ÇALMUN'25

ÇALMUN'25 CHERNOBYL CRISIS STUDY GUIDE

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1) Letter from the Secretary

Most Esteemed Participants

It is our utmost pleasure and enthusiasm to host you at the second edition of ÇemberlitaşMUN'25. As Secretaries-General, we are beyond honoured to witness this conference grow into a platform where diplomacy, intelligence, and collaboration flourish. The past few months have been filled with tireless efforts from our team, shaping what we are confident will be an experience you will never forget.

Our mission is to give a community that encourages active discussion, independent thinking, and innovative answers. With the rapidly changing world today, we believe that today's younger generation has the potential to drive changes. With every one of your speeches delivered, every resolution drafted, and every debate you conduct in this room, our youth deepen their knowledge of the world today.

ÇemberlitaşMUN'25 is not just about the debates—it is about the friends you will make, the skills and the perspective you will gain. We are thrilled to share this experience with all of you and await the energy, diligence, and leadership that will define this conference.

Beste Nur Filiz, Ayça Ayaz

2) Letter from Head of Crisis

Dear Esteemed Delegates,

With great enthusiasm, we welcome you to the third conference of our prestigious conference. We, Ahmet Eymen Ata and Kağan Aşık along with our honorable Under Secretary-Generals, worked all day to structure our committees. In the grand scheme of things, we ensured that everybody would enjoy their time in their related committees. Henceforth, enjoy!

Crisis committees operate in an environment of uncertainty, where real-time decision-making, strategic planning, and swift negotiation are critical. Our team went through blood and tears to make the time you will spend at our committees realistic, enjoyable, and make you feel like you are essentially at the moment of the crisis.

You will need to write detailed directives, please do not play with your fate with short directives. There will be dozens of factors in our committees, so a single consequence can lead to a disaster.

We hope our team's efforts result in your appreciation. If you ever have any questions, feel free to contact us through either the field or the conference's official Instagram account.

Sincerely,

Eymen and Kağan

3) Letter from the Under-Secretary General

Estimated Delegates,

It is my utmost pleasure to greet you at this annual session of ÇALMUN, which you are going to be highly delighted to attend. I am your Under-Secretary General, Elif Serra Solak. I hope that your experience regarding this conference and our committee will be much better than what you expected. We, as the academic team members who are responsible for this committee, worked really hard to present one of the best MUN experiences to you. We considered the best ways to create an outstanding environment for a crisis committee that necessitates science knowledge regarding various contents. With historical, political, cultural and scientific prospects of this committee, this study guide will be able to provide you what you need. The Chernobyl Nuclear Power Plant is one of the most popular disasters that caused devastating outcomes all around the world. By learning about the historical overview, the evolution of the energy race, vital identities that belong to specific nations, the diplomatic processes, health problems, short-term and long-term movements, neglect on certain matters by officials and the huge damage of the public workers, you are going to be prepared for the committee. The significant subjects are all involved in the study guide. I tried to give you diverse perceptions for a better understanding regarding the Chernobyl Disaster. It is highly essential for you to grasp the matter from every possible angle to take rapid and successful actions during the sessions. It is not merely learning about the facts, you have to be creative to come up with alternative solutions. Who knows, maybe you can be the saviors of many by taking the right actions. Is it possible to rewrite the story?

If you have any questions, do not hesitate to reach out:
elifserrasolak@gmail.com

Sincerely,
Under-Secretary General of the Chernobyl Crisis Committee
Elif Serra Solak

3) Introduction to the Committee

A) Soviet Union

The Russian Revolution was a period of time that embodied the Soviet Union until its fall in 1991. The social changes started in Russia in 1917 by far-left political groups and there were serious results regarding the ruling procedure of the country and the government. This revolution caused Russia to abolish its monarchy and adopt a socialist form of government following multiple successful revolutions and a civil war. The Russian Revolution was one of the key events in the 20th century that shaped the next generational complications and movements.

Outcome:

i) Establishment of Bolshevik Soviet republics around Russia, most of Ukraine, Belarus, Central Asia and the Southern Caucasus

ii) End of Russia's involvement in the World War I

iii) Dissolution of the Russian Empire

The most important parameter that is written above is that Ukraine was one of the socialist countries that accepted the revolutionary regime that would hold the world in a choke-hold.

There were outrageous crises all around the world that were caused because of multiple reasons and complications. When World War II finished in 1945, there were several new acts. Some nations were not happy about their situations, as the agreements hurt their countries' benefits from different prospects such as economical regression and suspending their military. That led the world to shape different competences rather than physical and painful movements. People were fed up with brutal war scenes and losing their loved ones to bullets. With the rise of the Soviets, a new era began that would start in 1947 and lasted until the dissolution of the Soviets : the Cold War.

There was a Soviet identity built on heroism and self-sacrifice. They were in a race with Western nations including the USA and Germany. Countries

were competing with each other to become the strongest and impose their ideologies and spread them. As in every race, the strongest one wins and rules the world. When we consider it politically, the nation with the strongest economy, military and technology wins the tournament without needing any combat in the battlefield. So, the Soviets were trying really hard to strengthen their identity and political power. One of the key factors to achieve that was getting involved in the energy race and inventing new technologies. As a result, the nuclear energy acts were given a green light.

B) Ukraine

The 20th century started new waves throughout Ukraine. After World War I, after the collapse of empires, the Ukrainian People's Republic (UPR) was proclaimed with Kyiv as its capital. The West Ukrainian People's Republic (WUPR) was also established in 1918, centered in Lviv, in the western territories. Both republics were intended to unite, forming the Unification Act on 22 January 1919. However their independence did not last long due to the Soviet oppressions and the contant military conflicts with Bolshevik forces. By 1921, after the Soviet-Ukrainian War, Ukrainian lands were divided and the eastern territories became a part of the USSR as the Ukrainian Soviet Socialist Republic, while western Ukraine was absorbed.

