NAMUN'21

UNEP

Study Guide

#jointheworldsheartbeat

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Distinguished Delegates,

It is the utmost pleasure and honour to welcome you to the committee of the United Nations Environment Programme for NAMUN.

We have three agenda items that we will focus on during the sessions, which are:

1. Advancement of Nuclear Energy as a Reliable and Safe Resource
2. Taking Precautions Against Environmental Harm Caused by Abandoned Nuclear Facilities
3. Precautions to Preserve The Environment in The Process of War

I advise every participant to read the study guide well and absorb the policies of the country they will be presenting at this conference. To hold fruitful debates on our agenda items, the delegates shall also prepare themselves for both the problems they will discuss and the possible solutions of the said problems. Even though the study guide has given a well written background information about the topics and possible interpretations on them, I invite every participant of the committee to do their own research on the agenda items and the country they will be presenting.

I also want to thank the Secretary General İdil Yüzbaşıoğlu, the Director General Bahar Elif Bülbül, the Deputy Secretary General Mustafa Arda Teker and the Deputy Director General Zehra Ergen for allowing me to be a part of this amazing conference. Last but not least I want to thank Can Kadıoğlu for this informative and well prepared study guide.

I wish every participant of the committee an unforgettable and rewarding experience.

If you have any inquiries please do not hesitate to contact me through m.merve.ipek@gmail.com.

Under Secretary General of United Nations Environment Programme Committee of NAMUN

Merve Sena İpek

Cherished participants of NAMUN’21,

I, İdil Yüzbaşıoğlu, the secretary general of this year's Nesibe Aydın Model United Nations (NAMUN) would like to welcome you all to the 10th annual conference of NAMUN. Our academic and organization team both gave it their all to make this conference educational and fun for every attendee. All of our teams are more than grateful to welcome you all to our 10th year anniversary of NAMUN!

We faced many difficulties along the way, overcoming them one by one with the support we gave to each other. With both the academic and the organization team's hard work, we bring you NAMUN with its well planned committees and well planned coffee break activities to help you relax after a long session. This year NAMUN offers five committees: two beginner, three intermediate and finally a J.MUN. UNEP (United Nations Environmental Programme) , UNCSTD (United Nations Commission on Science and Technology for Development) , NATO (North Atlantic Treaty Organisation) , UNHCR (United Nations High Commissioner for Refugees) , CSW(Commission of Status of Women) our JMUN. UNICEF (United Nations Children’s Fund). All of these committees are fit to talk about the UN’s Sustainable Development Goals as we seek out solutions to real life problems we see everyday on the news.

In conclusion, our teams invite you to experience unforgettable memories, enhance your academic skills of presentation and debate, learn other people and countries' views of the world, and join the world’s heartbeat.

Welcome to NAMUN’21! Ten years, going strong.

Secretary general,

-İdil Yüzbaşıoğlu

1. Introduction to United Nations Environment Programme (UNEP)

The United Nations Environment Programme (UNEP) is the authority that is responsible for organizing the UN's environmental activities and assisting developing countries in adopting eco-friendly policies. It acts as an advocate for the global environment. Its mandate covers a broad range of areas, such as the environment, aquatic and land ecosystems, environmental governance, and green economic development. Since it is a member of the United Nations Development Group, UNEP also aims to help the world meet the 17 Sustainable Development Goals.

1.2. History of UNEP

UNEP was established by its first director, Canadian businessman and philanthropist Maurice Strong, in June 1972, as a result of the Stockholm Conference on the Human Environment. Over the years UNEP has worked on finding solutions to many environmental problems such as; pollution in the Mediterranean Sea, the threat to aquatic resources posed by human economic activity; deforestation, desertification, and drought; the depletion of the Earth's ozone layer by human-produced chemicals; and global warming. Over the past 30 years, it has mainly focused on climate change, helping the creation of environmental institutions and treaties like the UN Framework Convention on Climate Change. In 1988, it joined the World Meteorological Organization to establish the Intergovernmental Panel on Climate Change (IPCC), a UN body for assessing the science related to climate change. It has achieved many successes, such as the 1987 Montreal Protocol for protecting the stratospheric ozone layer by phasing out

the production and consumption of ozone-depleting substances, as well as the 2012 Minamata Convention, a treaty to limit toxic mercury. It has also led the International Environmental Education Programme with UNESCO during the years 1975-1999.

1.3. Functions of UNEP

The United Nations Environment Programme (UNEP) is the leading authority in the United Nations System that carries a lot of responsibilities. UNEP uses its expertise mainly to take environmental standards and practices to the next level along with helping implement environmental obligations at the country on regional as well as on global levels. The work programme of UNEP is organized into six areas of concentration that are; Climate Change UNEP, Post Conflict and Disaster Management UNEP, Ecosystem Management, Environmental Governance UNEP, Harmful Substances UNEP, and Resource Efficiency/ Sustainable Consumption and Production UNEP.

