Forum: United Nations Educational,Scientific and Cultural Organisation

Issue: Measures to mitigate the risk presented with the expansion of nuclear energy worldwide

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Introduction

As the world faces an ongoing climate crisis, and as global warming rises and nations and corporations begin to make the push towards sustainable energy, nuclear energy looks to be an attractive and lucrative option for most. Outlining this with the fact that nuclear energy is cost-effective, produces an incredibly small carbon footprint, produces zero carbon emissions and has high energy density, has led to its expansion worldwide in the fight for the replacement of fossil fuels to combat climate change.

However, as the world scrambles for this new alternative source for power, nations and organizations must take a clear step back and analyse the risk that is presented when it comes to the universal adoption and expansion of nuclear energy worldwide. Today, more than 400 commercial reactors operate in more than 30 countries. UNESCO aims to protect the strides made by the push to nuclear energy and away from fossil fuels, but also aims to mitigate any possible risk that may come through an adoption of nuclear energy worldwide.

The United Nations Educational, Scientific and Cultural Organization, in particular, takes into account what effects nuclear mitigated risks can have on surrounding countries as well due to the spread of radiation. One particular example would be the Chernobyl Disaster which occured in the Soviet Union, during 1986, and caused nearly $7 billion worth of property damage internally. However, the radioactive fallout from such an incident had led to spread all over Europe, even as far as to France.

The radiation fallout to other countries in Europe, had caused around 4,000 cancer related deaths, and 2,000 infections, according to the World Health Organization.

The United Nations Educational, Scientific and Cultural Organization, actively works with other United Nations backed bodies, such as the International Atomic Energy Agency, to address the risks of mitigation when in regards to nuclear energy. UNESCO in particular, along with bodies such as the IAEA, are working together and increasing co-operation to avoid tragic incidents, such as the Fukushima Daiichi Nuclear Disaster in Japan, during 2011 which was caused by the Tohoku Earthquake and Tsunami, and due to the powerplant inherent building structure, led to a radiation explosion thanks to the incoming Tsunami. The following accident led to mass radiation exposure which still remains till this day.

Definition of Key Terms

Nuclear Energy

Nuclear Energy refers to power and electricity created by the use of nuclear reactions through nuclear fission, decay and fusion. It is a form of energy which is created and released from the nucleus, the core of atoms, made up of protons and neutrons.

Nuclear and Radiation Accident

A nuclear related event which has led to significant physical consequences to people, the environment or a facility thanks to the operation of nuclear energy or other radioactive substances. Nuclear and Radiation Accidents usually cause a variety of illnesses upon their existence.

Nuclear Meltdown

A nuclear meltdown occurs after significant overheating results within the reactor core. When the heat produced by a nuclear reactor exceeds the heat absorbed by the cooling systems to the extent that at least one nuclear fuel element reaches its melting point, a core melt accident occurs. In contrast, a fuel element failure is not brought on by high temperatures. A meltdown may be the result of a criticality excursion, in which the reactor is operated at a power level above its design limitations, or it may be

brought on by a coolant loss, a coolant pressure loss, a low coolant flow rate, or any combination of these factors.

Radioactive Waste

Radioactive Waste refers to waste that is hazardous, contaminated with radioactivity or caused by radioactive materials. Radioactive waste can also be maintained as a byproduct of nuclear radiation thanks to processing facilities. The following can be achieved through nuclear medicine, research or generation. The main issue with radioactive waste pertains to sicknesses that are inflicted upon any unsuspecting organism which interacts with such, as cancers and other known diseases are known to be passed around through radioactive waste.

Nuclear Warfare

Nuclear warfare refers to the theory of atomic/nuclear warheads being used within conventional warfare. Nuclear warfare has been expanding rapidly ever since the start of the Cold War conflict between the United States and the Soviet Union, and as more states have gained nuclear weapons, the threat of nuclear warfare has become more widespread and has turned into a global crisis as a whole.