Consequently, Ukraine continued to be under the influence of the Soviets until 1991 and internalized their Soviet identity for over decades. That led Ukraine to take serious actions to strengthen and be in favor of building the Soviet Union as the leader/ruler of the world. Their government took actions based on socialist ideology and ruled their nation and their cities by pushing their citizens their beliefs. And connected to these actions and events, Ukraine took many steps for producing nuclear energy in their territories and being a part of the construction of nuclear reactors and facilities.

There were several locations and cities, such as Pripyat, that are crucial for our committee to understand the Chernobyl disaster better and fully grasp it.

C) Pripyat

Pripyat, also known as Prypiat, is now an abandoned industrial city in Kyiv Oblast, Ukraine, located near the border with Belarus. “Pripyat” name is coming from the nearby river and the main property was founded on 4 February 1970 as the ninth atom city. Atom city is a phrase that was used for closed cities in the Soviet Union that served the purpose of housing nuclear workers near a plant. The goal of Pripyat was to serve the nearby Chernobyl Nuclear Power Plant, which is located north of the abandoned city of Chernobyl. Pripyat was officially proclaimed as a city in 1979 with a population of 50,000 by the time it was evacuated on the afternoon of 27 April 1986, one day after the Chernobyl disaster.

The Soviets embraced RBMK reactor design which prioritized ease of local construction and economic value to aim for rapid and bigger growth. Many procedural detection mechanisms and safety concerns were sidelined in favor of production. To facilitate the construction and maintenance of the Chernobyl Power Plant, the Soviets founded the settlement of “Pripyat” to continue their nuclear construction journey. The Pripyat city became a symbol for reflecting governmental neglect regarding citizens and imposing the identity that grows around self-sacrifice.

D) Energy Race

Energy race is a vital field for nations to compete with each other because of numerous aspects. Energy is basically everything for countries, as the vast majority of governmental activities revolve around how much energy source and energy capability you have. When we dig into the subject and consider every detail, we come to the conclusion that having strong energy

sources takes you another place in the race and raises you up to the peak level.

After the Industrial Revolution, mass production became a part of our daily lives. It greatly decreased the cost of production and caused the products to be much cheaper and easier to use or access. Another view regarding the Industrial Revolution was that the need for energy increased rapidly. Countries got into another way of competence to reach a more economical way to produce energy. By the time, people discovered new and more effective ways for it. After the nuclear attacks on Japan by the US forces, people met with nuclear power and decided a new fate on energy production. Nuclear energy entered our lives and nothing stayed the same.

Additionally, social life is one of the areas that energy is needed. When we consider the amount of energy countries have to spend to keep daily life active, it would not have been a logical decision to reject growth in the nuclear energy field.

To summarize, it was discovered that nuclear energy was highly sufficient and cheaper compared to electricity or any other energy sources. As everyone can guess, the Soviets also got involved in improving their energy sources and accepted nuclear energy as one of their priorities. Around the 1960s, they began their studies and planned a long journey of how to construct and stabilize their nuclear energy technology. Even though it seems like an innocent act of a nation to aim for growth, the Soviet identity caused very dangerous risks and drove the world to a disaster that affected many countries. The sidelined precautions and overlooked security procedures made the nuclear energy integration process sloppy and risky. As a result, the Chernobyl disaster occured and left a stain in the history that cannot be forgotten for over decades. Other international effects of the disaster remained for years and pushed the world to overview every step of every nation to stop possible new disasters regarding nuclear energy studies.

E) Nuclear Energy

Nuclear energy caused numerous outrageous movements just by existing for over decades. Its historical effectiveness mostly depends on the tide of World War II, the period of time when the thermonuclear bomb (hydrogen bomb) was used and became one of the most controversial discoveries. That mark from history made a realization regarding the power of nuclear energy and nations put their nuclear energy processes as the prior matter for their physicians. People were afraid of it but not as afraid as being late to technological development races. As a result, it was clear that there must be strict security procedures, and no one was ready to take a risk that contained the possibility of explosions all around their countries.

There were several commissions and high-profile groups that were founded by bright scientists to discuss nuclear energy. Most of the European countries followed by Eastern nations were aware of each other and followed the global process in different angles. The ideas of the scientific commissions are common in most fields that consist of positive science and they share a common base. They share their experiments, their observations, their projects and the outcome of their projects to be aware of the danger, deter unethical studies and take precautions to decrease the possibility of dangerous incidents. In a nutshell, they have to recognize every detail to continue their own academic work in a safe zone. Even though it seems like a very good idea, the practical side of the process lacks commitment. As nations take competence very seriously, they take scientific developments seriously too. That is the reason why the Soviets were not intended to report their academic journey and did not want to reveal their strategies regarding nuclear energy to outshine their rivals. The Soviet identity and the effects of Cold War isolation were the main reasons that caused the Chernobyl disaster and left the world in a panic followed by health problems including cancer.