1.4. Sources of UNEP

The UN Environmental Programme is dependent on voluntary contributions for 95 percent of the income. The resources of UNEP, which are provided by their funding partners, are divided into three main sections: the *UN Regular Budget*, which supports the functions of the Secretariat, including the Governing Bodies, Coordination in the UN system and cooperations with global scientific communities; the *Environment Fund*, which is UNEP's core fund that supports the essential capabilities needed for the balanced and efficient delivery of UNEP's programme of work; and *Earmarked Contributions* which are earmarked funds for specific projects,

themes or countries that enable the expansion and replication of the programme of work and its results in more countries with more partners.

2. Advancement of Nuclear Energy as a Reliable and Safe Resource

2.1. History of Nuclear Technology

It all started when German physicist Wilhelm Roentgen discovered x-rays in 1895. The following year, in France, Henry Becquerel discovered that uranium salts could produce penetrating radiation on their own, without being excited by any external source. This led to the realization that uranium produces x-rays. Marie and Pierre Curie also studied this phenomenon and discovered two new elements: Polonium and Radium. This led them to coin the word “radioactivity” in 1898. While Ernest Rutherford was studying radioactivity in England, he discovered two new types of radiation: alpha and beta radiation. He also discovered that the majority of the atom’s mass was contained in its nucleus in 1909. He is now considered the father of nuclear physics. He then discovered gamma rays and theorized the existence of neutrons without having any evidence of their existence. Neutrons were discovered later on in 1932. These discoveries made the foundations of the nuclear energy production industry. In 1938, German physicists Otto Han and Fritz Strassman did an experiment where they shot neutrons at uranium atoms and saw that a significant amount of energy was being released. With the help of Lise Meitner and Otto Frisch, they explained what they had observed was the splitting of atoms through fission.

Then, in 1939, Leo Szilard and Enrico Fermi had an idea that fission reactions could be used to create explosions. Szilard and a few other scientists, including

Albert Einstein, warned President Roosevelt about the possibility of creating nuclear weapons. The President started the Manhattan Project to begin developing nuclear bombs for the US. In 1942, Enrico Fermi, working as a part of the committee, created the first man-made fission chain reaction in Chicago. This was when the project swung into full development. The team developed two types of bombs, one using uranium and the other using plutonium. The project was top-secret and entire covert cities were built for it. In 1945, by the end of WWII, nuclear weapons were used on people for the first time; atomic bombs were dropped in Japanese cities Hiroshima and Nagasaki. It was at this point that people realized how destructive this technology could be.

In 1951, the first nuclear reactor called Experimental Breeder Reactor 1 that produced electricity was made. Then, the first nuclear-powered submarine, the USS Nautilus, was completed in 1954. In the same year, the Soviets completed their first nuclear power plant. The construction of many more commercial nuclear reactors for electricity generation was made during the 1960s and 70s. In 1974, France started developing 75% of its power through nuclear reactors, meanwhile, 20% of the energy in the US was generated by nuclear power plants. However, in 1979, the future of nuclear power was starting to be questioned when an accident occurred on Three Mile Island. And then, when the Chernobyl disaster happened in 1986, releasing a cloud of radiation that affected a big part of northern Europe, global opinion began to shift against nuclear power.

After the disaster in Chernobyl, in the late 90s and early 2000s, there was a high degree of safety in nuclear power plants and no deaths caused by them in the US. The global opinion began shifting back to positive as the industry demonstrated high safety measures. However, the Fukushima disaster happened in 2011 when an

earthquake and tsunami led to a partial meltdown and the release of a large amount of radiation in Japan, reminding people that nuclear technology wasn't completely safe.

Currently, the United States is the world's largest producer of nuclear power. In 2017, it generated 805 billion kilowatt-hours of electricity using nuclear power, which makes up 32% of the 2.5 trillion kWh of nuclear power produced worldwide. In 2017, the top ten producers were:

Country	**Billion kWh produced**
United States	805.3
France	384.0
China	210.5
Russia	179.7
South Korea	154.2
Canada	97.4
Ukraine	81.0
Germany	80.1
United Kingdom	65.1
Sweden	60.6

2.2. Effects of Nuclear Technology

Nuclear energy is clean, efficient, and cheap. Around 10% of the world's electricity today is produced by nuclear power from about 440 nuclear reactors. It is the world's second-largest source of low-carbon power and there seem to be many advantages to it. But there are still disadvantages, if something goes wrong it can

create a nuclear meltdown, causing a huge catastrophe. But for many countries, the benefits outweigh its risks.

