BLGMUN'25

IAEA

21-22-23
FEBRUARY

1-Letters

a.From Secretary General

Dear Delegates,

It is my greatest pleasure to welcome you all to BLGMUN'25, the first official MUN at our school. My name is Serra Yırtıcı and i'm the Secretary General of the BLGMUN'25. I'm an 11'th grader at Özel Artı Fen Bilgi Highschools.

As someone who loves special committies, i got absolutely more and more thrilled about our IAEA Committie while writing this study guide.

I'm looking forward to hear about all of your remarkable negotiations and creative solutions in the committie. I have no doubt that you will enjoy your time in and out of sessions with our excellent Chairboard and organisation team as everyone has been working with great afford.

I wish you all the best.

Sincierly

Serra Yırtıcı

b.From Under Secretary General

Dear Esteemed Delegates,

I welcome each and every individual to our committee IAEA at BLGMUN25`.This is Öykü Ela Yenigün. I am going to be your USG in this great conference.

As a brief introduction to our committe: The International Atomic Energy Agency (IAEA) is an international organization that promotes the peaceful use of nuclear energy, ensures nuclear safety, and prevents the spread of nuclear weapons. As the members of IAEA committee we will be going back in 1986 and we will be focusing on the nuclear power plant at Chernobyl-currently in Ukraine-going out of control during a test and causing explosion, fire which demolished the reactor building alongside effecting Belarus, Russia and Ukraine, as well as in many other European countries.

You will be discussing what to do in order to minimize\reduce the effects and making plans on how to prevent these situations from happening in the future. Having various experience throughout several MUNs, I expect the best from our committee as in finding informations related to our topic, voicing your statements and being able to defend your country accordingly to its policies.

Again, I look forward to seeing everybody in BLGMUN'25.

Sincerely,

Öykü Ela Yenigün

2-Introduction to the Committee

a. History of United Nations

The United Nations was founded after the Second World War with the aim of preventing future world wars therefore the League of Nations was achieved, however it was described as ineffective. On April 25, 1945, 50 nations met in San Francisco, California, for a conference and began drafting the United Nations Charter, which was adopted on June 25, 1945.

The Charter came into force on October 24, 1945, when the United Nations began its work. The objectives of the United Nations as defined in the Charter include the maintenance of international peace and security, the protection of human rights, the provision of humanitarian aid, the promotion of sustainable development and the observance of international law.

The United Nations had 51 member states when it was founded; by 2025 there will be 193 – almost all of the world's sovereign states. During the Cold War (1945-1991) the United Nations had played an significant part in helping countries reach peace an provide stable diplomacy, after the war the United Nations did not stop working on solving humanitarian crises and developing a sustainable environment. The United Nations is actively supporting and promoting human rights (which was adopted in 1948) and development goals (2015-) in the world.

United Nations mainly focus on:

1. Achieving international co-operation on solving international economic, social, cultural or humanitarian issues while promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language, or religion.

2. Maintaining international peace and security by preventing or removing of the threats of peace, as well as to peacefully resolve international disputes or potential conflicts according to the principles of justice and international law

3.Being a center for harmonizing the actions of nations in the attainment of these common ends.

4. Developing friendly relations among nations with respect for the principle of equal rights and self-determination of people and to take other appropriate measures to strengthen universal peace.

b. Intruduction to the General Assembly

The United Nations currently has six principal organs;

The General Assembly is the UN's most democratic body, since it includes all member states. Great powers often belittle the Assembly and call it irrelevant, but its work better reflects the will of the world's peoples than does the oligarchic Security Council. Reformers have long proposed steps towards a stronger and more effective GA.

The strength of the UN General Assembly is its unique capability to bring together representatives of the world's countries. Hereby, it creates a platform through which ideally countries can share their problems with the rest of the world, so that a common solution can be found to these problems.

The General Assembly is a symbol of international solidarity. At the same time, the way in which the General Assembly is organized, is a risk to its own functioning. Given the amount of potential topics that the General Assembly deals with and given that representatives from no less than 193 countries meet at the same time in the General Assembly Hall every year to discuss and debate, one can imagine that there can be great difficulty to get to any relevant discussions or decisions. The body itself has expressed that an effort should be made to make the General Assembly more focused and relevant.

The creation of the General Assembly (1945) included the establishment of six main committees;

First Committee (Disarmament & International Security)

Second Committee (Economic & Financial)

Third Committee (Social, Humanitarian & Cultural)

Fourth Committee (Special Political & Decolonization)

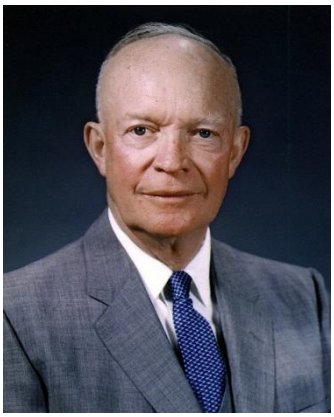
Fifth Committee (Administrative & Budgetary)

Sixth Committee (Legal)

c. Introduction to the IAEA

IAEA was established in 1957 as an autonomous organization within the United Nations system; though governed by its own founding treaty, the organization reports to both the General Assembly and the Security Council of the United Nations, and is headquartered at the UN Office at Vienna, Austria.

The IAEA was created in response to growing international concern towards the discoveries and diverse uses of nuclear technology, especially amid rising tensions between the foremost nuclear powers, the United States and the Soviet Union.