4) Key Terms/Events

A) The RBMK Design

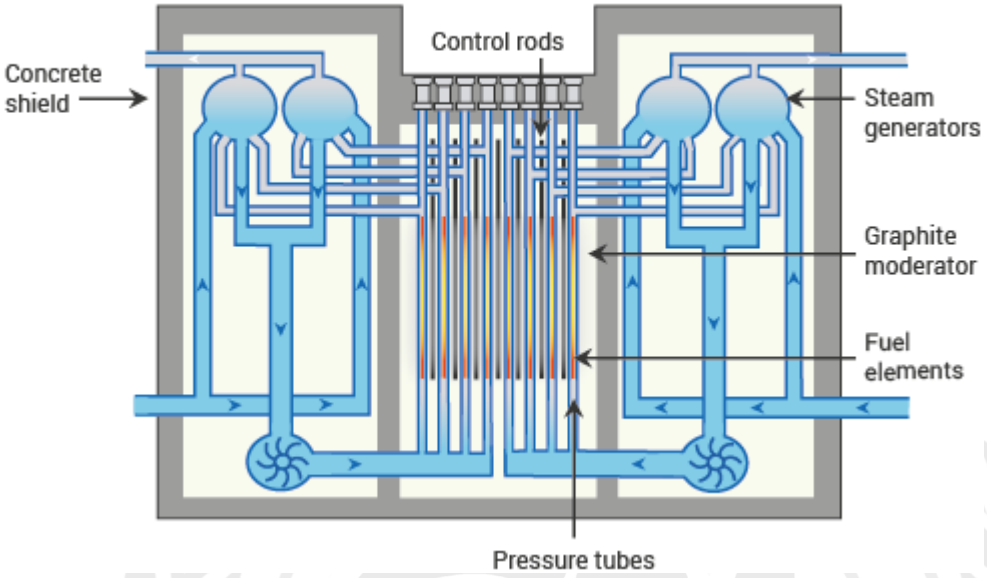
The Soviet-designed RBMK is a water-cooled reactor with individual fuel channels and using graphite as its moderator. It is also known as the light water graphite reactor (LWGR). As with a boiling water reactor (BWR), water boils in the fuel channels (at about 6.9 MPa) and steam is separated above them in a single circuit. It was designed over 1964-66 and is very different from most other power reactors. Its precursors were an experimental 30 MWt (5 MWe) LWGR at Obninsk which started up in 1954, and two small prototype LWGR (AMB-100 & 200) units – Beloyarsk 1&2, which ran from 1964 and 1968 respectively. (The ADE reactors at Zheleznogorsk and Seversk used for plutonium production are similar to the RBMK but with much lower power density and smaller fuel elements.)

The combination of graphite moderator and water coolant is found in no other power reactors in the world. As the Chernobyl disaster showed, several of the RBMK's design characteristics – in particular, the control rod design and a positive void coefficient – were unsafe. A number of significant design changes were made after the Chernobyl accident to address these problems.

The term 'positive void coefficient' is often associated with RBMK reactors.

Reactors cooled by boiling water will contain a certain amount of steam in the core. Because water is both a more efficient coolant and a more effective neutron absorber than steam, a change in the proportion of steam bubbles, or 'voids', in the coolant will result in a change in core reactivity. The ratio of these changes is termed the void coefficient of reactivity. When the void coefficient is negative, an increase in steam will lead to a decrease in reactivity.

A Light Water Graphite-moderated Reactor (LWGR/RBMK)

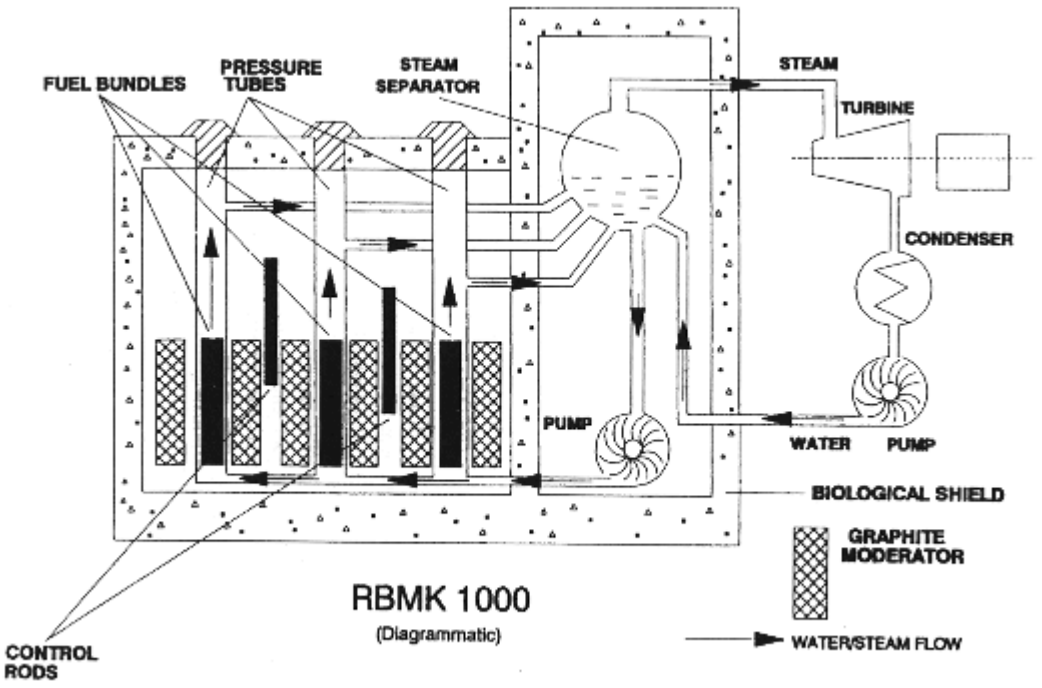


B) The Chernobyl Site and Plant

The Chernobyl Power Complex, lying about 130 km north of Kiev, Ukraine, and about 20 km south of the border with Belarus, consisted of four nuclear reactors of the RBMK-1000 design. The RBMK is an unusual design that the Soviets were working on throughout the 1970s. The design had shortcomings and was the design involved in the Chernobyl disaster. Units 1 and 2 were constructed between 1970 and 1977, while units 3 and 4 of the same design were completed in 1983. Two more RBMK reactors were under construction at the site at the time of the accident. To the southeast of the plant, an artificial lake of some 22 square kilometres, situated beside the river Pripyat, a tributary of the Dnieper, was constructed to provide cooling water for the reactors.

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.