Key Issues

Nuclear Radiation Accident

A nuclear radiation accident is the resulting fallout of a nuclear reactor exploding due to external problems such as a malfunction or some sort of overheating. This can also be due to an external problem such as during the Fukushima Nuclear Disaster of 2011, when a typhoon arrived and swept the Fukushima nuclear plant away which caused a massive implosion which blew up the nuclear facility, and had caused 573 deaths due to a nuclear radiation accent, and more so through various diseases spread through by radioactive waste.

Nuclear Warfare

Nuclear warfare is one of, if not the most pressing issue when it comes to the question of nuclear weapons. Nuclear warfare is a conventional nuclear strategy intended to be

used during conventional warfare to further weaken a state. Nuclear weapons have been described as the "most pressing issue" for the safety of humanity since the existence of the Atom Bomb, which was used on Hiroshima and Nagasaki respectively by the United States of America during the Second World War. Thankfully, this has been the only time nuclear weapons have been used in conflict. Furthermore, as more states have acquired nuclear weapons, more nuclear standoffs have been put into place. Many experts consider a few parts of the world as "nuclear hotspots". One such nuclear hotspot is Russia and Ukraine. As the war in Ukraine has intensified, the Russian Federation has considered the application of deploying nuclear weapons against the Republic of Ukraine. This has also been intensified by countries such as the United States, France and the United Kingdom, as these nations maintain their own nuclear programs and are heavily allied with the Ukrainian government's fight against Russia. Another particular nuclear hotspot of concern remains the Korean Peninsula. The Democratic People's Republic of Korea, has launched constant nuclear threats against Japan, the Republic of Korea and the United States, which has usually come in the form of ballistic missile tests.

The Acquisition of Nuclear Weapons by Non State Actors

With the sharp rise in Violent Non State Actors, in particular, militia groups, a renewed concern has been established when it comes to violent state actors. In particular, this has been executed by the coup by the Taliban of the government in Afghanistan, and the expansion of their proxies into countries such as Pakistan, which is a nuclear state. Another example would be Hamas, a Palestinian militia group, gaining control of possible Israeli nukes. Furthermore, the prospect of a non-state actor acquiring nuclear weapons is particularly concerning as they do not maintain the same stability that an organized nation state or government. This is proactively true when looked at within the organization of such militia groups and non-state actors. Within nation states, there usually is one court, organization or position of power to counteract a head of state or head of government giving the order/authority to launch a nuclear weapon, however, in rugged and disorganized militia groups, such a power

balance ceases to exist in most cases, making the prospect of a nuclear terror group even more frightening.

Major Parties Involved and Their Views

The United States of America

The United States of America has long been a key leader in the development of nuclear energy. Several agreements have been signed by the U.S Congress such as the Price-Anderson Agreement, to promote a civilian expansion of nuclear technology. This has led to a rapid expansion of nuclear technology in the United States, and has also resulted in specific nuclear disasters, such as the reactor explosion on Three Mile Island in the 70s, during the Nixon Presidency. Furthermore, the United States of America has been subservient to multiple nuclear standoffs, such as the Cuban Missile Crisis where the Soviet Union had stored nuclear weapons of the coast of the Communist aligned Cuba or the German standoffs, which saw the United States and Soviet Union deploy nuclear weapons to East and West Germany. These have largely been marked the closest events that the world has come to nuclear warfare. The United States operates the most amount of nuclear energy in the world, once again, spread throughout the nation thanks to the auspices of the Price-Anderson Agreement.