Its foundation was inspired by U.S. President Dwight D. Eisenhower's visionary 'Atoms for Peace' address, delivered to the United Nations General Assembly on December 8, 1953. In this groundbreaking speech, Eisenhower called for the creation of an international organization dedicated to ensuring the peaceful use of nuclear energy while preventing its misuse for destructive purposes.

Eisenhower's vision materialized with the drafting of the IAEA Statute, which was approved by 81 nations in October 1956. (*In this text, "statute" refers to an official document that regulates the establishment and functioning of an organization, particularly an international one.)* The statute emphasized the Agency's dual mission: to promote and control the use of nuclear energy. Article II of the Statute outlined the IAEA's objectives:

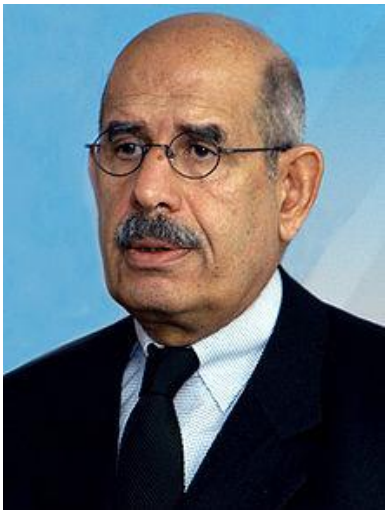
> *"The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."*

The U.S. Ratification of the Statute by President Eisenhower, 29 July 1957, marks the official establish of the International Atomic Energy Agency. During a press conference following the signing ceremony in the Rose Garden of the White House, Eisenhower reflected on his 1953 speech, stating:

> *"In fact, we did no more than crystallize a hope that was developing in many minds in many places ... the splitting of the atom may lead to the unifying of the entire divided world."*

In October 1957, at its First General Conference, delegates decided to locate the IAEA's headquarters in Vienna, Austria. Until the opening of the Vienna International Centre in August 1979, the Agency operated out of the old Grand Hotel, situated next to the Vienna Opera House.

Beginning in 1986, in response to the nuclear reactor explosion and disaster near Chernobyl, Ukraine, the IAEA increased its efforts in the field of nuclear safety.The same happened after the 2011 Fukushima disaster in Fukushima, Japan.



Both the IAEA and its then Director General, Mohamed Mostafa ElBaradei, were awarded the Nobel Peace Prize in 2005. In his acceptance speech in Oslo, ElBaradei stated that only one percent of the money spent on developing new weapons would be enough to feed the entire world, and that, if we hope to escape self-destruction, then nuclear weapons should have no place in our collective conscience, and no role in our security.

The IAEA has two policymaking bodies. They are:

1) **General Conference**
2) **Board of Governors**

1)General Conference:

• It consists of all the member countries of the IAEA.

• It meets in a regular annual session.

2) Board of Governors:

• It consists only 35 members.

For the 2024-2025 period, the new composition of the 35-member IAEA Board will be as follows:

Algeria, Argentina, Armenia, Australia, Bangladesh, Belgium, Brazil, Burkina Faso, Canada, China, Colombia, Ecuador, Egypt, France, Georgia, Germany, Ghana, India, Indonesia, Italy, Japan, the Republic of Korea, Luxembourg, Morocco, the Kingdom of the Netherlands, Pakistan, Paraguay, the Russian Federation, South Africa, Spain, Thailand, Ukraine, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the Bolivarian Republic of Venezuela.

• The Board generally meets five times a year.

• It examines and makes recommendations to the IAEA's General Conference on the organisation's programme, financial statements and budget.

• The Board considers membership applications, approves safeguards agreements and the publication of the safety standards of the IAEA

Currently IAEA has 171 members with its headquarters in: Vienna, Geneva, Monaco, Seibersdorf, Trieste in Europe; New York City and Toronto in North America; and Tokyo in Asia.

On 3rd of December 2019 Rafael Grossi became the first Latin American to head the Agency with secured two-thirds of majority in the 35-member IAEA Board of Governers voting to elect the new Director General.

During the Russian invasion of Ukraine, Grossi visited Ukraine multiple times as part of the ongoing efforts to help prevent a nuclear accident during the war. He warned against any complacency towards the dangers that the Zaporizhzhia Nuclear Power Plant, Europe's largest nuclear power plant, was facing. The plant has come under fire multiple times during the war.

d. The Main Functions of IAEA

The IAEA is generally described as having three main missions:

1) Promoting science and technology for peaceful uses

IAEA 's primary functions, according to Article III of its statute, to encourage research and development, to secure or provide materials, services, equipment, and facilities for Member States, and to foster the exchange of scientific and technical information and training.

Among the IAEA's six departments, three are primarily focused on promoting the peaceful uses of nuclear energy:

1. The Department of Nuclear Energy:

This department provides advice and services to Member States on nuclear power and the nuclear fuel cycle.

2. The Department of Nuclear Sciences and Applications:

This department focuses on the use of non-power nuclear and isotope techniques to assist IAEA Member States in the areas of water, energy, health, biodiversity, and agriculture.

3. The Department of Technical Cooperation:

This department provides direct assistance to Member States through national, regional, and inter-regional projects. Its initiatives include training, expert missions, scientific exchanges, and the provision of equipment.