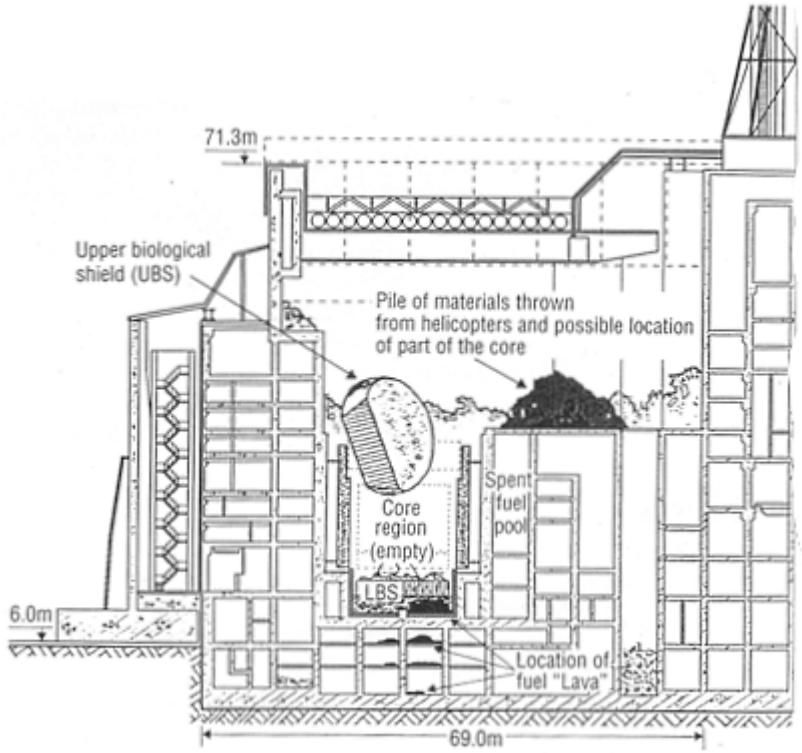
C) The 1986 Chernobyl Accident

On 25 April, prior to a routine shutdown, the reactor crew at Chernobyl 4 began preparing for a test to determine how long turbines would spin and supply power to the main circulating pumps following a loss of main electrical power supply. This test had been carried out at Chernobyl the previous year, but the power from the turbine ran down too rapidly, so new voltage regulator designs were to be tested.

A series of operator actions, including the disabling of automatic shutdown mechanisms, preceded the attempted test early on 26 April. By the time that the operator moved to shut down the reactor, the reactor was in an extremely unstable condition. A peculiarity of the design of the control rods caused a dramatic power surge as they were inserted into the reactor

The interaction of very hot fuel with the cooling water led to fuel fragmentation along with rapid steam production and an increase in pressure. The design characteristics of the reactor were such that substantial damage to even three or four fuel assemblies would – and did – result in the destruction of the reactor. The overpressure caused the 1000 t cover plate of the reactor to become partially detached, rupturing the fuel channels and jamming all the control rods, which by that time were only halfway down. Intense steam generation then spread throughout the whole core (fed by water dumped into the core due to the rupture of the emergency cooling circuit) causing a steam explosion and releasing fission products to the atmosphere. About two to three seconds later, a second explosion threw out fragments from the fuel channels and hot graphite. There is some dispute among experts about the character of this second explosion, but it is likely to have been caused by the production of hydrogen from zirconium-steam reactions.Two workers died as a result of these explosions and there were serious damages.

About 200-300 tonnes of water per hour was injected into the intact half of the reactor using the auxiliary feedwater pumps but this was stopped after half a day owing to the danger of it flowing into and flooding units 1 and 2. From the second to tenth day after the accident, some 5000 tonnes of boron, dolomite, sand, clay, and lead were dropped onto the burning core by helicopter in an effort to extinguish the blaze and limit the release of radioactive particles.



The damaged Chernobyl unit 4 reactor building

D) Timeline of the Detailed Actions on Friday, April 25th 1986

The Chernobyl power plant was in preparation for a safety test as a procedural process around 1 o'clock at night. Operators of the power plant began to reduce the power to test whether the plant could produce enough energy even if the power went out. Also, they planned to run tests that are focused on Reactor 4 to see whether it could still be cooled if power was lost.

By the early morning, the lowering of the reactor power was halted at 600 thermal megawatts. As a part of the procedure, operators turned off the reactor's emergency core cooling system to prevent interference with the test. However, the test had to be postponed due to a request from the electricity grid controller in Kiev. Controller asked for the power level to remain at 1600 thermal megawatts to meet the electricity demand. Due to this, the test was delayed until the night shift. Power reduction at the plant was recommended as the initial stages of the test began to be carried out.

By the midnight of April 26th, the more experienced day shift staff had swapped with the night shift workers. They received word that they would continue the safety test and shut down. As the clock passes midnight, power continues to drain from the reactor dropping to about 500 thermal megawatts. Either the operational failure or a malfunction in the regulating system caused the power level to drop unexpectedly. The power began to drop rapidly, landing at just 30 thermal megawatts.

Half an hour later, the power levels settled at 200 thermal megawatts. This made supervisors carry on with the test that was planned. In preparation, they began to shut down safety features, leaving the reactor vulnerable.

Nuclear reactors work like steam engines as their working mechanism explained above. In the reactor nuclear uranium rods react through fishing creating high levels of heat. This heat is used to convert water into steam which turns turbines to generate electricity. Control rods capable of absorbing neutrons are inserted between the uranium to slow down the reactions. Furthermore, cooling water şs also pumped around the core to prevent overheating. As a part of the test procedure, water flow to the core was increased and the additional pump quickly removed heat from the core. So, rods were removed to keep the electricity levels up. Calculations performed after the accident found that 8 control rods were used at this time while operating policy required a minimum 15 rods to be inserted in the reactor at all times.

As the reactor reading stabilized the shift supervisors considered the test preparations complete and ordered the emergency stop valves closed, the test was then initiated. Unexpectedly a sudden surge of power erupted in a panic. The operators initiated an emergency reactor shutdown by inserting control rods into the core. However, the control rods jammed as they entered. They were unable to control the chain reaction that followed.

The huge power build-up caused a massive steam explosion, destroying the reactor building and ripping the 1,000 ton roof off. A fireball

brightened the night sky as large amounts of radioactive material were suddenly expelled into the atmosphere. Following the explosion, a fire broke out in the reactor building and the graphite core. Unfortunately, many plant workers are assumed to be dead immediately.