The Russian Federation/Union of Soviet Socialist Republics

The Russian Federation, since its Soviet days, has long tried to harness nuclear power for its civilian use. This was expanded upon by the leadership of Premier Leonid Brezhenev and Premier Mikhail Gorbachev under the Soviet Union. Russia has tried to lessen the extent of this after a massive nuclear disaster in the 90s. An emphasis on the expansion of nuclear weapons was placed during the Cold War after the bombings of Hiroshima and Nagasaki conducted by the United States of America. This led to the Soviet Union acquiring nuclear weapons in a race to counter the United States, known as the Global Arms Race. In recent times, the Russian Federation has greatly expanded it’s nuclear energy capabilities, particularly under President Vladimir Putin. Roughly 20.28% of all energy generated in Russia has been done through nuclear power and nuclear energy. At the present, Russia currently has 37 active domestic reactors, and has built reactors overseas in nations such as Turkey, Bangladesh,

Belarus, India, Slovakia, China, Finland and more. Most Russian nuclear generation is conducted within the European side of Russia.

The United Kingdom

The United Kingdom along with eight other nations, possess nuclear weapons. The United Kingdom was the third nation to acquire nuclear weapons as a whole. At the present, the United Kingdom also operates a large amount of nuclear energy and nuclear power plants within its nation. The first reported test conducted for the acquisition of nuclear energy within the United Kingdom happened on 3rd of October, 1952, and was dubbed "Operation Hurricane." The test took place in Western Australia, and officially established Britain's place as a nuclear power. At the present, British Prime Minister, Rishi Sunak, and French President, Emmanuel Macron, have agreed to enter into a mutual cooperation agreement regarding the expansion of nuclear energy.

The Fifth French Republic

France is the biggest user of nuclear energy in Europe, and one of the biggest in the world. Ever since the mid 1980s, nuclear energy has been the largest power source in France. Since around Mid 2020, France has a total of 56 nuclear reactors, the largest of any nation in Europe excluding Russia. After the United States, France boosts the world's largest atomic fleet, made mostly of nuclear powered submarines. France achieved its nuclear weapons during the early 1960s, where Operation: Gerboise Bleue, led to France acquiring its first nuclear weapon. In the present, French President Emmanuel Macron has committed to more nuclear energy cooperation with British Prime Minister, Rishi Sunak.

People's Republic of China

The People's Republic of China or PRC, much like France, is one of the world's largest producers of nuclear energy. In total, China ranks third behind France and the United States, as the nation which uses the most amount of nuclear energy in the world. As China is the world's largest polluter, nuclear energy has become an attractive and lucrative substitute to coal and other fossil fuels for the People's Republic due to the high amounts of air pollution within the country. China conducted it's first nuclear weapons test in early 1964, dubbed "Project 956" over Lop Nur,

Xinjiang. China had pursued nuclear weapons after the first Taiwan strait crisis, where it realized that the United States nuclear umbrella would always protect and shield Taiwan. Today, President Xi Jinping of China has largely expanded nuclear energy throughout Central and South-East China.

Republic of India

As India develops and modernizes, nuclear energy has begun mass adoption within the nation. As compared to other nations, India operates a different sort of nuclear energy power plan, one created by Homi Bhaba, and allows India to keep relative energy independence when it comes to nuclear energy. At the present, nuclear energy is the fifth largest source of energy in India, although it is rising quickly. India has a total of 22 nuclear reactors and roughly 8 nuclear power plants, with 5 new plants on the way. Much like China, India is a polluter due to its large population, therefore, nuclear energy is seen as a lucrative and attractive solution to the phasing out of fossil fuels. India had tested it's first nuclear weapon during the early 1970s, in the town of Pokhran, and the Operation was dubbed "Smiling Buddha". In the present, India has expanded both its civilian nuclear energy and the amount of nuclear warheads it owns.

Development of Issue/Timeline

Date	Event	Outcome
December 5th, 1938	Nuclear Fission was discovered by German chemists Otto Hahn and Fritz Strassmen and physicists Lise Meitner and Otto Robert Frisch.	Led to the possibility of nuclear atoms being split into two, which further accelerated the notion or idea that a nuclear weapon could be established.
22nd April, 1939	Work on the first atomic bomb begins in Nazi Germany under	Information and scientists collected from the German program led to the United

	the condem of the “Uranvein” or “Uranprojekt”.	States forming its own atomic weapons program.
9th October, 1941	President Franklin D. Roosevelt of the United States of America, approves Project Manhattan, an effort to build the first atomic bomb to be used on Germany.	The bomb is built under the careful instruction of J. Robert Oppenhimer at Los Almos Labratory, New Mexico, with the help of Canadian and British scientists and experts.

