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UNILATERAL NUCLEAR DISARMAMENT OF KAZAKHSTAN.

ANALYSIS AND PERSPECTIVES

ABSTRACT

After having renounced nuclear weapons and relinquished a Soviet-era stock pile of more than 1,400 warheads, in 1991, Kazakhstan demonstrated that international security does not lie in nuclear weapons, but in peaceful foreign policy and political and economic development. By showing the world an example of voluntary renunciation of nuclear weapons and full nuclear disarmament, Kazakhstan continue to actively participate in the global process of nonproliferation and building a world free from nuclear weapons. In the meantime, peaceful nuclear energy, implemented under the guidelines of the internationally recognized institutions, is strictly promoted by Kazakh authorities, as opportunity for national development.

Contents

INTRODUCTION

The year of 2013 marks the 22nd anniversary of the Semipalatinsk nuclear site's closure, which had been used for the execution of soviet nuclear tests until August 29, 1991. At that time, the President of the new Republic of Kazakhstan sanctioned the abolition by his country of the nuclear energy use in the construction of weapons, after the Soviet Union had conducted more than 450 nuclear tests with the cumulative power output equal to 2,500 Hiroshima bombs[1]. The effects on health caused by similar levels of radioactive exposure still affect hundreds of thousands of inhabitants of the Region, as well as the surrounding environment. With the closure of Semipalatinsk nuclear base, Kazakhstan became the first country of the world to voluntarily renounce to its nuclear arsenal[2].

Member of the Non-proliferation Treaty (NPT), the Comprehensive Test Ban Treaty (CTBT) and the START I – with Russia and the United States – today, Kazakhstan is one of the countries with a major commitment in raising awareness of the public opinion, in order to achieve a world free of nuclear weapons. In fact, Kazakh contribution to disarmament and non-proliferation started in 1994 in partnership with the United States, with the decision to dismantle the Russian nuclear arsenal still present on its territory: an event which involved the consequent alignment of Ukraine and Belarus to the Kazakh positions on the subject of nuclear power[3]. Again in partnership with the United States and in agreement with Russia and the experts of the International Atomic Energy Agency (IAEA), Kazakhstan has also been implementing new specific projects to down-blend highly enriched uranium and to ensure the safety of nuclear materials and facilities on its territory[4]. Moreover, in 2009, along with Kyrgyzstan, Uzbekistan and Turkmenistan, Kazakhstan created the first nuclear-weapon-free zone of the northern hemisphere with the entry into force of the Treaty of Semipalatinsk (March 21, 2009). During the same year, President Nazarbayev proposed to host permanently in Kazakhstan, the international nuclear fuel bank placed under the auspices of the

[1] Y. Kazykhanov, *Building a nuclear safe world: the Kazakhstan way,* in "Building a nuclear safe world: the Kazakhstan way", Committee for international information – Ministry of Foreign Affairs of the Republic of Kazakhstan, 2011, p. 6.
[2] In this regard, please note that before the Kazakh initiative, the first area free of nuclear weapons was created in Latin America, with the entry into force of the Treaty of Tlatelolco in 1968, and the same area was also established in South Pacific, with the entry into force of the Treaty of Rarotonga in 1982. For more information: A. Cicioni, *Le zone denuclearizzate in America Latina, Pacifico del Sud ed Asia Sud-orientale,* in "Nuclear News", Archivio Disarmo, January 2012 e A. Cicioni, *Il Trattato di Tlatelolco: la prima zona denuclearizzata,* p. 35-46, in M. Simoncelli (a/c): La pace possibile. Successi e fallimenti degli accordi internazionali sul disarmo e sul controllo degli armamenti, Roma, Ediesse, 2012, p.175.
[3] Y. Kazykhanov*, Building a nuclear safe world,* p. 7.
[4] *Ibid.*

IAEA. More recently, in November 2010, Kazakhstan completed a large-scale 12-month project to ensure long-term secure storage for more than 10 metric tones of highly enriched uranium and three metric tones of weapons-grade plutonium from the BN-350 reactor in Aktau – enough material to make about 800 nuclear weapons[5]. Nevertheless, with regard to the use of nuclear energy for civilian purposes, Kazakhstan does not have any active station with a generating capacity of nuclear power.