The plant entered a blackout as the air filled with toxic particles and graphite junks. Despite all the evidence, the chief engineer insisted that the reactor remained intact and sent operators to examine the core. Those people were also quickly killed by the levels of radiation. The amount of radiation was 400 times higher than what was released by the Hiroshima and Nagasaki bombs in 1945.

E) Immediate Effect of the Chernobyl Disaster

The accident caused the largest uncontrolled radioactive release into the environment ever recorded for any civilian operation, and large quantities of radioactive substances were released into the air for about 10 days. This caused serious social and economic disruption for large populations in Belarus, Russia, and Ukraine. Two radionuclides, the short-lived iodine-131 and the long-lived caesium-137, were particularly significant for the radiation dose they delivered to members of the public.

It is estimated that all of the xenon gas, about half of the iodine and caesium, and at least 5% of the remaining radioactive material in the Chernobyl 4 reactor core (which had 192 tonnes of fuel) was released in the accident. Most of the released material was deposited close by as dust and debris, but the lighter material was carried by wind over Ukraine, Belarus, Russia, and to some extent over Scandinavia and Europe.

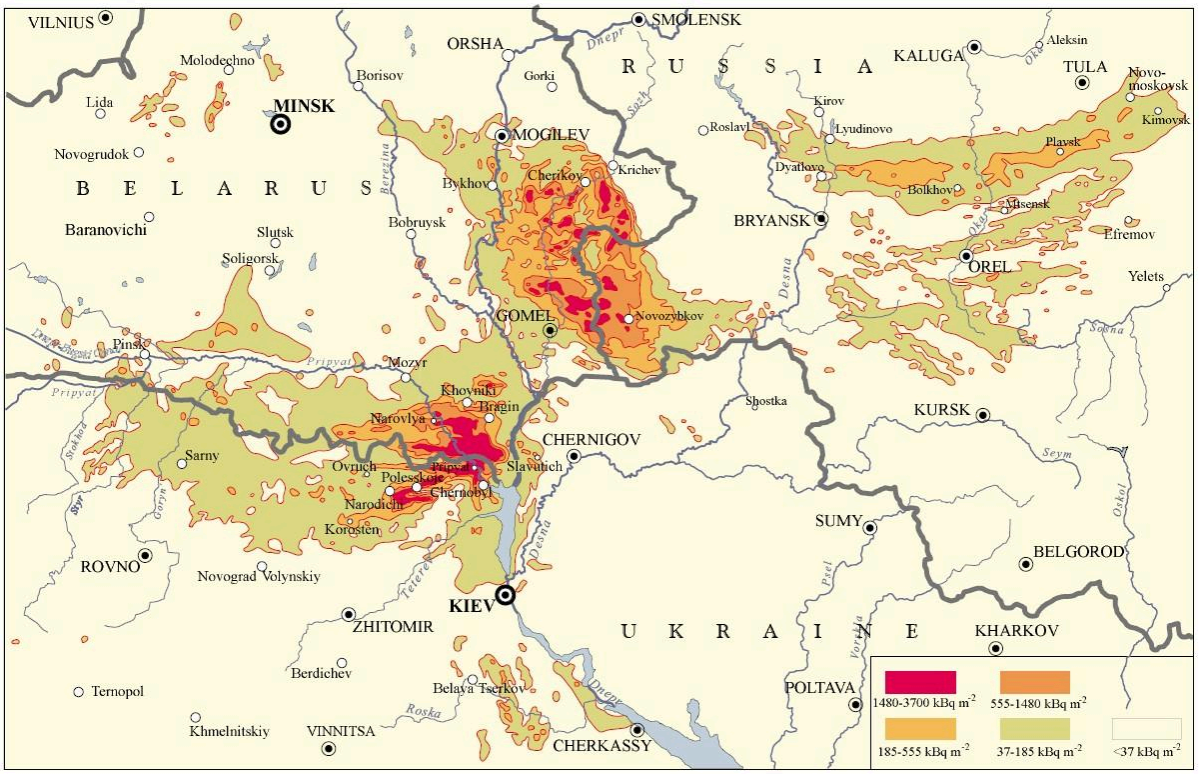


Figure VI. Surface ground deposition of caesium-137 released in the Chernobyl accident [I1, I3].

After the explosion, people were highly alarmed and worried.

26th April 1986, 1.28 am

The first group of firefighters arrived at the scene, they were unprotected and unaware of the radiation seeping into the atmosphere. They began pouring water on the fire, but obviously, nothing seemed to be putting it out. Soon, many firefighters began to vomit or lose consciousness.

New teams of firefighters arrived and everyone was shocked because of the graphite all over the sky. They were not trained regarding these types of accidents and did not know what to do. There was a scary and unusual heat and they did not understand the reason why. They were basically left there without anything and overlooked.

After an emergency meeting, local Soviet officials ordered the blocking of roads in Pripyat. Police officers lined through the streets and like the firefighters they were unprotected and unaware of the radiation.

Radiation is highly dangerous for both short-term and long-term health issues. The radiation damages the cells at the most fundamental level as it damages our DNA. DNA acute radiation sickness can occur shortly after exposure with symptoms such as vomiting, weakness and fever. Another common result of the radiation is cancer. Radiation transforms healthy cells into cancerous ones. The effects of radiation can also damage productive cells which can lead to genetic mutations in future generations.

Radiation doses on the first day of the disaster caused 28 deaths, 6 of which were firefighters who had put out the initial fire. Most died of acute radiation sickness in the weeks and months following the explosion.

Dawn broke, revealing the scope of the devastation, they were ashes everywhere. The fire at the core had continued.

5) Aftermath of the Chernobyl Disaster

A) Short-term Effects

April 27th 1986

To slow radioactive emissions, helicopters began to dump sand, clay, lead, boron and dolomite into the still burning core. It is estimated that around 600 pilots risked dangerous radiation levels to drop these materials.