Overall, the IAEA supports the use of nuclear technology for beneficial purposes, including energy production, healthcare, agriculture, and environmental protection. It also provides technical cooperation to Member States to help them develop and apply these technologies effectively.

2) Safeguards and verification

the IAEA is authorized in Article III.A.5 of the Statute "to establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State's activities in the field of atomic energy."

The Department of Safeguards is responsible for carrying out this mission, through technical measures designed to verify the correctness and completeness of states' nuclear declarations.

Furthermore; The IAEA helps maintain and strengthen effective emergency preparedness and response capabilities on a national and international level.

Emergency Preparedness and Response (EPR) framework, which is based on the international legal instruments, develops safety standards, guidelines and technical tools; assists Member States in building the capacity for emergency response; and maintains the IAEA Incident and Emergency System to efficiently implement its role in response to nuclear or radiological incidents and emergencies, regardless of whether they arise from accident, negligence or deliberate act.

3) Nuclear safety

The IAEA classifies safety as one of its top three priorities. It spends 8.9 percent of its 352 million-euro ($469 million) regular budget in 2011 on making plants secure from accidents. Its resources are used on the other two priorities: technical co-operation and preventing nuclear weapons proliferation.

In June 2011, the IAEA chief said he had "broad support for his plan to strengthen international safety checks on nuclear power plants to help avoid any repeat of Japan's Fukushima crisis". Peer-reviewed safety checks on reactors worldwide, organized by the IAEA, have been proposed.

Moreover, The Agency is known for its efforts on enforcing safeguards through international legislatives and treaties to verify that nuclear materials are not used for military purposes.

4) In Addition:

By ensuring the peaceful usage of nuclear technologies, promoting nuclear power as a low-carbon energy source to combat climate change, addressing global challenges like health, energy, food security, and environmental protection;

the IAEA's goals align with the Sustainable Development Goals (SDGs) 2030.

e. Other UN bodies regarding atomic energy

UN General Assembly First Committee (Disarmament and International Security Committee, DISEC)

The Disarmament and International Security Committee (DISEC) is the First Committee of the United Nations General Assembly. The committee concerns itself with questions of international importance regarding the security and demilitarization throughout all countries and regions, along with ensuring that citizens across the globe remain protected.

Engaging in disscussions on nuclear non-proliferation intersects with DISEC's mandete of the prevention of arms races and the regulation of armaments. By fostering dialogue among all member states, DISEC seeks to reduce the threats posed by nuclear weapons and ensure global stability, aligning with preventing the misuse of nuclear technology.

United Nations Security Council (UNSC)

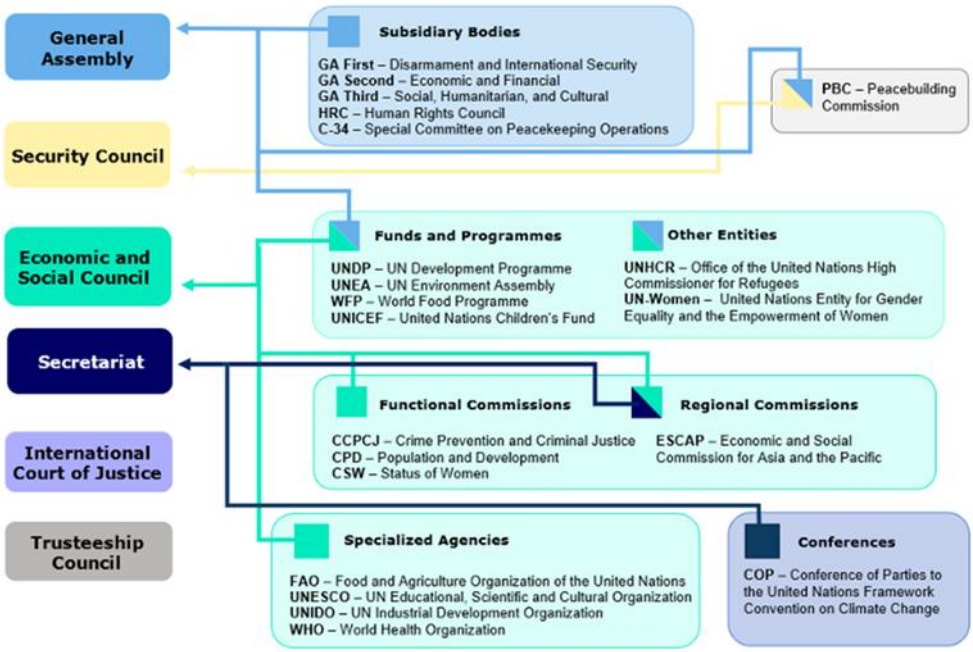
The United Nations Charter established six main organs of the United Nations, including the Security Council. It gives primary responsibility for maintaining international peace and security to the Security Council, which may meet whenever peace is threatened.

According to the Charter, the United Nations has four purposes:

- to maintain international peace and security;
- to develop friendly relations among nations;
- to cooperate in solving international problems and in promoting respect for human rights;
- and to be a centre for harmonizing the actions of nations.

All members of the United Nations agree to accept and carry out the decisions of the Security Council. While other organs of the United Nations make recommendations to member states,

only the Security Council has the power to make decisions that member states are then obligated to implement under the Charter.