As part of its peaceful nuclear policy, Kazakhstan currently cooperates as well as with the IAEA and the States parties to the international treaties on nuclear power of which is itself a signatory, with the Nuclear Suppliers Group (NSG)[6], the Krakow Initiative[7], the Sanger Committee[8] and the Global Initiative to fight acts of nuclear terrorism. In order to prevent any illegal trade of nuclear material, Kazakh government also established the National Commission on Non-proliferation of WMD (Weapons of Mass Destruction), which has the task of monitoring the proper use of the material used in the nuclear cycle[9]. In addition, a new project was recently approved by the government: the ATOM international social campaign, which aims to create a global support on the issue of nuclear testing and the comprehensive ban of nuclear weapons.

In conclusion, the current nuclear disarmament policy of Kazakhstan is based on the principles expressed by President Nazarbayev in his message during the International Day Against Nuclear Tests – itself established on the initiative of Kazakh government – on May 29, 2011: *"a nuclear weapons-free world may become a reality only through united efforts of all countries and people, regardless of whether they possess nuclear technologies or not. Kazakhstan having voluntarily renounced to the world's fourth largest nuclear arsenal, has been and continues to be a reliable partner for the international community on issues of non-proliferation, disarmament and peaceful use of nuclear energy. Our policy remains balanced, predictable and responsible. Our country has a historical and moral right to act for the world's anti-nuclear movement"*[10].

[5] *Ibid.*
[6] Group of States owners of nuclear fuel, which also contribute to non-proliferation through the implementation of controls on exports of raw materials and nuclear-related products.
[7] Formally known as the Proliferation Security Initiative, it was promoted by the former U.S. President, George Bush, in 2003. Its main purpose is to limit and control the global traffic of weapons of mass destruction.
[8] Established for the study of genetic disorders.
[9] N. Nazarbayev, *Global Peace and nuclear security,* in "Building a nuclear safe world: the Kazakhstan way", Committee for international information – Ministry of Foreign Affairs of the Republic of Kazakhstan, 2011, p. 17.
[10] N. Nazarbayev, *For the sake of our children we have to act now*, in "Building a nuclear safe world: the Kazakhstan way", Committee for international information – Ministry of Foreign Affairs of the Republic of Kazakhstan, 2011, pp. 11 – 12.

Image 1: Map of Kazakhstan

Source: Republic of Kazakhstan at the International Day against nuclear tests, August 29, 2011

CHAPTER I

THE AGE OF NUCLEAR POWER

1. THE SOVIET NUCLEAR POLICY IN KAZAKHSTAN

The Soviet military nuclear project for the development of the atomic bomb started in 1943 as top secret research project, and continued over the next six years – until 1949, when, thanks to the success of the nuclear tests in Semipalatinsk (now Semey) in Kazakhstan, the Soviet Union became the second country, after the United States, to be able to detonate a nuclear device. The program for the development of nuclear power in the Soviet Union, which begun during and continued after World War II, in the wake of the discovery of the American (the Manhattan Project), British (the Tube Alloys Program) and Canadian (related to the Tube Alloys Program) nuclear projects, was directed by the Soviet nuclear physicist Igor Kurchatov, while the logistics and military intelligence efforts were undertaken and managed by the Director of the People's Commissariat for Internal Affairs, Lavrentiy Beria[11].

During World War II, the Soviet nuclear program was implemented under the support of Stalin, driven by the initiative of the physicist Georgy Flyorov, who asked the party to start research on nuclear energy, since it was long suspected that many of the allied powers were secretly working on a nuclear weapon (especially after the discovery of nuclear fission by the two German chemists Otto Hahn and Fritz Strassmann, in 1939)[12]. However, due to the intensification of the Soviet war efforts against Germany, it was impossible to implement the research, which resumed only after the U.S. atomic bombings of Hiroshima and Nagasaki.

Shortly after the war, the Soviet Union expanded the capacity of its research facilities and military reactors, and the number of scientists employed in the development of the atomic bomb. Thus it was that, after the end of World War II, the steppes of Kazakhstan became the theater of the testing of nuclear weapons by the Soviet Union. Several tests were also conducted in one of the

[11] For more information on the Soviet nuclear program, visit the following website: http://nuclearweaponarchive.org/Russia/Sovwpnprog.html
[12] *Ibid.*

most remote places on Earth, the archipelago of Novaya Zemlya in the Arctic Circle (it was estimated that approximately 130 of 715 soviet nuclear tests took place on these huge and secluded Arctic islands, in particular 88 in the atmosphere, 39 underground and 3 underwater[13]), as well as in the Urals, at the missile test launch area of Syr Darya and at the base of Semipalatinsk, both in Kazakhstan[14].