Until 2.00 am, the residents of the nearby city of Pripyat had been told nothing about the accident by the Soviet Union officials, they continued their lives as usual. Finally, approximately 115,000 people were evacuated from Pripyat and nearby villages. People were told that the evacuation was temporary and they should only pack vital belongings.

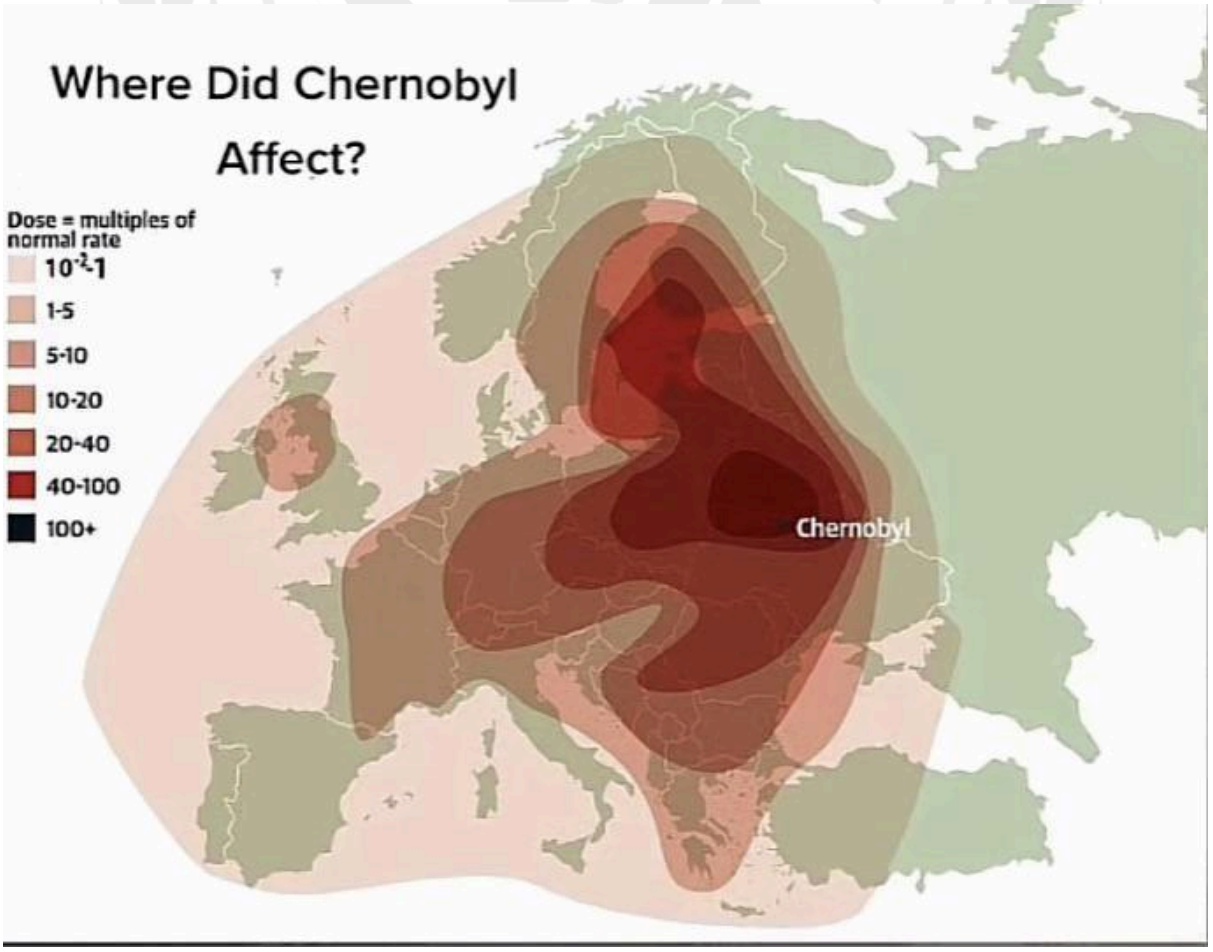
By the time, many residents were already complaining about headaches, vomiting and other illnesses that were caused by the radiation. Once the

city was evacuated, an exclusion zone was set up around the city and the Chernobyl area to prevent their return forever.

Millions of acres of forest and farmland were contaminated and although many people were evacuated, hundreds and thousands more remained. Also, the animals were highly contaminated and left there abandoned.

Special hunter organizations were found to hunt animals (cats, dogs etc) because of the fear that they would keep spreading the radiation. The main problem regarding the number of deaths was the Soviet Union being careless towards its citizens, they saw them as expendable objects. The citizens were sent into the fire, into the power plant without any kind of right equipment nor resources. They were not prepared at all.

Over 1,000 km from the Chernobyl plant



Air monitors at the Forsmark Nuclear power plant in Sweden register unusually high levels of radiation. The reading of the disaster led the Soviet Union to finally acknowledge the disaster after trying to suppress it. Even though the Soviets tried really hard to hide it, it was noticed abroad and people could see it. Other countries were angry towards the Soviet Union for not making any announcements regarding the accident, the damage. Although other countries wanted detailed information, they were rejected without any explanation.

Radio Moscow broadcasted at 8.00 pm that there had been an accident at the Chernobyl Nuclear Power Plant. About 30 minutes later, European News outlets began to report that there was an accident regarding the Chernobyl power plant. But falsely, the Soviet officials denied the fact that the disaster was monstrous and stated that it was under control.

April 29th 1986

The following day, satellite photos provided USA analysts with a picture of the Chernobyl area, revealing that the roof was blown off the Reactor with a glowing mass still smoking. Western nations were worried in case of a nuclear disaster coming from the Soviet Union.

a satellite photo

This picture was a solid proof for other nations that everything was really different in Chernobyl than they actually know.

April 30th 1986

Even though the Soviet television and mainstream channels showed several pictures from the Chernobyl Nuclear Power Plant, they still hid the actual mass destruction. Western nations, such as the USA, did not believe them because they also had proof.