The United Nations Security Council (UNSC) is not directly involved in the management of nuclear energy, but it has addressed the security implications of nuclear risks. Following Chernobyl, the UNSC works closely with agencies like the International Atomic Energy Agency (IAEA) to monitor nuclear activities and ensure that nuclear technology is used solely for peaceful purposes.

United Nations Environment Programme (UNEP)

The United Nations Environment Programme (UNEP) – established by Maurice Strong, its first director, after the United Nations Conference on the Human Environment in Stockholm in June 1972 – is the leading environmental authority in the United Nations system. UNEP uses its expertise to strengthen environmental standards and practices while also developing international environmental agreements; publishing and promoting environmental science and helping national governments achieve environmental targets.

Therefore; after the Chernobyl accident, UNEP has focused on assessing the long-term ecological damage caused by radioactive contamination, promoting sustainable land management, and supporting efforts to restore affected ecosystems.

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

The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) was set up by resolution of the United Nations General Assembly in 1955. Twenty-one states are designated to provide scientists to serve as members of the committee which holds formal meetings annually and submits a report to the General Assembly.

The organisation has no power to set radiation standards nor to make recommendations in regard to nuclear testing. It was established solely to "define precisely the present exposure of the population of the world to ionizing radiation". A small secretariat, located in Vienna and functionally linked to the United Nations Environment Programme (UNEP), organizes the annual sessions and manages the preparation of documents for the committee's scrutiny.

After the 1986 disaster, UNSCEAR conducted extensive research on the environmental and health impacts of radiation, including increased cancer risks and genetic effects. Its findings help shape international policies on radiation protection and nuclear safety, ensuring that future nuclear energy use is based on scientific evidence and minimizes risks to human health and the environment.

United Nations Office for Disaster Risk Reduction(UNDRR)

Created in December 1999, the United Nations Office for Disaster Risk Reduction (UNDRR) is the designated focal point in the United Nations system for the coordination of disaster risk reduction. Specifically, UNDRR guides, monitors, analyses and reports on progress in the implementation of projects concerning disaster risk reduction, supports regional and national implementation of, action and increases global awareness to reduce disaster risk working with U.N. Member States and a broad range of partners and stakeholders, including civil society, the private sector, parliamentarians and the science and technology community.

Addionally, UNDRR plays a crucial role in promoting global resilience to disasters, including nuclear accidents like the Chernobyl disaster. Following the 1986 event, UNDRR has worked to integrate nuclear risk reduction into disaster management frameworks, emphasizing preparedness, early warning systems, and long-term recovery.

World Health Organization (WHO)

The World Health Organization (WHO) was first proposed in 1945 as a public health agency to be formed as part of the United Nations. WHO’s constitution was ratified on April 7, 1948, marking its official establishment.

To support its three main missions, WHO engages in a variety of technical and practical functions related to disease prevention, emergency response, and direct care delivery.

Following the 1986 Chernobyl nuclear disaster, WHO collaborated with the IAEA and other organizations to assess radiation exposure and its long-term health effects, including cancer

risks and mental health issues. WHO continues to provide guidance on nuclear safety, emergency preparedness, and the mitigation of health risks associated with nuclear energy, ensuring global public health remains a priority in nuclear policies.

UN Economic and Social Council (ECOSOC)

The United Nations Economic and Social Council (ECOSOC) is one of six principal organs of the United Nations, responsible for coordinating the economic and social fields of the organization, specifically in regards to the fifteen specialized agencies, the eight functional commissions, and the five regional commissions under its jurisdiction. ECOSOC consists of 54 members, 18 of which are elected each year by the General Assembly for a three-year term.

During 1986 period; by coordinating with specialized agencies like the IAEA, WHO, and UNEP, ECOSOC helps develop policies and programs to promote sustainable nuclear energy use, economic recovery in affected regions, and long-term social resilience.

International Labour Organisation (ILO)

The ILO was created in 1919, as part of the Treaty of Versailles that ended World War I, to reflect the belief that universal and lasting peace can be accomplished only if it's based on social justice. In 1946, the ILO became a specialized agency of the United Nations. Its unique tripartite structure gives an equal voice to workers, employers and governments providing a unique platform for promoting decent work for all women and men. Today, the ILO helps advance the creation of decent work and the economic and working conditions that give working people and business people a stake in lasting peace, prosperity and progress.

After the Chernobyl accident, the ILO emphasized the need for strict safety standards for workers in nuclear facilities and those involved in disaster response. The organization develops guidelines and promotes international labor standards to ensure the protection of workers from radiation exposure and other hazards, contributing to safer working environments in the nuclear industry.

3-Introduction to the Agenda Item: International Cooperation in Addressing Post-Chernobyl Problems

Keywords

Nuclear energy: Nuclear energy is a form of energy released from the nucleus, the core of atoms, made up of protons and neutrons**.**

Atoms: Atoms are the basic particles of the chemical elements. An atom consists of a nucleus of protons and generally neutrons, surrounded by an electromagnetically bound swarm of electrons.

Electrical energy: Electrical energy is the energy derived from electric potential energy or kinetic energy of the charged particles.

Mechanical energy: In physical sciences, mechanical energy is the sum of potential energy and kinetic energy.

Kinetic energy: In physics, the kinetic energy of an object is the form of energy that it possesses due to its motion.

Potential Energy: In physics, potential energy is the energy held by an object because of its position relative to other objects, stresses within itself, its electric charge, or other factors.

Nuclear Power Plant (NPP): A nuclear power plant, is a thermal power station in which the heat source is a nuclear reactor.