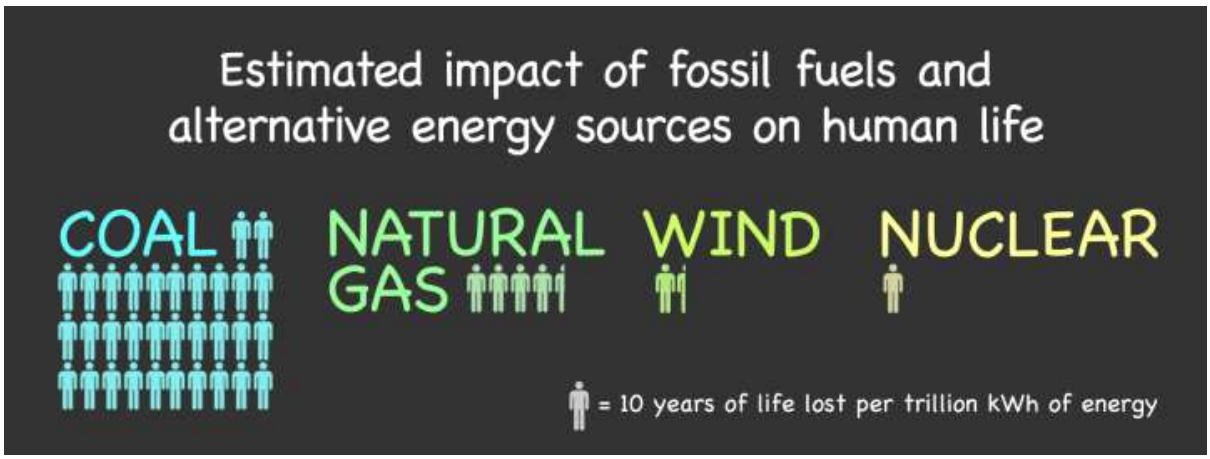
i. Effects of Nuclear Technology on Human Health

Many health risks arise from the presence of nuclear materials that emit radiation. Depending on factors like dosage, whole-body vs. partial body irradiation, internal vs. external exposure, age at exposure, etc., various kinds of health problems may arise such as thyroid disease, numerous types of cancer, other long-term health problems, genetic effects that can also appear in further generations and death. Apart from the radiological risks, many activities throughout the nuclear cycle require the use of heavy machinery and equipment and hazardous chemicals, which pose health risks similar to those now refueling might expect to find associated with any other large-scale industrial endeavor. Fuel cycle operations may cause physical injury from faulty machinery or fires and explosions, and physical injury, illness, or cancer may arise from exposure to hazardous chemicals. These effects may all be seen in workers. The radioactive waste produced may also cause such effects on humans.

There may also be cases in which an accident happens in a nuclear power plant, resulting in dreadful catastrophes. As demonstrated in the 1986 Chernobyl accident, nuclear power plant accidents can result in the release and dispersion of huge amounts of nuclear materials into the environment. Members of the public and workers may be exposed to high levels of

radiation, causing many serious health problems that may even affect further generations and death.

On the positive side, using nuclear technology can also have positive effects on human health. Fossil fuels produce many toxic by-products which are often released into the air, soil, and water, causing pollution and threatening our health. The World Health Organization has stated that urban air pollution causes 7 million deaths annually or about 1/8 of all deaths. Furthermore, coal power plants release more radioactive waste per kWh into the environment in the form of coal ash compared to nuclear power plants. Additionally, the European Union and the Paul Scherrer Institute found that nuclear power is the least deadly major energy resource, outranking coal, oil, gas, and even wind by a slight difference.



ii. Effects of Nuclear Technology on the Environment

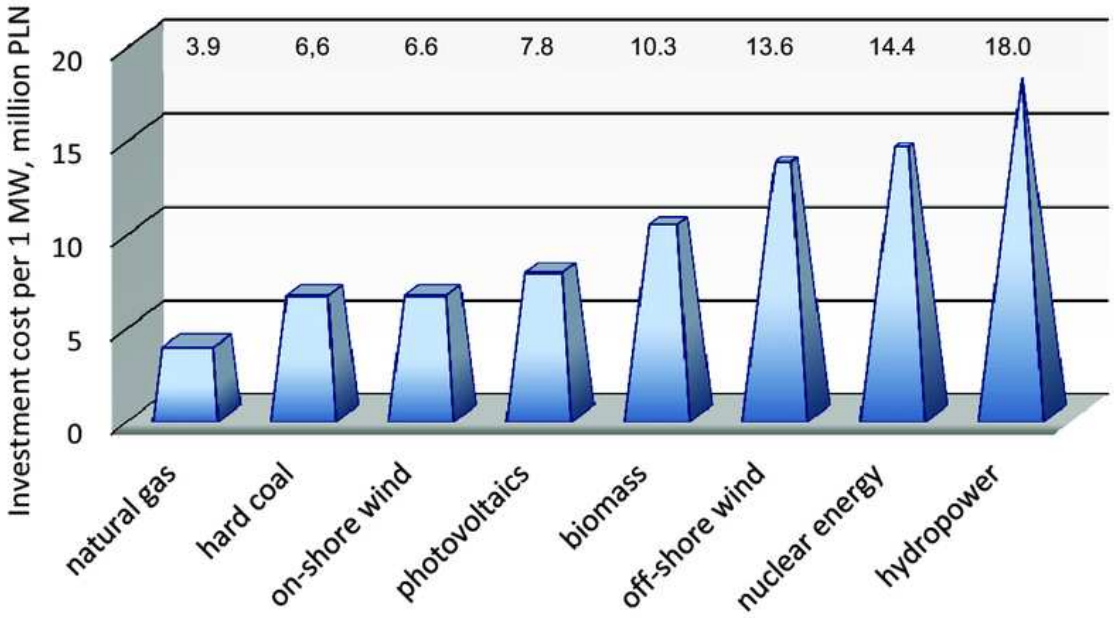
An uncontrolled nuclear reaction in a nuclear reactor could result in huge pollution and contamination of air and water. But the risk of this happening is very small because of the high safety measures taken in nuclear power plants.

