problem have been outlined. Especially, in an era with a plethora of environmental issues, species extinction and deforestation, the world cannot afford any more damage. Accidents such as the Chernobyl catastrophe in 1986 and the one in Fukushima in 2011 should be taken into account as illuminating examples of what happens to areas exposed to radiation. In both cases the land and areas around it had to be evacuated because radiation had penetrated it, the soil was no longer fertile and people run the risk of cancer or deformative diseases. While the security standards have been improved since then, there's no guarantee what will happen if fuel pools are damaged and the spent fuel leaks.

MAJOR COUNTRIES AND ORGANISATIONS INVOLVED

China

Due to its rapid technological advancement and the rise in power demand China had to face an alarming air-pollution problem from coal emissions. That being said, the country had to shift to nuclear generators to satisfy the aforementioned rise in demand. As of 2004 China has been the lead producer of radioactive waste, a considerable portion of it hazardous to the environment and the population. The authorities have since made efforts to minimize the damage but as of now its policy has been mainly reprocessing and to maintain a closed nuclear

fuel cycle. On the other hand, the country has been promoting methods such as recycling and reducing the production of waste. Furthermore, China has been considering the practice of direct disposal as a long-term solution in the future.

United States of America

The biggest producer of nuclear power worldwide, with 104 running reactors is currently reconsidering its policy and its previous practice for the last decades that has been the direct disposal of the high level wastes. In order to manage and to ensure that wastes are disposed of safely, the Nuclear Regulatory Commission (NRC), whose main purpose is to establish effective measures and guidelines, monitors the companies in question so that the guidelines are not abused. Private high-level waste disposing and storing facilities are also monitored by the NRC.

Greenpeace

Since the Fukushima nuclear accident in March 2011 Greenpeace has taken a stance against nuclear power all together. The organization is actively recruiting likeminded individuals in order to defend their cause and their slogan "Say no to nuclear power, and yes to renewables!" is gaining momentum. More specifically on radioactive waste, Greenpeace has stated its concern and dissatisfaction on the already existing methods of management and deems them harmful to the environment and future generations.

World Nuclear Association

The World Nuclear Association aims at providing the public with a well-rounded and objective understanding of nuclear power and waste management, having the majority of the developed and developing countries (up to 80% of them) as members. The association promotes educational programs and international communication so a beneficial and sustainable solution to the energy crisis to be found. Finally, WNA has stated its conviction that nuclear power is the long term solution the world has been looking for under specific circumstances and guidelines, in co-operation with the International Atomic Agency (IAEA).

International Atomic Energy Agency (IAEA)

The IAEA is an international organization whose main goal is to promote the co-operation of all involved nations in the question of nuclear energy and find the most suitable solutions to reoccurring problems such as that of waste management. They operate with annual progress reports, scientific research sub-committees (ex. Department of Nuclear Safety and Security, as well as the Department of Nuclear Energy) and they are responsible for devising internationally recognized safety standards and guidelines. The aforementioned standards, especially on waste management are under constant evaluation by the IAEA Secretariat, who is further authorized

to cooperate with the UN for the reduction of health and environmental hazards. Member states turn to the organization wishing to solve financial and legal disputes as regards storing and desposing of nuclear waste altogether. In order to address them more effectively the Waste Management Advisory Program was founded in an effort to provide assistance to all countries wishing to utilize nuclear forms of energy. To this day the IAEA remains active in the pursuit of universally beneficial solutions.

Chemical Inspection and Regulation Service (CIRS)

CIRS is a China based association that offers its numerous clients, including companies from all over the world, testing and researching services as regards the toxicity of chemicals contained in their products and aims to reduce those percentages. Greatly valuing the integrity of their cause, according to their website, they offer the following services regarding the issue at hand: China Hazardous Chemical Registration, Chemical Risk Assessment, Toxicology Safety Assessment, Preparation and Verification of Product Registration Standard, Training Services, Hazardous Chemical Testing. The association could prove itself extremely helpful in monitoring radioactive waste produced by companies and reducing it, with some more research on the domain.

European Chemicals Agency (ECHA)

As an agency of the European Union, ECHA pledges to strive for the well-being of the people and the environment by protecting them from all harmful chemicals. It is responsible for implementing relevant legislations and for raising awareness for any harmful substances. It has several highly specialized sub-committees, including the *Risk Assessment Committee* that is responsible for evaluating companies and countries and preventing potentially threatening problems from arising. If the guidelines imposed by the Agency are not being followed the production is discontinued. However radioactive substances are currently exempted from their regulations.

TIMELINE OF EVENTS

Date	Description of event
1946	Nuclear waste being dumped in the Northeast Pacific Ocean for the first time.
1957	First IAEA meeting on the question of Waste Disposal in the Ocean.
1972-1975	The "1972 Prevention of Marine Pollution by Dumping of

	Wastes and Other Matter” ,better known as The 1972 London Convention aims to protect marine life from the disposition of wastes in the ocean.
1983	Prohibition by law on low-level waste dumping as a result of the aforementioned London Convention.
1986	Waste Management Advisory Program is established by the IAEA.
1992	Basel Convention, a multilateral treaty which aims to diminish the illegal dumping of hazardous waste from nation to nation became effective.
1994	Dumping of wastes in the ocean is prohibited altogether by the IAEA and the UN.
1998	Bamako Convention which is a multilateral treaty between African nations aiming to eliminate the import of radioactive waste became effective.
2016	IAEA workshop on the safety of underground disposal facilities.