Nuclear Reactor: A nuclear reactor is a device used to initiate and control a fission nuclear chain reaction.

Nuclear fission: Nuclear fission is a reaction where the nucleus of an atom splits into two or more smaller nuclei, while releasing energy.

Thermalization: In physics, thermalisation is the process of physical bodies reaching thermal equilibrium through mutual interaction. In general, the natural tendency of a system is towards a state of equipartition of energy.

TVEL: The TVEL Fuel Company is a *Rosatom*-owned nuclear fuel cycle company headquartered in Moscow. It has operated since 1996.

Graphite Reactor: A graphite-moderated reactor is a nuclear reactor that uses carbon as a neutron moderator, which allows natural uranium to be used as nuclear fuel.

a. Introduction

1.Overview of the Chernobyl Disaster

On April 26, 1986, Reactor No. 4 of the Chernobyl Nuclear Power Plant in Pripyat, Ukraine, erupted in a catastrophic failure, spewing deadly radiation into the air. Firefighters, plant workers, and first responders rushed in, unaware that they were walking into a death sentence. The city of Pripyat, once a symbol of Soviet progress, was evacuated in a matter of hours, leaving behind empty homes.

The Chernobyl disaster was not just a moment of devastation; it was the beginning of a tragedy that would unfold over decades.

b. Historical Context

The Chernobyl disaster had profound political and economic consequences for the Soviet Union. Before the incident, the USSR was already struggling with economic stagnation, inefficiency, and a growing burden of military expenditure due to the Cold War. The centralized economy was failing to meet the demands of modernization, and political dissatisfaction was rising.

The explosion at Reactor 4 on April 26, 1986, further exposed the weaknesses of the Soviet system, particularly its lack of transparency. The government's delayed response and attempts to cover up the disaster severely damaged its credibility, both domestically and internationally. Economically, the cleanup efforts and relocation of hundreds of thousands of people placed an immense strain on Soviet resources, costing an estimated 18 billion rubles.

The disaster also accelerated environmental and health crises, contributing to the declining public trust in the Soviet leadership. Politically, Chernobyl became a symbol of the failure of Soviet governance, strengthening reformist movements and fueling nationalist sentiments in various republics. Ultimately, it played a significant role in undermining the stability of the USSR, contributing to its eventual dissolution in 1991.

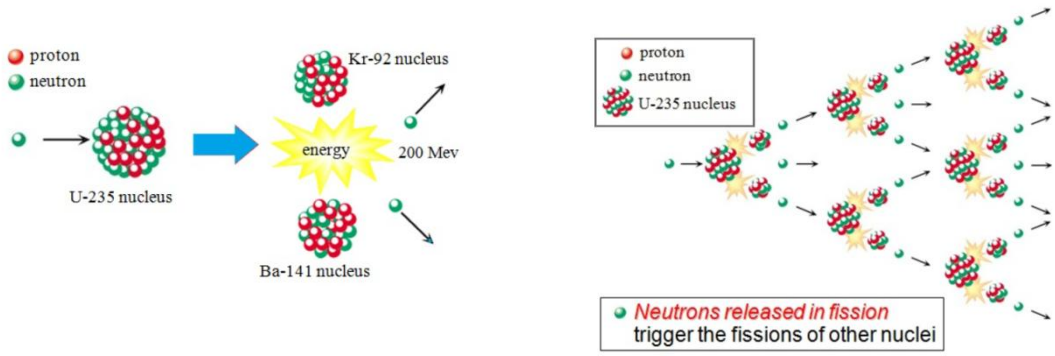
c. The Disaster: Timeline and Events

1c. The Working Principle of a Nuclear Reactor

The nucleus of Nuclear Power Plant (NPP) operation rests on a nuclear chain reaction. Within an NPP, energy undergoes a triple conversion process: initially, nuclear energy transforms into thermal energy; subsequently, thermal energy transitions into mechanical energy, culminating in the production of electrical energy.

This initial transformation from nuclear to thermal energy transpires within the reactor core, where substantial heat emerges through uranium fission. Typically, enriched uranium serves as the reactor fuel, housed within fuel rods organized into fuel assemblies. These assemblies collectively constitute the reactor core

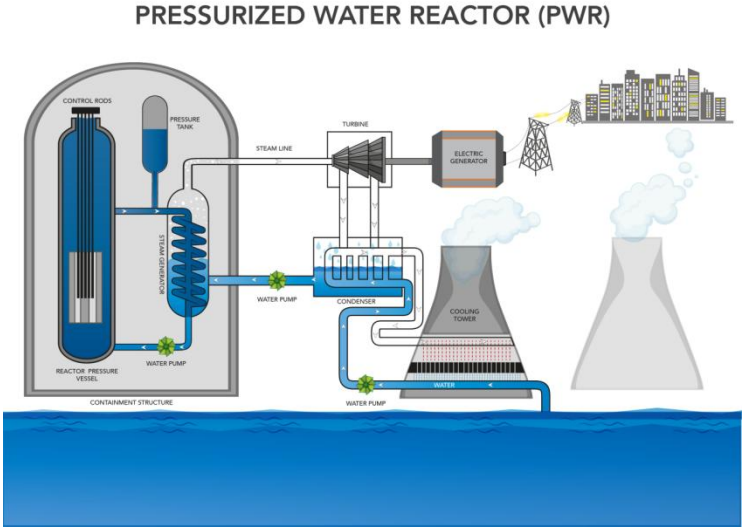
Uranium contained in TVELs is a radionuclide – an element with an unstable nucleus, thanks to this property it is capable of radioactive decay. As a result of decay, the nucleus splits into two fission fragments, releases energy and generates from 1 to 8 neutrons. At the same time, neutrons have a fairly high speed and, colliding with neighboring nuclei, provoke subsequent fissions, thanks to which the fission reaction occurs again, as a result of which there are more neutrons. If the particles that cause a nuclear reaction occur as products of this reaction, then this is a fission chain reaction.