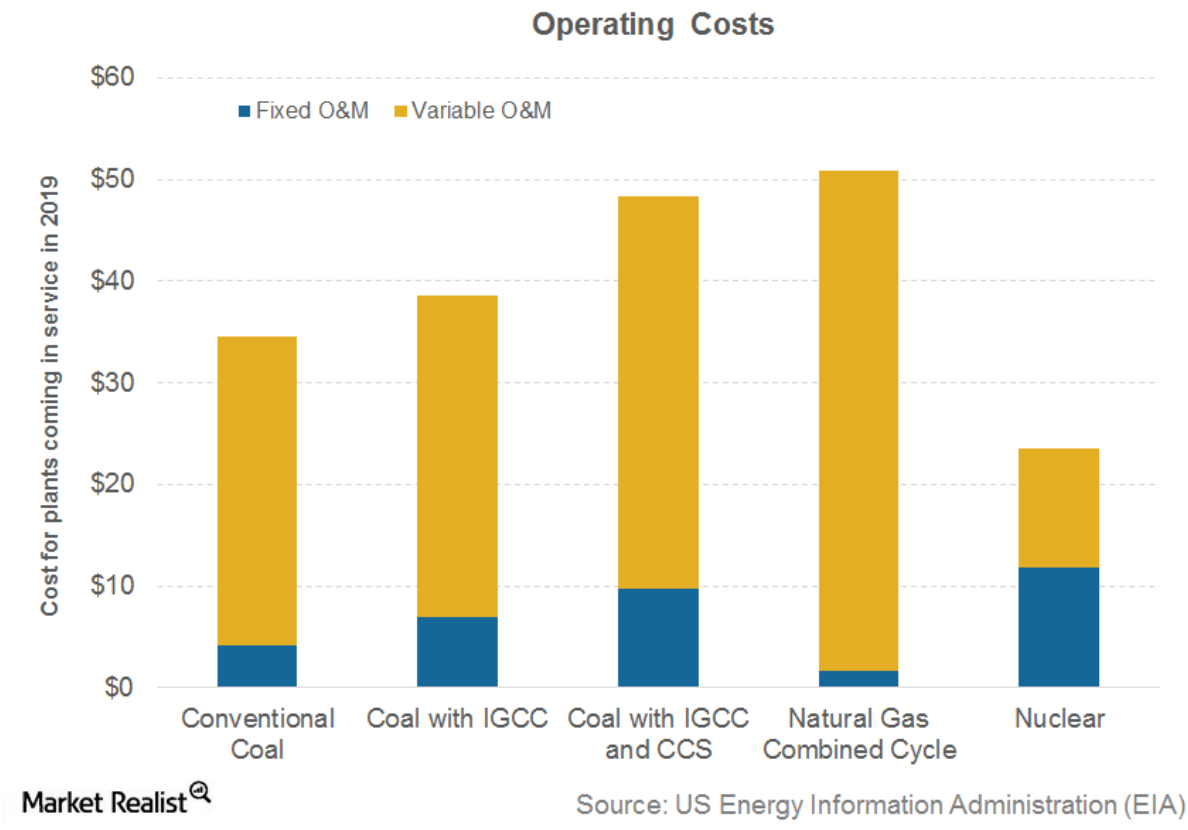
The biggest environmental concern related to nuclear technology is radioactive wastes such as uranium mill tailings and used reactor fuels. These materials can remain radioactive for thousands of years, causing a threat to the environment and human health. If not handled properly, it can cause genetic problems for many generations of animals and plants and cause harm to many animal species, therefore also harming the ecosystem and the balance of nature. It also requires large amounts of energy for the process of mining and refining uranium to produce reactor fuel.

It also has huge benefits for the environment. Unlike fossil fuel-fired plants, it does not pollute the air or produce carbon dioxide while operating and it has one of the smallest carbon footprints amongst energy sources. It is a good response to major climate change problems and global warming our world is facing right now refueling since it doesn't emit greenhouse gases.

iii. Effects of Nuclear Technology on the Economy

Nuclear power plants are very expensive to build compared to other types of power plants. The capital cost – the building and financing of a nuclear power plant- makes up a large percentage of the cost of nuclear energy. In 2014, the US Energy Information Administration estimated that capital costs of new nuclear plants will make up %74 percent of the levelized cost of electricity; higher than the capital percentages for fossil fuels (63% for coal and 22% for natural gas), but lower than some of the renewable energy resources (80% for wind, 88% for solar PV). Here are nuclear energy's investment costs compared with some other energy sources:





On the other hand, the operating cost of these plants is lower than almost all fossil fuel competitors.

And they’re expected to operate for at least 60 years or even longer in the future. They are currently the most reliable and stable source of energy: they run 24 hours a day, 7 days a week, and they only need refueling to depend on every 1.5-2 years. In 2018, a study showed that nuclear plants operated at full power at least 93% of the time. The nuclear industry also supports nearly half a million jobs in just the US and contributes on average 60 billion dollars annually to the US economy. Up to 700 people can be employed in one nuclear power plant with worker salaries that are 30% higher than the local average.