Thanks to the information obtained through Soviet Alsos (a secret operation which took place in early 1945 in Germany, Austria and Czechoslovakia, and whose objectives were related to the exploitation of German atomic research) and the Atomic Spy Ring (a network of secret agents and nuclear experts settled in the United States, Great Britain and Canada), the Soviet Union conducted its first test of implosion of a nuclear device, codenamed First Lightning (nicknamed Joe-1 by the Americans), on August 29, 1949, in the Soviet Socialist Republic of Kazakhstan, at the base of Semipalatinsk[15]. Subsequently, the first Soviet test of a thermonuclear bomb – RDS-6, took place on August 12, 1953 at the same facility. It used a layer-cake design of fission and fusion fuels (uranium 235 and lithium-6 deuteride) and produced a yield of 400 kilotons, mostly from neutron-initiated fission rather than fusion. Always at the same site, it was also tested the first Soviet hydrogen bomb, on November 22, 1955. Identified by the code RDS-37, the bomb was part of the multi-staged thermonuclear implosion type, known as Teller-Ulam in the United States and called "Third Idea" by Andrei Sakharov, a Russian nuclear physicist[16].

Once atmospheric tests were banned, in 1963, with the ratification of the Partial Tests Ban Treaty (PTBT), the Soviets transferred their experiments to underground bases, including the complex of Chagan, Murzhik and Degelen Mountain, in Kazakh territory, which is now riddled with boreholes and depressions of the ground[17]. In particular, the operational base of Chagan, part of the Semipalatinsk nuclear site, was initially projected to implement the program “Nuclear Explosions for the National Economy” or Project 7 – the Soviet equivalent of the US Operation

[13] For more information on Novaya Zemlya test sites, visit the following website: http://www.globalsecurity.org/wmd/world/russia/novaya_zemlya_nuc.htm. Novaya Zemlya was the site of the October 30, 1961 explosion of Tsar Bomb, the largest, most powerful nuclear weapon ever detonated – a power of about 100 megatons deliberately reduced shortly before the launch. Although it was never put into circulation as a weapon, its detonation test represented a demonstration of the ability of the soviet military technology. The explosion was of such magnitude that it caused third-degree burns on humans up to 100 km away. On this topic, also visit the following website: http://www.nuclearweaponarchive.org/Russia/TsarBomba.html

[14] For more information, visit the CTBTO Preparatory Commission website: http://www.ctbto.org/nuclear-testing/the-effects-of-nuclear-testing/the-soviet-unionsnuclear-testing-programme/

[15] Republic of Kazakhstan, *Kazakhstan and non-proliferation,* p. 4, august 29, 2011, International day against nuclear tests.

[16] R. Johnston, *RDS-37 nuclear test, 1955,* available at http://www.johnstonsarchive.net/nuclear/tests/1955USSR-1.html

[17] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 4.

Plowshare to investigate peaceful uses of nuclear weapons[18]. The first nuclear test in Chagan took place on January 15, 1965 and was an underground detonation of a nuclear device. The site was a dry bed of the Chagan River at the edge of the Semipalatinsk Test Site, and was chosen such that the lip of the crater would dam the river during its high spring flow. The resultant crater had a diameter of 408 meters and was 100 meters deep. A major lake (10,000 m^3) soon formed behind the 20–35 meters high upraised lip, known as Chagan Lake or Balapan Lake[19].

When the Soviet Union collapsed in December 1991, Kazakhstan de facto inherited the fourth nuclear arsenal of the world, after those of Russia, the United States and Ukraine. At that time, Kazakh arsenal included 104 intercontinental ballistic missiles of the type SS-18, 40 strategic bombers Tu-95M type, equipped with 390 cruise missiles, as well as a total of about 1,410 warheads[20]. In addition, as major problem for the international community, in Kazakh territory stood the former USSR nuclear test site of Semipalatinsk, which Soviet experts and officials were gradually abandoning. Economic conditions in the main city near the testing grounds grew desperate, and residents began to search the tunnels for metal to sell. They used mining equipment to steal copper from the electrical wiring and to scavenge rails that once carried nuclear devices far underground for explosive testing[21].