May 1st 1986

Despite the destruction, the traditional International Workers' Day had been celebrated through the capitals in the Soviet Union. The officials did not attend the celebrations noticeably. Meanwhile, material thrown onto the burning Reactor core at the plant created a new impudent disaster. The materials raised the temperature causing scientists to worry that the core could melt into the reservoir below.

May 2nd 1986

Firefighters are tasked with pumping water out of the Subterranean Reservoir. The Liquidators of the accident are widely credited to limit the immediate and long-term damage, putting their lives on the line for the unwitting community.

Over 650,000 Liquidators helped in the clean-up in the first year. The total number is estimated to be over 1 million. Many of those who worked as liquidators became ill and according to some estimates about 8,000 to 10,000 died in the first year of the accident because of the radiation, many young men had been sacrificed.

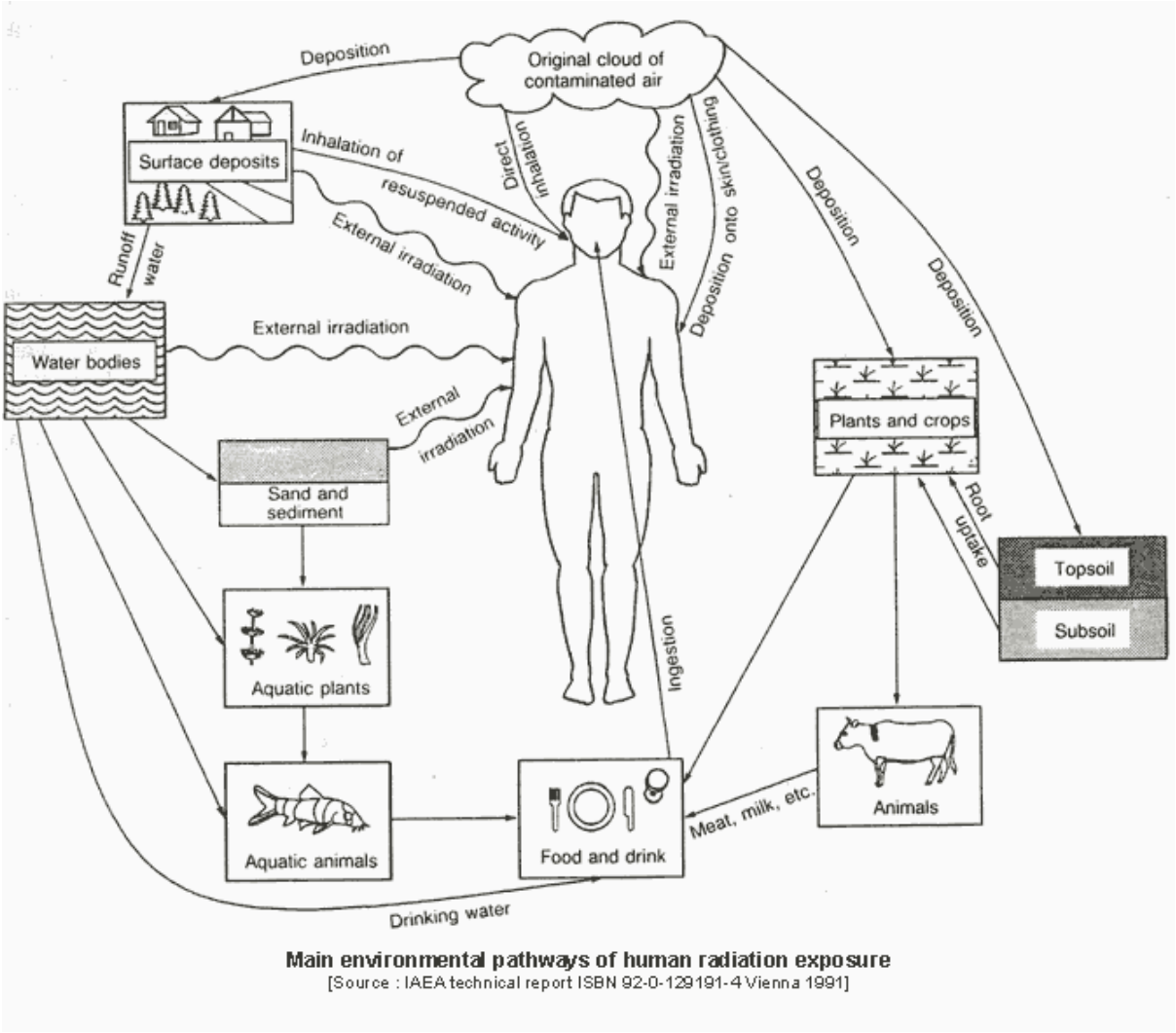
May 6th 1986

The first extensive report is published in the Russian broadsheet newspaper “Pravda”. 11 days after the initial explosion, Ukrainian citizens were warned against leafy vegetables and ordered to stay inside as much as possible. The delay of a detailed report caused many deaths that could have been prevented.

B) Long-term Effects of the Chernobyl Disaster

Several organizations have reported on the impacts of the Chernobyl accident, but all have had problems assessing the significance of their observations because of the lack of reliable public health information before 1986.

In 1989, the World Health Organization (WHO) first raised concerns that local medical scientists had incorrectly attributed various biological and health effects to radiation exposure. Following this, the Government of the Soviet Union requested the International Atomic Energy Agency (IAEA) to coordinate an international experts' assessment of accident's radiological, environmental and health consequences in selected towns of the most heavily contaminated areas in Belarus, Russia, and Ukraine. Between March 1990 and June 1991, a total of 50 field missions were conducted by 200 experts from 25 countries (including the Soviet Union), seven organizations, and 11 laboratories. In the absence of pre-1986 data, it compared a control population with those exposed to radiation. Significant health disorders were evident in both control and exposed groups, but, at that stage, none was radiation related.