RELEVANT RESOLUTIONS, TREATIES AND EVENTS

Resolution Adopted by the GA (A/68/411)

Resolution A/68/411 states that all member states are requested to take the appropriate measures in order to prevent the serious implications that reckless handling of radioactive wastes could result to.

1972 Prevention of Marine Pollution by Dumping of Wastes and Other Matter

Better known as the 1972 London Convention, this international protocol limits the materials that are not yet prohibited for ocean disposal and guarantees the thorough supervision of the process so as to ensure that ocean disposal remains the last resort and the objects making up the waste are not overly harmful to humans or to the environment.

Protocol to the Convention on the Prevention of Marine Pollution by Dumping Wastes and other Matter

The Protocol to the Convention on the Prevention of Marine Pollution by Dumping Wastes and other Matter was put in effect during the 1972 London Convention is renewed and amended to protect marine life as it had originally pledged.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

With over 180 signatures from states such as the USA (who has yet to ratify the convention) and most European countries, the Basel Convention was first signed on the 5th of May 1992. Aware of the disadvantaged position of LEDCS in managing hazardous wastes (explosive, flammable materials and those containing high levels of toxicity can be categorized as such) compared to the MEDCs and taking into account the large quantities shipped from the latter to the former, bans those transfers with hopes to assist developing countries to maintain the integrity of their environment and to prevent unmanageable amounts of waste being generated. However radioactive waste wasn't considered part of the "hazardous waste" category.

The Bamako Convention on the ban on the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa

Following the rapid advancements in the nuclear power generation process, countries of the African Union and especially LEDCs found themselves facing a similar problem as they did before the Basel Convention was put on effect. Amidst public uproar the lengthy negotiations regarding the banning of radioactive wastes from being shipped to African Union countries in conjunction to the Basel Convention started on the 30th of January 1991 and ended on the 22nd of April 1998 with the treaty being put on effect.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

There have been numerous efforts to pursue the form of energy believed to provide us with independency from any other source, but that hasn't been the case when in question to minimize the negative results it leaves behind and to avoid any more environmental and humanitarian destructions in the future. As it has been previously mentioned, LEDCs have been seen as intermediates for MEDCs to transfer their waste and dispose of them with minimum cost and nonexistent regard to the environment. In addition to that, attempts to tackle the problem in those areas, the Basel and Bamako Conventions for example, haven't been fully implemented. Unfortunate example, the United States as previously mentioned, that have signed the treaties but ended up not ratifying them because allegedly harms its national economy. It is policies like this that prevent any progress from being made in the long run. As regards the EPR policy, (Extended Producer Responsibility) that as the name suggests, producers and companies that contribute to waste augmentation should be held accountable for their waste, especially if it is of radioactive nature, and are called to take active measures to prevent it from accumulating, even though it has been adopted by most countries as regards managing the waste production in the given country, there's still a long way to go before it can be considered a contributing factor to managing waste. The foundation of the IAEA and the

establishment of strict guidelines and limitations on how radioactive waste should be handled was an important step to the right direction. Greenpeace has run several campaigns against nuclear power altogether and at the moment they're working to educate and recruit individuals for their cause under the name *"End the Nuclear Waste"*. Despite their efforts, their radical position could be the ultimate reason they've failed to achieve their goal so far. On the other hand, it would be unfair for us to assume that the activism of Greenpeace and similar regional organizations hasn't contributed to the problem whatsoever. It is due to them that public awareness has been raised and with the well-being of marine life in mind, dumping radioactive waste in the ocean has been prohibited since 1994, therefore taking the suggestions of burying it under the sea-bed and similar practices off the table of possibilities.

POSSIBLE SOLUTIONS

Through the years suggestions on dealing with the waste by prominent scientists include creating deep geological repositories, converting radioactive wastes to non-radioactive ones and even dispatching them to the sun. At present more research is needed in each field, in order for which to be possible the formation of UN funded sub-committees should be considered. Furthermore, as radioactive waste is commonly an aftereffect of mass production companies, it would be wise on the part of governments to enforce and monitor whether or not the EPR guidelines are being followed, without the exception of multi-national companies where the co-operation of multiple governments and even the UN is necessary. It is important for delegates to realize that in order for this measure to be more effective all parties need to be transparent with their activities and accept the consequences of overstepping the boundaries. Violators should be held accountable by perhaps enlisting the support of the authorized UN committees to impose heavy fines, while themselves ought to monitor the quality of the substances their raw-materials contain so as to reduce their waste. Furthermore, the large number of states that have not ratified the Basel and Bamako Conventions needs to be actively reduced. In order to promote that, public campaigns to educate the public on the crucial situation we're currently called to face as a global community, and even push for renewed and specific legislations on a national level as well. Lastly, the UN could seek the involvement of trustworthy third party agencies and services, such as CIRS and ECHA that are not at the moment active in the discussion and could provide the UN with valuable experience, having dealt with multiple other types of hazardous chemicals, and include them in its efforts. Moreover, delegates should ponder on the following questions before proceeding to write their resolutions.

"How can unity and co-operation in the international community be ensured while targeting the problem?"

“How can the UN come up with viable solutions to protect the present and future generations and how will those be applied?”

“What measures ought to be taken to prevent the mistreatment of radioactive waste in cases of war, conflict, or natural disasters?”

“What changes should be made in international policies and legislations (in both LEDCs and MEDCs) and what organizations could facilitate the process along with the IAEA?”

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