However, ties between Moscow and Astana (capital city of the new Republic of Kazakhstan) remained firm even after the attainment of the independence, both in terms of economic and strategic cooperation. Although the existence of a privileged relationship with Russia, Kazakhstan did not prevent the development of a dialogue with Western countries: from early Nineties, cooperation on security and non-proliferation has been a major area of partnership with the United States, which politically and economically supported the Kazakh government for the removal of nuclear warheads – completed in 1995 – as well as for the adhesion of the country to the major treaties on arms control and NATO[22].

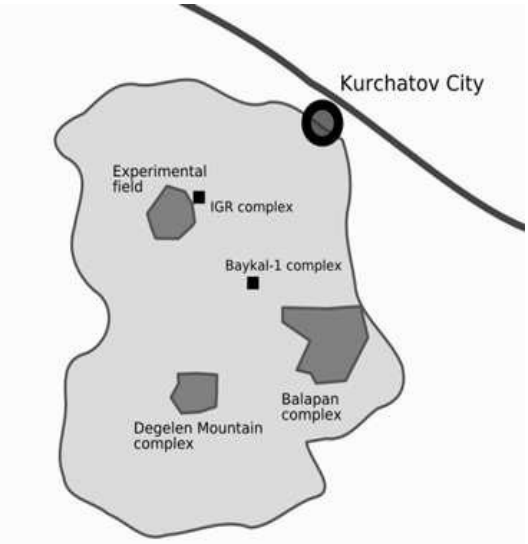
For these reasons, in 1990, the United States, through an agency in the Pentagon dealing with nuclear security, funded a program to close off the entrances to the tunnels at Semipalatinsk so

[18] US Department of Energy, *The soviet program for peaceful uses of Nuclear Energy,* available at: https://e-reports-ext.llnl.gov/pdf/238468.pdf
[19] For more information, visit the following website: http://nuclearweaponarchive.org/Russia/Sovwpnprog.html#Chagan
[20] P. Podvig, *Russian Strategic Nuclear Forces,* Massachusetts MIT Press, 2004, pp. 150 – 167.
[21] D. E. Hoffman, E. Harrell, *Kazakhstan: saving the world at plutonium mountain,* august 17, 2013, in "Pulitzer center on crisis reporting", available at http://pulitzercenter.org/reporting/washington-soviet-union-kazakhstan-los-alamos-laboratory-nuclear-plutonium-bomb-mine
[22] Treccani Atlante Geopolitico 2013, *Kazakhstan,* available at www.treccani.it

they could never again be used for nuclear tests. The tunnels were sealed at the portals but not explored to any depth. Plutonium from the earlier safety tests lay deep inside. Radi Ilkaev, former director of the nuclear secret city of Arzamas-16 – now renamed Sarov – and one of the two leaders of the Soviet-era nuclear weapons research said that although Russia never wanted to go back to Semipalatinsk, could not afford the environmental cleanup of the site[23]. Only on August 29, 1991, following the initiative of Kazakh President Nursultan Nazarbayev, the Semipalatinsk nuclear site was made non-operational and officially closed.

3. THE CASE OF SEMIPALATINSK

Image 2: Semipalatinsk nuclear site



Source: Republic of Kazakhstan at the International Day against nuclear tests, August 29, 2011

The Semipalatinsk Test Site (STS) was the primary testing venue for the Soviet Union's nuclear weapons. It is located on the steppe in northeast Kazakhstan, in the south of the valley of the Irtysh River. The scientific buildings for the test site were located around 150 km west of the town of Semipalatinsk, near the border of East Kazakhstan and Pavlodar provinces with most of the nuclear tests taking place at various sites further to the west and south, some as far as Karagandy

[23] D. E. Hoffman, E. Harrell, *Kazakhstan: saving the world at plutonium mountain.*

province[24]. The site was known by its postcode Semipalatinsk-21 or the Semipalatinsk Polygon. It was selected in 1947 by Lavrentiy Beria according to the false assumption that the steppes of that area (an extension of 18,000 km²) were completely uninhabited[25].

The testing field was presented as a large-scale engineering and constructional facility designed for registering of nuclear explosion parameters in natural experimental conditions. There is a ground in the center of the testing field, the Epicenter, where a number of tests had been carried out, including the first one[26]. Its nuclear charge power, converted into conventional explosives equivalent, was equal to 20 kilotons (equal to the Hiroshima bomb in power output)[27]. Nevertheless, the Semipalatinsk complex was of acute interest to foreign governments, particularly during the phase when explosions were carried out above ground at the experimental field: several U2 over-flights examined preparations and weapons effects, before being replaced with satellite reconnaissance.[28] With these systems, the Defense Intelligence Agency of the United States, during the implementation of Stargate – a project of clinical research on psychic activities – identified a smaller research station, located on the site of the Kazakh nuclear tests, known to the Department of Defense U.S. with the code name PNUTS (Possible Nuclear Underground Test Site), and to the CIA, as URDF -3 (Unidentified Research and Development Facility-3)[29].