August 6th, 1945 and August 9th, 1945	President Harry S. Truman approves the nuclear bombings of Hiroshima and Nagasaki respectively to end World War Two early, marking the only times nuclear weapons have been used in conflict.	Millions die due to vaporization and sickness. Japan ultimately surrenders to Allied Forces.
29th August, 1949	The USSR officially completes its first nuclear test at Semipalatinsk-21 and acquires nuclear weapons.	The global arms race between the USSR and the United States officially begins.
3rd October, 1952	The United Kingdom tests its own nuclear weapon, dubbed “Hurricane ".	The United States and the Soviet Union no longer maintain a monopoly on nuclear weapons.

November 1st, 1952	The United States tests its first thermonuclear device during Operation: Ivy.	A new range of nuclear weapons are established, and the arms race is expanded.
August 8th, 1953	Premier of the Soviet Union, Georgy Malenkov, announces that the United States of America no longer controls a monopoly over the hydrogen bomb.	American hegemony over nuclear weapons officially ends today.
February 13th, 1960	France tests its first nuclear weapon.	The threat of nuclear warfare expands further.
October 13th, 1961	The USSR tests the Tsar Bomba, the world's largest nuclear weapon.	Leads to the Western allies increasing spending over the arms race.
October 16th, 1962	The Cuban Missile Crisis, the world's closest event to nuclear war occurs, when the USSR deploys nuclear weapons to the island of Cuba.	This leads to the United States and Soviet Union to establish the Moscow-Washington hotline between the two states to mediate discussions, however, leads to much more arms race spending.
October 10th, 1963	President Kennedy of the United States and Premier Khruschev of the Soviet Union, sign the "Limited Test Ban Treaty" looking to ban all nuclear tests above ground.	This leads to the first steps towards nuclear peace across the world.

October 16th, 1964	China tests it's first atomic bomb.	The threat of nuclear war expands further.

July 1st, 1968	The Nuclear Non-Proliferation Treaty is open for signing.	Drastically increases the steps taken for nuclear peace.
May 18th, 1974	India officially tests it's first nuclear bomb.	The threat of nuclear war expands further.
March 28, 1979	A nuclear reactor meltdown occurs in Three Mile Island, United States. The meltdown leads to small amounts of radioactive gasses being released.	Leads for the world to view nuclear energy in general, with more suspicion.

March 11, 1983	Pakistan begins testing for their nuclear weapons.	The threat of nuclear war expands further.
April 26, 1986	A nuclear reactor meltdown occurs in the Chernobyl Nuclear Power Plant in Ukraine, which was under the direct jurisdiction of the central authorities of the Soviet Union.	Leads for the world to view nuclear energy in general, with more suspicion.
October 5, 1986	The London Sunday Times publishes photos provided by	The threat of nuclear war expands further.

	defected Dimona worker Mordechai Vanunu revealing the Israeli nuclear program.	
March 11, 2011	Fukushima Daiichi nuclear-power plant accident occurs after a severe earthquake off the coast of Japan.	Leads for the world to view nuclear energy in general, with more suspicion.

Previous Attempts to solve the Issue

NPT - Nonproliferation Treaty

The Nonproliferation Treaty, or the NPT is a treaty intended on preventing the spread of nuclear weapons, which has been signed by roughly 191 parties. The nonproliferation treaty came into existence after into effect during the height of the Cold War, in the late 60s, and early 70s. The treaty has two main pillars that it abides by, which is non-proliferation of nuclear weapons and disarmament of the nuclear arms race. The treaty managed to pave the way for many future agreements, particularly joint agreements between the Soviet Union and the United States, such as the SALT (Strategic Arms Limitation Talks) Treaty and conferences held in Helsinki. However, the main problem within the non-proliferation treaty is that the world's largest nuclear powers such as India,Pakistan, North Korea or Israel have chosen not to sign the treaty due to unfavorable conditions towards their nations. The NPT also does nothing to address the possibility of terrorists and other non-state actors gaining possession of nuclear assets.