The costs and the efficiency of nuclear power plants still have room for improvement. For example, in the USA, operating costs per kWh shrank by 44% between 1990 and 2003, and the construction costs have also fallen considerably over time due to standardized design, shorter construction time, and more efficient generating technologies.

2.3. Security Threats of Nuclear Power

There is a big possibility of nuclear energy facilities being targets to terrorism; the principal attraction of these facilities as terrorist targets lies in the fact that they have the potential of creating a release of radioactivity big enough to cause a significant number of casualties and many long terms effects such as land, air and water pollution, and health problems that will soon start appearing in people. Destruction of depending important energy supplies in the targeted country and the possible shutdown of other nuclear energy facilities because of this threat would also be seen as a huge success by terrorists. Attacking a nuclear energy facility would be

very hard for terrorists to achieve, but would have dreadful consequences; hundreds or even thousands of immediate fatalities and thousands of delayed deaths from radiation-induced cancer could occur, and there would be very big economic damage from the contamination of the area.

2.4. Nuclear Weapons and Warfare

Nuclear weapons are unarguably the most dangerous weapons on earth. They can destroy whole cities, potentially killing millions, and jeopardizing the natural environment and the lives of future generations. Although they have been used only twice in warfare until now – in the bombings of Hiroshima and Nagasaki in 1945- there are still around 14500 reported nuclear weapons in our world today and over 2000 nuclear tests have been conducted to date. Here are all of the world's current nuclear weapons:

Country	**Stockpiled**	**Deployed**	**Retired**	**Total**
Russia	4490	1461	2000	6490
United States	3800	1365	2385	6185
France	300	10	?	300
China	290	0	0	290
United Kingdom	200	At least 40	?	200
Pakistan	150-160	0	0	150-160
India	130-140	0	0	130-140
Israel	80-90	0	0	80-90

North Korea	20-30	?	0	20-30

The impacts of a nuclear explosion depend on many factors, such as the design of the weapon and its yield, whether the explosion happens in the air, on the surface, underground or underwater, the meteorological and environmental conditions, and whether the target is urban or rural. These factors affect the blast, thermal radiation, initial radiation, residual radiation, fallout, and electromagnetic pulse caused by the explosion.

2.5. Nuclear Safety

Nuclear safety, by the definition of the International Atomic Energy Agency, is “the achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation hazards”. It is also defined by the IAEA as “the prevention and detection of and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities”. This covers all nuclear facilities, the transportation of nuclear materials, and the use and storage of nuclear materials for the medical, power industry, and military uses. It is very important and very serious measures must be taken in all of these facilities and processes.

i. Nuclear Power Plant Safety and Security

There are three primary objectives of nuclear safety. The first one is to protect individuals, society, and the environment by establishing and maintaining effective defense labor against radiological hazards in nuclear power plants. The second one is to ensure that radiation exposure in normal operation within the plant or released from the plant is as low as reasonably achievable and below prescribed limits. The last one is to prevent accidents in nuclear plants and ensure that all probabilities are taken into account, even if they are extremely unlikely. Safety must be ensured in all stages of the nuclear fuel cycle.

The structure of the nuclear power plant must be made out of materials that have the capacity of shielding the outside environment during both normal operations and emergencies. Appropriate measures must be taken in the power plant to maintain ideal conditions. Multiple barriers must be built in the power plant for different purposes, including the containment of radioactive materials, radiation protection, fire protection, physical protection, etc. The design of the power plant must ensure that accidents will cause no harm or minimal harm.

ii. Storage and Disposal of Nuclear Waste

The most challenging part of the nuclear fuel cycle is the proper disposal of waste materials. These materials come in different forms such as solid, liquid, and gaseous. All types of waste have their method of disposal, and they should be disposed of in a way that does minimal harm to humans, flora, fauna, and the natural environment. The liquid wastes are segregated,

filtered, and conditioned; and after adequate dilution, they are disposed of to the environment water body. Solid wastes are disposed of in brick-lined earthen trenches, reinforced cement concrete vaults, or tile holes, depending on their level of radioactivity. They can also be stored in steel cylinders along with inert gas and water to be completely sealed. This acts as a radiation shield for nuclear waste and is a relatively cheap way to store radioactive waste. But there are many concerns about some methods of disposal used for radiological waste because there is a risk of the waste leaking into the environment if a huge geological change occurs (e. g. earthquakes).

iii. Nuclear Emergency Preparedness and Response

Although the likelihood of a nuclear emergency happening is very small because of all the safety measures taken, there should be an emergency preparedness plan for every power plant and all the personnel in the plant must be properly trained. According to a report published by the NRC and the U.S. Environmental Protection Agency, a nuclear plant accident would be experienced in the 10-mile radius area of the plant; at greater distances, the concern would be about food and water contamination. Therefore, there should be plans prepared for 2 different zones: the 10-mile radius and the 50-mile radius. There should be full-scale emergency response exercises made in every power plant 2 times a year. In the case of an emergency, the power plant and the surrounding area must be immediately evacuated and the power plant should be shut down and sheltered to protect the public and the environment.

iv. Protecting the Health of Nuclear Workers

People working inside nuclear facilities need to be constantly monitored for the exposure of radiation as a result of their job operations. The standards laid down in this regard should be strictly followed and the working environment should be regularly checked. Workers can be exposed to a maximum of 30 mSv of radiation in a year and the average exposure over 5 consecutive years should not exceed 20 mSv/year.