As previously mentioned, the site was officially closed on August 29, 1991 when President Nazarbayev announced the effects of radiation exposure on the population and the environment surrounding the base (kept hidden for many years by the Soviet authorities). In addition, the results of scientific studies conducted at the base of Semipalatinsk after its closure revealed that the dispersion of radioactivity in the environment surrounding the site had a direct impact on the health of approximately 220,000 local residents[30]. In particular, scientists linked the high rate of cancer among the population of the region, to the effects of post-irradiation exposure. Similarly, several studies explored and confirmed the relationship between radiation exposure and thyroid abnormalities.

[24] Republic of Kazakhstan, *Kazakhstan and non-proliferation,* p. 3.
[25] *Ibid.,* p. 4.
[26] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 5.
[27] *Ibid.*
[28] *Ibid.,* p. 6.
[29] *Ibid.*
[30] T. Kassenova, *The lasting toll of Semipalatinsk's nuclear testing,* in "Bulletin of the Atomic Scientists", September 28, 2009.

However, the most important push to dismantle the Kazakh nuclear arsenal came from the first anti-nuclear non-governmental organization created on the territory of the former Soviet Union: the Nevada-Semipalatinsk Movement. This organization was promoted in 1989, thanks to the intensification of contacts among activists in the U.S. and Kazakhstan (hence the name, as recognition of the bond with the protests in the United States), and was made operational when 5,000 people attended to the meeting with the Kazakh poet Olzhas Suleymenov, at the Writers Union of Alma Ata. On that occasion, he publicly denounced the damage on human health and environmental impact of Soviet nuclear tests in Kazakhstan[31]. The movement's aim was to protect humanity from the nuclear threat, destroy all nuclear test facilities in Kazakhstan, establish public control of industrial wastes, and draw an ecological map of the region. During the years, the Nevada-Semipalatinsk movement has become a significant pressure group: in the United States, demonstrations at the Nevada Test Site involved thousands of people at a time and in Kazakhstan continue to spread the principles of the ban of nuclear weapons and related technologies[32].

Today, the area of Semipalatinsk hosts three of Kazakhstan's four research nuclear reactors: the IGR complex hosts one 50 megawatt graphite-moderated reactor; the Baykal-1 complex hosts two, a 50 megawatt impulse graphite reactor and a small uranium zirconium hydride research reactor (which is now no longer in use)[33]. The laboratory complexes also contain two cyclotron laboratories and two particle accelerators.

[31] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 7.
[32] *Ibid.*
[33] *Ibid.*

CHAPTER II

THE NUCLEAR DISARMAMENT POLICY

1. EFFECTS ON DOMESTIC POLICY

Since 1991, the Nazarbayev government has launched several initiatives to support the process of nuclear disarmament in place and to help the population living in highly contaminated areas of Kazakhstan. In particular, since 1992, the Institute of Radiation Safety and Ecology, a secret facility at the time of Soviet experiments on the territory, has been responsible for assisting the Kazakh citizens living in the area of Semipalatinsk, offering them medical examination or treatment to limit the damage of the constant exposure to the radiations[34]. In addition, several studies are being conducted to analyze the consequences of low-level of radioactive contamination on people and the ecosystem.

The state-owned Institute is a subsidiary of the National Nuclear Center of the Republic of Kazakhstan, which is based in Kurchatov, the nearest place to the former nuclear test site. The total area covers more than 21 hectares. The idea behind the establishment of the institute arose after the shutdown of the former nuclear base and the creation of a new management structure of the test site in the shape of a research centre[35]. The Institute is organized on the basis of the Military Unit 52605, formed in June 1948 in Zvenigorod (Moscow region) exclusively for running nuclear tests at Semipalatinsk. The organization and structure of the scientific and experimental unit were changed many times due to the composition and types of departments involved in concrete tasks for tests: in particular, the medical and biological tests department existed up to the disbandment of the test site[36]. The center is also involved in[37]:

[34] Until August 2011, about 350,000 people and their families have benefited of free treatments of the Institute. Republic of Kazakhstan, *Kazakhstan and non-proliferation,* p. 9.
[35] *Ibid.,* p. 13.
[36] *Ibid.*
[37] *Ibid.,* pp. 13 – 14.