The resulting fission fragments have a large kinetic energy, which, due to collision with atoms of other elements, is transformed into heat – the process of thermalization. This heat is transferred by the coolant, which is usually purified water, and is fed to the steam generator by the main circulation pumps. The primary circuit of the reactor coolant is a circuit together with the pressurizer system and the main circulation pumps designed to ensure the coolant circulation through the core in the operating modes and conditions established by the design. The coolant that comes into contact with the fuel assemblies becomes radioactive, so it is closed within the primary circuit and has no direct contact with the secondary circuit.

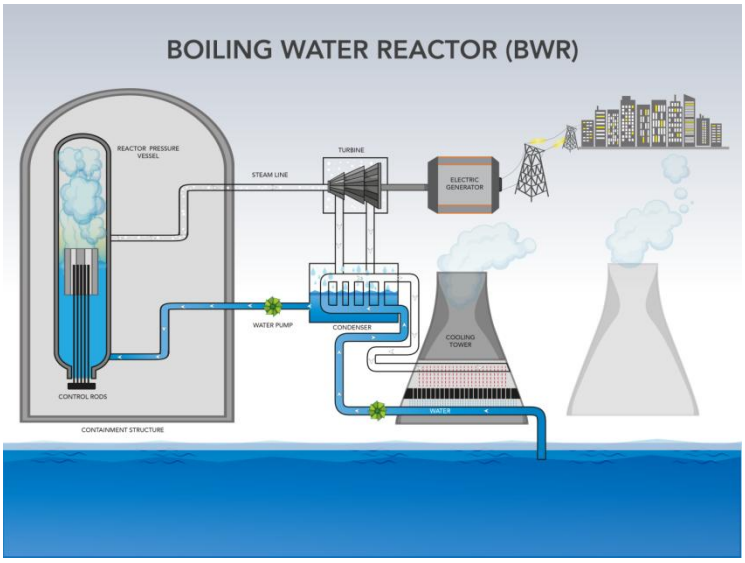
Water within the closed primary circuit of the system transmits its thermal energy to the secondary circuit coolant, which is ordinary purified water in the steam generator, causing it to reach boiling point. The cooled coolant returns to the reactor via the primary circulation pump thus closing the circuit. The steam generated in the steam generator travels through the secondary circuit piping, propelling the blades of the steam turbine. This process converts thermal energy into mechanical energy. Simultaneously, an electric generator, linked to the steam turbine, transforms this mechanical energy to produce electrical energy.

This illustrates the energy production process in the double-circuited nuclear power plants operating in Ukraine.



The water in the core is heated by nuclear fission and then pumped into tubes inside a heat exchanger. Those tubes heat a separate water source to create steam. The steam then turns an electric generator to produce electricity.

The core water cycles back to the reactor to be reheated and the process is repeated.



BWRs heat water and produce steam directly inside the reactor vessel. Water is pumped up through the reactor core and heated by fission. Pipes then feed the steam directly to a turbine to produce electricity.

The unused steam is then condensed back to water and reused in the heating process.

What fuels a reactor?

A number of different materials can be used to fuel a reactor, but most commonly uranium is used. Uranium is abundant, and can be found in many places around the world, including in the oceans. Other fuels, such as plutonium and thorium, can also be used.

Most of today's reactors contain several hundred fuel assemblies, each having thousands of small pellets of uranium fuel. A single pellet contains as much energy as there is in one tonne of coal. A typical reactor requires about 27 tonnes of fresh fuel each year. In contrast, a coal power station of a similar size would require more than two-and-a-half million tonnes of coal to produce as much electricity.

How about the waste?

Like all industries, the nuclear sector generates waste. However, unlike many others, nuclear power produces a minimal amount of waste and ensures its complete containment and management. In addition, the majority of waste generated by nuclear power plants exhibits low levels of radioactivity.

If nuclear power was used to supply a person's electricity needs for an entire year, only about 5 grams of highly-radioactive waste would be produced, which is the same weight as a sheet of paper.

The used fuel which comes out of the reactor can be managed in different ways, including recycling for energy production or direct disposal. As a matter of fact, many countries have been using recycled fuel for decades to partially fuel their reactors.

2c.The Explosion at Reactor No. 4

On April 25, 1986, routine maintenance was scheduled at V.I. Lenin Nuclear Power Station's fourth reactor, and workers planned to use the downtime to test whether the reactor could still be cooled if the plant lost power.

The station consisted of four reactors, each capable of producing 1,000 megawatts of electric power; it had come online in 1977–83.