JCPOA - Joint Comprehensive Plan of Action

The Joint Comprehensive Plan of Action, or JCPOA, otherwise known as the "Iran Nuclear Deal" is a signed agreement between the United States, People's Republic of China, Russian Federation, European Union, France, Germany and Islamic Republic of Iran. The JCOPA is intended for the Islamic Republic of Iran to halt the Iranian

nuclear weapons program, in return for Western nations such as the United States or the United Kingdom to halt economic sanctions against Iran. The JCOPA is intended to maintain peace with Iran, and essentially delay their nuclear program from taking root. However, the main issue with the JCPOa is the fact that the United States, the main submitter for the JCPOA, has withdrawn from the Plan, effectively losing most legitimacy the treaty had managed to gain. Furthermore, the United States had also intensified tensions with the JCPOA by the murder of General Qassam Soleimani. President Biden however, has mentioned his intention on re-signing the agreement. To give credit where credit is due, the agreement managed to push back Iran's nuclear development further back, until 2020, and remained one of the most comprehensive nuclear deals ever signed.

Budapest Memorandum

The Budapest Memorandum was a set of accords signed between Russia, Belarus, the United Kingdom, the United States, Ukraine and Kazakhstan once the Soviet Union had dissolved. Upon its dissolution, the Soviet Union had left nukes all over the Ukrainian, Kazakh and Belorussian SSRs. As such, Russia wanted these nuclear weapons back, and the West wasn't keen on an expansion of nuclear weapons, therefore resulting in the signing of the "Budapest Memorandum". At its core, the Budapest Memorandum was meant to give guarantees of protection to all these nations by the United Kingdom, United States and Russia, in return for the surrender of their nuclear weapons to the Russian Federation. The agreement, while achieving this, did not have any clauses in the case of treaty violation by states (e.g the Russian invasion of Ukraine). The Memorandum, however, did manage to seize these nuclear weapons back, which limited the external proliferation of nuclear weapons.

Possible Solutions

Universal adoption of the "No First Use" Policy

A universal adoption of the "No First Use" Policy, would see a severe de-escalation of nuclear tensions across the world. The No First Use Policy entails that countries will not use nuclear weapons, if not attacked with such first. The adoption of a "No First Use" Policy will help to prevent non-nuclear conventional warfare from evolving into

full scale nuclear annihilation. At the present, only two nations have adopted a "No First Use" Policy, this being the People's Republic of China and the Republic of India. The problems with a no first use policy, is that with no external force backing such a policy, countries will not be obliged to follow such, and will be more likely to violate a "No First Use" Policy if it is universally adopted. As such, the United Nations or other external states must hold countries responsible through methods such as warnings when the instance of No First Use is close to being violated (e.g Russia's nuclear buildup near Ukraine).

Ending Sole Authority

Sole Authority refers to the singular authority that is held between the Heads of State or Heads of Government to launch nuclear weapons. At the present, the United States, People's Republic of China and the Democratic People's Republic of Korea are the only nations to still have sole authority. The problem with sole authority is that it doesn't keep Heads of State in check, and leads to nuclear tensions. This was evident throughout the cold war, in particular between the Soviet Union and the United States. In modern times, President Trump had frequently flirted with the idea of using nuclear weapons on the Democratic People's Republic of Korea. Vice Versa, Kim Jong-Un has also usurped the idea of using nuclear weapons on the United States, Republic of Korea and Japan. China has also frequently put forward the idea of using nuclear weapons against the Republic of China (Taiwan). In short, countries must universally pledge to end sole authority, and see a United Nations mandate over nuclear weapons, have external opposition parties to keep the nukes in check, or pass approval through other members of government before firing a nuclear weapon.

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