- dealing with ionizing radiation sources (IRS), including storage of radioactive agents, application of IRS, their storage and accounting;

- managing the radioactive waste, including decontamination of rooms and equipment, waste collection and sorting;

- providing services in the field of nuclear energy, including radiological monitoring, conduction of examination, analysis and evaluation of radioprotection techniques in use, as well as the reclamation of territories;

- radiological and radio-ecological tracking in works, including activities on the territories of former nuclear test sites and other territories contaminated due to nuclear explosions.

The Institute maintains close cooperation with national and international organizations such as the International Atomic Energy Agency (IAEA), the International Scientific and Technical Centre (ISTC), NATO, research laboratories in the USA and institutes of the Russian Scientific Academy(RSA)[38]. Results of scientific research are reported annually at national and international conferences and seminars on problems of radioecology and radiobiology, which are used to sensitize the international community towards the adoption of policies for nuclear disarmament.

Regarding this objective, Kazakhstan has played a leading role in the establishment of a nuclear-free zone in Central Asia, which became, on September 8, 2006, a legal commitment for the governments of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Subsequently, the treaty is, now, able to prohibit the production, acquisition, testing and possession of nuclear weapons. The treaty, also known as the Treaty of Semipalatinsk, was ratified by the abovementioned countries and entered into force on March 21st, 2009. The long process that led to the signing of the treaty began with the Alma Ata Declaration of 1992, which was followed by a UN resolution calling for the establishment of a nuclear-free zone in Central Asia, adopted by consensus by the United Nations General Assembly in 1997 and reaffirmed in 2000. The Treaty encompasses an environmental component which addresses concerns unique to the Central Asian region: each of the five States hosted former Soviet nuclear weapons infrastructure and now confront common problems of environmental remediation damage resulting from the production

[38] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 14.

and testing of Soviet nuclear weapons[39]. Therefore, in April 2010, the Secretary General of the United Nations, Ban Ki-moon, who paid an official visit to the complex of Semipalatinsk, indicated the Republic as a symbol of disarmament and hope for the future[40].

On November 17, 2010, two co-chairs of the U.S.- Kazakhstan Energy Partnership, Kazakhstan's Minister of Oil and Gas Sauat Mynbayev and U.S. Deputy Secretary of Energy Daniel Poneman announced successful completion of a joint BN-350 Spent Fuel Program which consisted of shutting down Kazakhstan's BN-350 plutonium production reactor in Aktau, securing the spent fuel produced by it, and safely transporting the depleted fuel to the new long-term storage facility at the former Semipalatinsk nuclear test site[41]. Almost 800 nuclear bombs worth of uranium and plutonium were secured under the project co-financed also by the United Kingdom and carried out under the safeguards of the IAEA[42].

In Washington, U.S. Senator Richard Lugar, co-founder of the Nunn-Lugar Cooperative Threat Reduction program, hailed the completion of the project as another example of the strong cooperation between Kazakhstan and the United States, adding that, in 2005, the Nuclear Threat Initiative also worked with Kazakhstan to complete a project at the same reactor, removing and blending down the fresh fuel containing 2,900 kilograms of weapons-usable highly enriched uranium[43]. That blending down was done at Kazatomprom's Ulba Metallurgical Plant in Ust-Kamenogorsk. *"Kazakhstan has a solid history of nuclear non-proliferation and disarmament. The country showed courage and leadership when it renounced the nuclear weapons remaining on its territory, after the dissolution of the Soviet Union. Kazakhstan's leadership understands that the essential steps required to reduce nuclear dangers must be accomplished with the cooperation of all nations,"* Nunn concluded.

Kazakhstan and the United States, along with their partners across the world, are now working to secure vulnerable nuclear material by the end of 2013, in order to prevent a possibility of terrorists' acquiring them[44].