Unfortunately, many laborLevelized onLevelized on issues remain in the industry, impacting the lives of many workers and their families. A subculture of frequently undocumented workers does the dirty and potentially dangerous work in many nuclear facilities. And, when these workers exceed their radiation exposure limit at a facility, they often migrate to another one. The World Nuclear Association stated that the workforce of these “nuclear gypsies” has been a part of the industry for at least four decades. Existing labor laws protecting workers’ health rights aren’t always properly implemented as well. Records are required to be kept, but they often aren’t.

v. Nuclear Peace and Disarmament

Nuclear disarmament is the process of reducing or eliminating nuclear weapons. It’s also often referred to as “denuclearization”. Many experts on

this topic see nuclear weapons as one of the biggest threats in front of us and urge complete disarmament. It is predicted that the next nuclear explosion could wipe out the earth. Although many people defend nuclear weapons by saying they have helped maintain peace on earth, their existence causes a huge threat: a misconception or miscommunication between world leaders could lead to a horrible disaster when nuclear weapons are present.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is an international treaty whose objective is to prevent the spread of nuclear warfare and to promote the peaceful uses of nuclear energy. The treaty was negotiated between 1965 and 1968, by the Eighteen Nation Committee on Disarmament which is an UN-sponsored organization based in Switzerland. The treaty entered into force in 1970. As required by text, in 1995, NPT parties came together again and agreed to extend the treaty indefinitely. As of August 2016, 191 states have become parties to the treaty, though North Korea announced its withdrawal in 2003.

2.6. Sustainability of Nuclear Energy

Overall nuclear energy can be considered a sustainable energy source because it has no carbon footprint, it's very efficient, it produces minimal waste and it has a small land footprint (a typical 1000-megawatt nuclear power plant requires just a little more than 1 square mile). It could become even more sustainable if the source of uranium changed from mined ore to seawater, making it completely renewable. The amount of uranium in seawater is just 3.3 micrograms/liter, but that makes up a total amount of 4.5 billion tons of uranium. Just because it isn't

renewable right now doesn't mean it's not sustainable either. Even renewable energy resources become unsustainable when they're used faster than they regenerate; on the other hand, a non-renewable energy source can be sustainable if it's used for a slow enough rate that supplies the last thousands of years.

3. Taking Precautions Against Environmental Harm Caused by Abandoned Nuclear Facilities

In the context of this guide nuclear facilities refers to any site that was used for testing and usage of nuclear technology in the past. This could include atomic bomb testing sites, old nuclear reactors, and nuclear waste storage facilities. As discussed in the following paragraphs, these facilities can be incredibly detrimental to the environment, as such it is of utmost importance that they are protected and regulated to stop any disaster before it can even happen.

3.1. The Effects of Nuclear Facilities on the Environment

Broadly speaking, the effects of nuclear facilities on the environment can be observed in two forms: nuclear waste created as a by-product of nuclear energy generation and nuclear fallout which is a case where nuclear ash falls from the sky because of an explosion.

i. Radioactive Fallout

Radioactive fallout is a case where tiny radioactive ash particles are shot way up in the atmosphere as a result of an explosion caused by a bomb or reactor. As the nuclear ash falls back to the ground (hence the term fallout)

after being carried hundreds of kilometers by the strong winds, they emit strong ionizing radiation that seriously damages any living organism. The damages could include radiation burns, radiation sickness, cancer, poisoning, and even death. The fallout has an even worse effect on the ecosystem where the nuclear dust falling from the air contaminates the water and the ground staying there until they decay. According to the EPA (Environmental Protection Agency), this has the consequence that the heavy nuclear elements that have a long decay time such as strontium-90 and Cesium-137 with decay times of almost 30 years are absorbed by the plants, animals, and all kinds of living organisms.

The length of the fallout might vary depending on the severity of the explosion, type of technology used, the materials used, the siting, etc. While the short-term effects last only up to 5-6 years at most the long-term effects of the fallout can last for decades.

ii. Radioactive Waste

Nuclear waste is created as a by-product of energy generation in nuclear power plants. Specifically, it is what's left of the uranium fuel after it is all used up in the reactor creating incredibly toxic elements such as cesium, strontium, and plutonium with the last one having a half-time of 24000 years. These elements, although radioactive, are not compatible with the current nuclear reactor designs and they have to be stored as releasing them into the ecosystem would have catastrophic consequences as stated above.

iii. Examples of Nuclear incidents affecting the environment

Throughout history, there have been countless examples of nuclear wastes and fallout harming the environment. Some of the damages done by these incidents were so severe that their effects can be observed to this day.