Workers shut down the reactor's power-regulating system and its emergency safety systems, and they withdrew most of the control rods from its core while allowing the reactor to continue running at 7 percent power. These mistakes were compounded by others, and at 1:23 am on April 26 the chain reaction in the core went out of control. Despite attempts to shut down the reactor entirely, another power surge caused a chain reaction of explosions inside. Finally, the nuclear core itself was exposed, spewing radioactive material into the atmosphere. This and the ensuing fire in the graphite reactor core released large amounts of radioactive material into the atmosphere, where it was carried great distances by air currents. A partial meltdown of the core also occurred.

3c.Immediate Aftermath and Containment Efforts

Publicizing a nuclear accident was considered a significant political risk, but by then it was too late: The meltdown had already spread radiation as far as Sweden, where officials at another nuclear plant began to ask about what was happening in the USSR. After first denying any accident, the Soviets finally made a brief announcement on April 28.

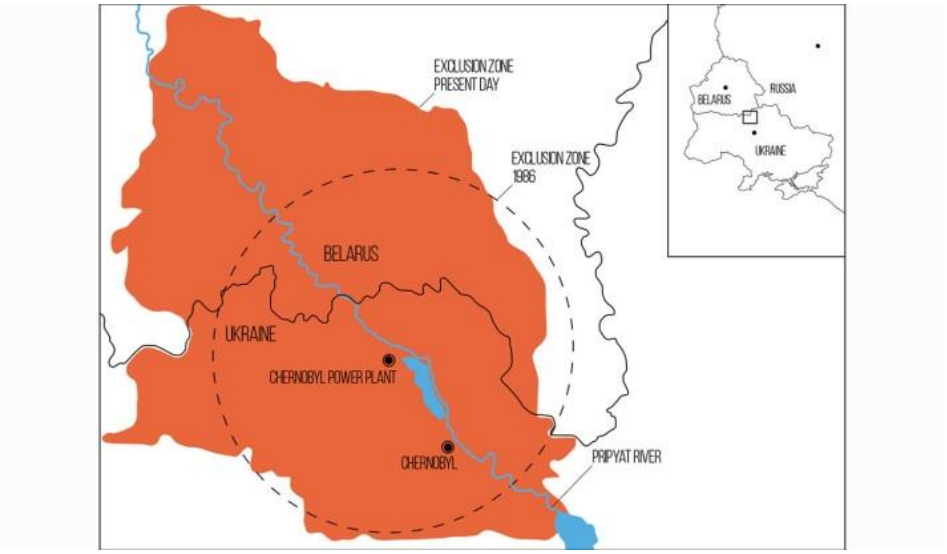
Firefighters attempted to put out a series of blazes at the plant, and eventually helicopters dumped sand and other materials in an attempt to squelch the fires and contain the contamination.

Soon, the world realized that it was witnessing a historic event.

Some sources state that two people were killed in the initial explosions, whereas others report that the figure was closer to 50. Dozens more people contracted serious radiation sickness; some of them later died. Between 50 and 185 million curies of radionuclides (radioactive forms of chemical elements) escaped into the atmosphere—several times more radioactivity than that created by the atomic bombs dropped on Hiroshima and Nagasaki, Japan.

The Chernobyl disaster sparked criticism of unsafe procedures and design flaws in Soviet reactors, and it heightened resistance to the building of more such plants. Chernobyl Unit 2 was shut down after a 1991 fire, and Unit 1 remained on-line until 1996. Chernobyl Unit 3 continued to operate until 2000, when the nuclear power station was officially decommissioned.

Following the disaster, the Soviet Union created a circle-shaped exclusion zone with a radius of about 18.6 miles (30 km) centred on the nuclear power plant. The exclusion zone covered an area of about 1,600 square miles (4,143 square km). With the dissolution of the Soviet Union in 1991, control of the site passed to Ukraine.



This area of Ukraine is described as Belarussian-type woodland with a low population density.

About 3 km away from the reactor, in the new city, Pripyat, there were 49,000 inhabitants.

The old town of Chernobyl, which had a population of 12,500, is about 15 km to the southeast of the complex. Within a 30 km radius of the power plant, the total population was between 115,000 and 135,000 at the time of the accident.

d. Environmental and Health Impacts

The United Nations Scientific Committee on the Effects of Atomic Radiation has reported that more than 6,000 children and adolescents developed thyroid cancer after being exposed to radiation from the incident.

In the immediate aftermath of the accident, an area of about four square miles became known as the “Red Forest” because so many trees turned reddish-brown and died after absorbing high levels of radiation. This radioactivity was spread by the wind over Belarus, Russia, and Ukraine and soon reached as far west as France and Italy. Millions of acres of forest and farmland were contaminated, and, although many thousands of people were evacuated, hundreds of thousands more remained in contaminated areas. In addition, in subsequent years many livestock were born deformed, and among humans several thousand radiation-induced illnesses and cancer deaths were expected in the long term.

e. International Response

1e.Role of the IAEA in Addressing the Crisis

Following the explosion at Reactor 4, the IAEA facilitated expert missions, verified radiation levels, and hosted the *1986 Vienna conference*, where Soviet officials presented their findings. It later launched the *International Chernobyl Project (1990–1991)* and the *Chernobyl Forum (2005)* to evaluate environmental and health impacts. In response to the disaster, the IAEA spearheaded the adoption of key safety conventions, such as the *Convention on Early Notification of a Nuclear Accident (1986)* and the Convention on *Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986)*, ensuring faster international cooperation.

Additionally, it contributed to long-term remediation efforts, including the construction of the *New Safe Confinement (NSC)* over Reactor 4 and the management of radioactive waste.