[39] *Ibid.,* p. 11.
[40] *Ibid.*
[41] M. Sieff, *Hundreds of N-Bombs of material secured in East Kazakhstan,* in "Building a nuclear safe world: the Kazakhstan way", p. 50.
[42] *Ibid.*
[43] *Ibid.*
[44] *Ibid.*

2. THE ENERGY ISSUE

The first National Centre for Nuclear Energy of Kazakhstan was made operational in May 2012. Even now, the main objectives of the center are those of eliminating nuclear threats in Kazakhstan and to place the country among the most significant producers of nuclear energy in the world[45]. Kazakhstan is already the world's largest producer of natural uranium and, as we already mentioned, is continuing in an attempt to become the site of the so-called bank of nuclear power, which scope is to preserve low-enriched uranium, in order to supply nuclear reactors of several countries and to ensure them a greater availability of energy in the future[46].

The national program to develop the Kazakh nuclear industry is under the guidance and direction of the National Center for Nuclear Energy, which is headquartered in Semipalatinsk, but its operating centers are located in different cities of the country. The center, in fact, is composed of the[47]:

- Institute of Nuclear Physics (INP) (Almaty, Kurchatov, Aksay Village in East Kazakhstan)
- Institute of Atomic Energy (IAE) (Kurchatov)
- Institute of Geophysical Research (IGR) (Kurchatov, Borovoe, Almaty, Kaskelen, Aktobe, Makanchi)
- Institute of Radiation Safety and Encology (Kurchatov)
- Baikal Enterprise (Kurchatov)
- Kazakh State Research & Production Center of Explosive Operations (Almaty)

The experts of the center hope to develop 20 low-capacity nuclear power plants (50-100 megawatts each) to provide power to small Kazakh towns, also through the use of the experimental Tokamak reactor, in Kurchatov, designed by a team of Russian – Kazakhstan engineers, in order to carry out scientific research and test materials and construction units, which will be used in future

[45] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 10.

[46] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 10.

[47] *Ibid.*

fusion reactors[48]. The Tokamak is a torus-shaped magnetic trap designed to create and retain high-temperature plasma, allowing for thermonuclear reaction to produce energy.

Image 2: Inside of Tokamak

The construction is carried out within the frameworks of design development of the International Thermonuclear Experimental Reactor (ITER) program. The All-Russian Scientific Research Institute of High-Frequency Currents named after Vologdin (VNIITVCH) in St. Petersburg and other Russian scientific and industrial organizations participate in this project[49]. The installation is worth about $15 million. Funding for the Tokamak is provided by the Government of Kazakhstan, and partially, through investments of world research centers[50].

At the present time, Kazakhstan does not have any active center with a capacity of nuclear power generation: the one present in the country, located near Aktau, with reactor BN-350 sodium-cooled, has been made non-operational in June 1999 after 26 years of activity[51]. Even in the soviet-era, however, the primary purpose of the plant was the desalination and not the electricity

[48] *Ibid.,* p. 11.
[49] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 11.
[50] *Ibid.*
[51] World Nuclear Association, *Uranium and Nuclear Power in Kazakhstan,* June 2013, available at http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Kazakhstan/

production, so its power was limited. The country also has in function three research reactors at the former Semipalatinsk nuclear test site.

Kazakh plans for future nuclear power include 300 MWe class units for the western part of the country and smaller cogeneration units in regional cities. Recently, several proposals have been made for the construction of a new nuclear power plant near Lake Balkhash, in the south of the country, and for one or two 300 MWe units at Aktau, in the west[52]. In 2012 the government was reviewing a draft master plan of power generation development in the country until 2030. According to this plan, a nuclear electricity share then should be about 4.5%, requiring about 900 MWe of nuclear capacity[53]. Considering the costs, feasibility studies for 2013 are proceeding on the basis of a plan for the use of pressurized water reactors VBER-300 with a power of 325 MWe and still in the conceptual design phase. However, the project stalled over funding for a while, and alleged Russian reluctance to transfer intellectual property rights on the VBER reactor[54]. The project restarted in March 2013, following the proposal of Kazatomprom (a subsidiary 50% owned by Russian and Kazakh companies) for the creation of a power plant in Aktau, for which the Kazakh government has agreed to build two reactors VBER-300[55].

In September 2010, on the basis of the previous agreement with Japan (April 2007) for the mutual assistance in the construction of nuclear power plants in Kazakhstan, Japan Atomic Power Co, Toshiba and Marubeni signed a technical cooperation agreement with the National Nuclear Centre (NNC) to study the feasibility of building nuclear power capacity[56]. Toshiba said that the Japan Atomic Power Co (JAPC) would provide, through the overall management of the project, proposals such as construction cost estimates, advice on law and regulation, scheduling, and establishment of an operating body; Toshiba would focus on the plant concept, and Marubeni Utility Services would assess economic feasibility including financial evaluation and financing[57]. A further agreement to advance this was signed in February 2013, between JAPC and Marubini Utility Service Ltd with NNC.