Chernobyl

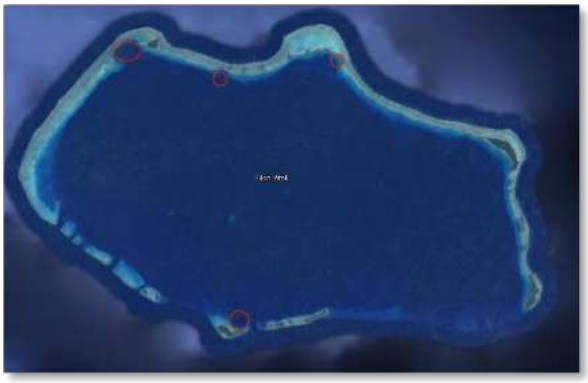
The Chernobyl incident was a case of a nuclear reactor in the Soviet city of Pripyat undergoing a meltdown and exploding. The explosion shot up thousands of tons of nuclear ash high into the atmosphere causing it to be blown away hundreds of kilometers by the strong winds. The effects it had on the environment were devastating as the power plant was located next to the Pripyat River which is a part of a much larger water system. This caused major rivers to be contaminated with extremely radioactive and toxic materials which in turn resulted in a shortage of safe drinking water and agricultural water. The disaster also had an impact on the wildlife where acres of forests died out due to exposure to high levels of ionizing radiation.

Bikini Atoll

During the cold war, Bikini Atoll was a testing ground located in the Pacific Ocean for nuclear weapons created by the United States. A total of 23 thermonuclear weapon experiments were conducted here seriously damaging the local marine life. With the surface seawater

temperatures reaching up to a scorching 55000 °C most of the coral reefs were instantly vaporized.

The locals also had to be relocated to protect them from the radiation. But even after all the experiments were concluded they could not return home because of the nuclear ash left behind.



Source: Google Maps

3.2. Solutions Found by The International Atomic Energy Agency

In the UN extraction of nuclear materials, regulation of nuclear power plants, containment of radioactive material, and disposal of nuclear waste are regulated by the International Atomic Energy Agency or IAEA. Since its conception, the IAEA has created many conventions that all member nations follow. The conventions most relevant to the topic of this guide are: “Convention on Nuclear Safety”, “Joint Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management”, “Convention on Early Notification of a Nuclear Accident”, and “Convention on Physical Protection of Nuclear Material”.

i. History and Functions of IAEA

The IAEA was founded as a part of the UN in 1957 with the initiative of the US President Eisenhower to ease the growing tensions in a post-war world that was just starting to understand the potential power and danger of nuclear technology. Today they regulate and research the use of nuclear technology, assist nations trying to switch to nuclear energy, and handle emergencies in case of an accident.

ii. Conventions Put in Place by the IAEA

The IAEA has written many conventions and codes of conduct that are not hard fastened rules but are more like a guideline to every member state about how to ensure nuclear safety. There are many of them, but this guide focuses on only 4.

Convention on Nuclear Safety

The Convention on Nuclear Safety is a list of obligations that each member state must follow. It consists of 15 articles and could be compiled under broader categories. First of all, the Convention requires that all member states have some kind of legislation over nuclear safety written in their legal framework and it requires that all member states have a body regulating these laws properly. To ensure all states abide by this obligation they are required to report all of the measures taken in their land to the IAEA. The convention also requires that all member nations allocate an appropriate amount of financial and human resources (that must be qualified) to the safe operation of nuclear facilities. As a more specific point, the states are obligated to protect

the staff of nuclear facilities and the public from possible dangers of radiation. They are supposed to prescribe a national limit that will be reviewed by the IAEA and make sure that nuclear facilities do not emit radiation above the accepted threshold. The states are also required to be prepared for any case of emergency. The emergency plans and equipment are to be routinely tested and the tests will be reviewed by the IAEA. The design and operation of any nuclear facilities also have to be approved by the IEEE. The member states will have to abide by this convention to ensure nuclear safety is kept in their area.

Joint Convention on the Safety of Spent Fuel Management and on Safety of Radioactive Waste Management

This convention is the list of rules governing the management of nuclear waste. It contains almost 3 times the number of articles written in The Convention on Nuclear Safety. The 44 articles are divided under 4 chapters. To begin with, The Convention requires that all member states take appropriate measures such as writing laws and enforcing them to ensure the safety of individuals, the society, and the environment. The laws should take interdependencies of spent fuel management processes and the hazards of nuclear wastes into account. The convention also requires nations to have some kind of spent-fuel management facility that is sited in a place where it can't cause harm to the people and the environment. The design of these facilities is also to be reviewed by the IAEA. These facilities have to be

regulated and inspected routinely and these inspections have to be reported to the IAEA. The member lands are also under the obligation to write and enforce laws that forbid the disposal of nuclear waste on unapproved locations.

Convention on Early Notification of a Nuclear Accident

The sole purpose of The Convention on Early Notification of a Nuclear Accident is to ensure that everything stays under control in case of an emergency such as a reactor meltdown. It holds all the member states under the obligation to report any accident immediately, without any delay to the IAEA. The local legislative authorities are not to be involved in the incident before it is properly reported so as to avoid any lag in the communication. The time, exact location, type of the incident, and information about radioactive materials involved must be provided so that the IAEA can properly assess the situation. The nations also have to write and enforce laws ensuring that any nuclear accident is directly reported to the local authority without any delay. On a related note, states must know the situation of every nuclear facility operating in their land area. The IAEA should assist in taking care of any incident as long as it is reported as quickly as possible.