Paths of radiation exposure

Since there was a humongous outrage and misleadings regarding radiation, people did not know what to do and what kind of measurements to consider. Some of them waited for the academic announcements from the officials and high-profile scientists, but the process took a while. The reason for the delay regarding an official radiation exposure explanation was that the assigned people for the job did not know anything more either. They needed time to figure out what was truly happening and what are the undeniable solid outcomes of the Chernobyl Disaster. The relationship between cancer, mutation and radiation had to be solved to ensure the prevention. So, detailed reports regarding long-term effects were published approximately 2 decades later.

The Chernobyl Forum report says that people in the area have suffered a paralysing fatalism due to myths and misperceptions about the threat of radiation, which has contributed to a culture of chronic dependency. Some "took on the role of invalids." Mental health coupled with smoking and alcohol abuse is a much greater problem than radiation, but worst of all at the time was the underlying level of health and nutrition. Apart from the initial 116,000, relocations of people were very traumatic and did little to reduce radiation exposure, which was low anyway. Psycho-social effects among those affected by the accident are similar to those arising from other major disasters such as earthquakes, floods, and fires.

The number of deaths resulting from the accident are covered most fully in the account of health effects provided by an annex to the UNSCEAR 2008 report, released in 2011. The report concluded: "In summary, the effects of the Chernobyl accident are many and varied. Early deterministic effects can be attributed to radiation with a high degree of certainty, while for other medical conditions, radiation almost certainly was not the cause. In between, there was a wide spectrum of conditions. It is necessary to evaluate carefully each specific condition and the surrounding circumstances before attributing a cause."

According to an UNSCEAR report in 2018, about 20,000 cases of thyroid cancer were diagnosed 1991-2015 in patients who were 18 and under at the time of the accident. The report states that a quarter of the cases (5000 cases) were "probably" due to high doses of radiation, and that this fraction was likely to have been higher in earlier years, and lower in later years. However, it also states that the uncertainty around the attributed fraction is very significant – at least 0.07 to 0.5 – and that the influence of annual screenings and active follow-up make comparisons with the general population problematic. Thyroid cancer is usually not fatal if diagnosed

and treated early; the report states that of the diagnoses made between 1991 and 2005, 15 proved to be fatal.

6) What should be answered/discussed to fully grasp the matter?

There have been various consequences of the Chernobyl Disaster from different angles, but the most important ones are listed below with a series of explanations. These parameters are still considered to be highly significant archives.

A) Political Effects

Political effects of the Chernobyl Disaster are very extensive. In the borders of the Soviet Union and Ukraine, there were several problems that had grown into bigger problems. Everything could have been highly different if the Soviet officials focused on other things rather than only thinking about their improvements on the nuclear energy field. Some violations regarding revealing the level of the danger were highly insufficient. The citizens of the Soviet Union did not know anything before 11 days until an official report finally laid out.

The most critical phases, the rapid actions that should be taken immediately after the accident were overlooked by the Soviet officials. The local people who live nearby, the citizens that consume the food coming from the nearby areas were not informed. They ate radioactive food, they drank contaminated milk/water , they lived with radioactive animals and got affected without knowing. The vast majority of locals had health issues both fatal and permanent due to the delay in the evacuation phase.

On the other hand, there are other suspicions regarding international associations that are handling nuclear failures and are constantly working on nuclear energy with experienced staff. As it is explained above, the Soviet officials rejected every will of other nations to reach detailed information about the Chernobyl accident. With a possibility, they could

have done alternative things with various options from different perspectives of the scientists. There were many scientists all around the world and maybe they could have come up with initiative solutions to simply break the chain impact of the Chernobyl Disaster.

There are questions in minds:

*If the Soviet officials informed the citizens earlier, would the number of deaths be less, or would there be another crisis that is bigger and harder to take under control?

*If the citizens were informed, would the evacuation process be damaged or otherwise, better?

*Would it be better crisis management if other nations were deeply informed?

B) Health Interventions

People were uneducated about the dangers of radiation for a long period of time. They lived without any qualified precaution to prevent health problems both for themselves and their own families. Many children and young people were sacrificed in many different ways. Some of them died in their mother's belly and some of them had to live disabled with permanent damages that could have not been repaired.

There were several cases of cancer, vomiting, weakness and other signs of radiation. It was obvious that there were people who were highly affected and should have been isolated to get treatments. Even though it was hard to predict the future and the long-term effects of the Chernobyl Disaster, many could have been alive if bare-minimum precautionary actions were taken.

There are questions in minds:

*What kind of actions could have been considered to save more lives?

*How could the actions have been more effective?

C) Public Workers

Since there were crucial effects of the Chernobyl Disaster physically on the streets, building, reactors etc., the Soviet officials had to assign their workers. There was an explosion and everywhere was everywhere because of the mess that the accident caused. There was an unbelievable fire and roads were also highly damaged. The Soviet officials were too worried to think everything through before taking a serious action regarding the matter. These neglectful behaviors of them brought many more problems by creating another perspective of the disaster.

The Soviet officials sent unprotected, uneducated and innocent firefighters to the scene at the Reactor 4, where the actual core fire was taking place. The Chernobyl Nuclear Power Plant was on fire and burning with every will it had to create ashes. When the firefighters arrived, they were not informed even a little bit about what was going on there and thought that it was a normal fire. The problem is, it was everything but normal. They were sent into a disaster that would be discussed worldwide for decades without any useful or necessary equipment. Many people died because of the deficiencies that the Soviet Union led to.

Unfortunately, other series of improbable actions were also taken by the Soviet officials. They also sent their police officers to close the roads without any information and basically sacrificed them throughout their duties. The police officers did not have any kind of sufficient equipment either. All of the people who were doing their job were purely innocent and were used by the authorities.

There are questions in minds:

*How would things turn out if the public workers were not sacrificed and did their job efficiently?

*How could the Soviet officials manage to provide adequate equipment for the workers?

*How could the workers save more lives?

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