2e.Global Efforts to the Disaster

In the immediate aftermath, countries across Europe and beyond provided radiation monitoring, medical aid, and technical expertise to affected regions, with organizations like the WHO and IAEA playing key roles in assessing health and environmental impacts. The United Nations launched multiple initiatives, including the *Chernobyl Trust Fund (199*1) and the *Chernobyl Recovery and Development Programme (CRD*P), to support socio-economic recovery in Ukraine, Belarus, and Russia.

The Chernobyl disaster had other fallout: The economic and political toll hastened the end of the USSR and fueled a global anti-nuclear movement. The disaster has been estimated to cost some $235 billion in damages. Therefore:

The G7 nations, along with the European Union (EU), spearheaded financial contributions to the *Chernobyl Shelter Fund (1997)*, which funded the construction of the *New Safe Confinement (NSC)* over Reactor 4, completed in 2016 to prevent further radiation leaks.

3e.Changes in International Nuclear Regulations

IAEA convened a conference that led to the adoption of the Convention on Nuclear Safety—a treaty developed in the aftermath of the Chernobyl accident to promote the safety of nuclear power reactors around the world. IAEA administers the Convention.

Convention on Nuclear Safety

The convention was adopted in Vienna, Austria. The convention creates obligations on state parties to implement certain safety rules and standards at all civil facilities related to nuclear energy. These include issues of site selection; design and construction; operation and safety verification; and emergency preparedness. In 2010, countries told us that the Convention had indeed contributed to global nuclear safety.

Key articles from the convention:

Article 1

"The objectives of this Convention are to achieve and maintain a high level of nuclear safety worldwide, to establish and maintain effective defenses against potential radiological hazards, and to prevent accidents with radiological consequences."

Article 2

"Each Contracting Party shall take the appropriate steps to ensure that the facilities are sited, designed, constructed, and operated in a way that provides a high level of nuclear safety."

Article 5

"The regulatory body shall have adequate authority, competence, and financial and human resources to fulfill its assigned responsibilities and must function independently from other entities promoting nuclear energy."

Article 8

"Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations."

Article 11

"Each Contracting Party shall take the appropriate steps to ensure that sufficient numbers of qualified staff are available and that training programs are in place to maintain safety standards."

Article16

"Appropriate measures shall be taken to prepare for emergencies, including the development of emergency response plans and public information strategies."

Article 17

"Each Contracting Party shall take the appropriate steps to enhance international cooperation in nuclear safety matters and submit periodic national reports on implementation measures."

f. Current Status of Chernobyl

Today, the exclusion zone is eerily quiet, yet full of life:

There are 187 small communities in the exclusion zone that remain virtually abandoned to this day. A few inhabitants chose to return to their homes in the exclusion zone,

but children are not allowed to live in this area. The evacuated population lives mainly in newly constructed towns such as Slavutich in areas with very little or no contamination.

Though many trees have regrown, scientists have found evidence of elevated levels of cataracts and albinism, and lower rates of beneficial bacteria, among some wildlife species in the area in recent years. Yet, due to the exclusion of human activity around the shuttered power plant, the numbers of some wildlife, from lynxes to elk, have increased. In 2015, scientists estimated there were seven times more wolves in the exclusion zone than in nearby comparable reserves, thanks to humans' absence.

In 2011 the Ukrainian government opened parts of the exclusion zone to organized tour groups, and Chernobyl and the abandoned city of Pryp'yat became popular destinations for so-called "dark tourists."

Today, Chernobyl beckons to tourists who are intrigued by its history and its danger. But though Chernobyl symbolizes the potential devastation of nuclear power, Russia never quite moved beyond its legacy—or its technology. As of 2019, there are still 11 operational RBMK reactors in Russia.

During the Russian invasion of Ukraine, In 2022, Russian forces attacking from Belarus captured Chernobyl after a brief but pitched battle. Combat at the site of the world's worst nuclear disaster led to concerns about damage to the containment structure and the possibility of widespread radioactive contamination.

4- Questions to be concerned

• What were the key safety failures that led to the Chernobyl disaster?

• How can a more effective monitoring system be established to ensure the proper implementation of nuclear safety protocols?

• What actions can be taken to ensure the health of people and the enviroment short, mid and long term of the Chernobyl disaster by governments, committees and NGOs in the region?

• Should the IAEA be granted greater authority concerning these type of tragedies to enforce nuclear safety regulations?

• Should nuclear power plants be phased out, or should efforts focus on making them safer?

• How can international cooperation be strengthened to ensure rapid response and control mechanism to nuclear accidents?

• How can we ensure transparency in the process of publicizing developments at Chernobyl while managing public concerns and opposition to nuclear energy?

• What rights will employees working in the exclusion zone have regarding health problems that may arise due to radiation levels in the Chernobyl Aftermath?

• What strategies should states. goverments and international organizations pursue regarding the future of nuclear energy and adopt to mitigate the effects of nuclear accidents?

• How can the effects of radiation on the Black Sea be reduced in countries bordering the Black Sea and on marine life?

• How can the damage to the region's economy from aid to the affected people and the restoration of the region be minimized?

• How can the effects of radiation levels in the region on environment and animals be minimized?

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This is the reality of nuclear weapons: they may trigger a world war; a war which, unlike previous ones, destroys all of civilization.

Joseph Rotblat