Convention on Physical Protection of Nuclear Material

The Convention on Physical Protection of Nuclear Material has the purpose of stopping any illegal trade and transport of radioactive

materials. Like all the above-given conventions it requires all the member states to write and enforce laws controlling the trade and transport of radioactive materials. It also forbids all member states from importing and exporting any radioactive materials without any approval from the authorities. States should also try to stop any theft, unauthorized use and alteration on the said material and should let the IAEA know if there is such an event.

4. Precautions to Preserve the Environment in the Process of War

We can examine the effects of preparation for war on the environment in three main groups.

4.1. Military Based Effects

Human Security becomes more and more important as the war continues which leads to significant impacts on the environment.

Military activities consume a lot of fossil fuels for weapon ammo and tactical trials before the war, which leads to the secretion of unwanted amounts of greenhouse gases. Also at the creation of hazardous weapons like gas bombs, the environment gets even more polluted as the need for more hazardous materials increases. Armed forces from around the world were responsible for the emission of two-thirds of chlorofluorocarbons (CFCs) that were banned in 1987 for causing damage to the ozone layers. Also, naval accidents during the Cold War have dropped at a minimum of 50 nuclear warheads and 11 nuclear reactors into the ocean; they remain on the ocean floor which cannot be taken.

4.2. Social Effects

It requires the establishment of arms and ammo warehouses and bases of military airports on large lands. Millions of acres of land devoted to the production, storage, and testing of weapons (chemical, biological, nuclear, conventional) are highly polluted today, and even if military use is stopped, it is virtually impossible to reintroduce to natural life. Large pieces of land are also needed for military exercises. During these exercises, the entire natural structure is destroyed due to various reasons such as land and air bombings, tank, and armored vehicle movements. As a result, environmental impacts such as soil pollution, pollution of groundwater and groundwater resources, air pollution, and damage to wildlife in that area occur. Nevertheless, military bases require a huge landscape too, which causes some unwanted villages to get redesigned. It forces the villagers to migrate, which affects the social lives of people.

4.3. Political Effects

Political Effects occur mostly after huge wars. Wars that wrote their names in history like Vietnam, Africa, and World Wars affected the environment with chemical and nuclear weapons which led the landscape to lose its mold. Natural ecosystems collapsed on land. Chemical bombs blasted seas and destroyed their balance. As a result, countries that were affected by these changes encountered drought, deforestation, deterioration of territorial integrity, and food and nutrient loss. These after-effects made countries break their bonds with others.

4.4. Effects of War on the Environment

Different types of effects begin to occur as the war goes on. Some effects even last longer than expected which causes huge damages for countries. We group these effects as the process and the after-effects.

4.5. Effects in the process of the War

The wars have become even more devastating with the weapon technologies developing in the 20th century. Chemical, biological and nuclear weapons, long-range missiles, air bombings have both targeted civilians and have caused more and long-term environmental damage. As an example, the modern weapons used in the Kosovo and Gulf Wars have been lethal with their explosive effects, toxic chemicals, and radiation they contain, and have had a devastating effect on the environment. During the First Gulf War, millions of barrels of crude oil spread to the Persian Gulf, thousands of seabirds died and the oil wells in the desert were destroyed, animals and plants suffered ecological deterioration and disappeared. Also, the spread of tons of polluted gas into the atmosphere caused black snowfalls in Kashmir and oily black rains in Iran and Saudi Arabia. The gain in the use of illegal resources, usually in the war zones, allowed a handful of people to prosper, such as local dictators, and various groups to buy plenty of weapons. But for most indigenous peoples, these conflicts led to human rights violations, humanitarian disasters, and environmental devastation, and eventually pulled these countries down to the minimum of human development criteria.

4.6. Effects that resume after the War

Today, the long-term negative effects of modern weapons on the environment have caused people to struggle with the enormous environmental destruction that

occurred after the war. Infrastructure rendered unusable by bombings, forests destroyed, inefficient soils, radioactive pollution, groundwater, and groundwater resources that have been rendered unusable have caused human losses and even large migrations in the post-war period. While these migrations often caused excessive population movements in the migrated region, they also caused environmental problems. Also, the fact that people change countries may cause conflicts or instabilities in the abandoned country, destination country, or region. Land mines laid during the war also cause serious civilian casualties after the war. The collection of landmines aren't easy but the price of them is cheap. For this reason, thousands of acres of land, especially agricultural areas, are closed to use in the old conflict areas.

4.7. Conclusion and Offers

Wars have a lot of harsh results for the environment. To minimize the damage caused, the necessity of minimizing threats to human life and the environment during the war with preparedness and protection of civilians is one of the most important lessons to be learned. Appropriate evaluation and cleaning work should also be done as soon as the war is over. Efforts should be made to bring the post-war country into an international and regional cooperation environment, especially when it comes to natural resources such as water. We need more solutions that do not contain more violence.

5. Questions to be Answered

- Is it possible to ensure global nuclear safety while simultaneously promoting its usage and assisting nations with the building of power-plants?
- Should other energy resources be ditched in favor of nuclear energy?
- How could it be ensured that nuclear energy is used for the betterment of mankind and not for weapons and such?
- What are the pros and cons of using nuclear power?
- How can nuclear power become more sustainable?
- Which measures should be taken to make nuclear power safer?
- How should nuclear emergencies be handled?

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