[52] *Ibid.*
[53] World Nuclear Association, *Uranium and Nuclear Power in Kazakhstan.*
[54] *Ibid.*
[55] *Ibid.*
[56] *Ibid.*
[57] *Ibid.*

For many Kazakhs, these steps are proud evidence of the country's developing status as a major player in international nuclear policy. They are, however, also a painful reminder of the Soviet-era nuclear traumas: *"Kazakhstan's people and environment have endured tremendous suffering as a result of Soviet nuclear weapons testing,"* said Dr. Togzhan Kassenova, an associate in the Nuclear Policy Program at the Carnegie Endowment for International Peace. *"The majority of people, if asked, would express support for global nuclear disarmament and would display pride of Kazakhstan's own record in shutting down its nuclear testing site and removing all nuclear weapons from its territory."*[58].

Today, the legacy and the ambition to position itself as the state model of the nuclear non-proliferation remain at the center of the country's foreign policy. At the same time, part of the current strength of Kazakhstan, in the field of nuclear energy and also in its ability to contribute to non-proliferation projects, is due to the infrastructure and the expertise gained during Soviet domination, as well as the presence of substantial resources of uranium on the territory (Kazakhstan owns 15% of the world's uranium resources and a growing mining sector – in 2011, were produced 19,450 tons of uranium, planned to be increased further in 2018. Additionally, Kazakhstan has a facility converted to create pellets of nuclear fuel, which, in a short period, will make the country able to sell fuel rather than just uranium – supplying 30% of the world market by 2015)[59].

3. FUTURE INITIATIVES

Strategy 2050

Non-proliferation policies so far adopted by President Nazarbayev, and characterized by the promotion of various international initiatives, aim to make the country a leader in the field of nuclear disarmament. On April 13, 2010, on the occasion of the Global Nuclear Security Summit of Washington, even the U.S. President Barack Obama stressed the significant role of Kazakhstan for the promotion of international security[60]. In this regard, in September 2010, Astana hosted the Conference of the Global Initiative to Combat Nuclear Terrorism.

[58] J. Keenan, *Kazakhstan's Painful Nuclear Past,* available at: http://www.theatlantic.com/international/archive/2013/05/kazakhstans-painful-nuclear-past-looms-large-over-its-energy-future/275795/

[59] World Nuclear Association, *Uranium and Nuclear Power in Kazakhstan.*

[60] A. Mendygalyev, *Strategy 2050: Kazakhstan's Way in Non-Proliferation of Weapons of Mass Destruction.*

Among the most important presidential initiatives, summarized in the Political Strategy 2050, we recall the International Forum for a world free of nuclear weapons, held on October 12 & 13, 2011, in Astana and Semipalatinsk: on this occasion, several Heads of State and international organizations emphasized the role played by Kazakhstan in strengthening the international regime of nuclear non-proliferation[61]. Moreover, since 2012, Kazakhstan has been part of the Group of Eight (G8), a partnership between eight countries (including the United States, Russia and Mexico) against the Proliferation of Weapons of Mass Destruction.

In his address to the people of Kazakhstan, on the occasion of the celebration of the International Day against nuclear tests (August 29, 2013), President Nazarbayev noted that Kazakhstan's Strategy 2050 continue to further support several international initiatives and to contribute to global security[62]. This task is in line with the president's statement at the Seoul Nuclear Security Summit in March 2012, on the adoption of the UN Universal Declaration of a Nuclear-Weapon-Free World as the next step toward getting the countries of the world to sign the Nuclear Weapons Convention[63].

The international nuclear fuel bank

Kazakhstan welcomed the proposal from former US Senator Sam Nunn (on behalf of the Nuclear Threat Initiative) to facilitate the establishment of a nuclear fuel bank for the use of IAEA Member States, unable to acquire nuclear fuel supplies from the market[64]. In fact, on April 6, 2009, Kazakhstan's President Nursultan Nazarbayev said that he would consider hosting such a bank on Kazakh territory, since the country intends to further expand its involvement in the peaceful uses of nuclear energy within the framework of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and the IAEA[65]. A further example of this commitment is the partnership with Russia in the founding of the International Center of uranium enrichment (IUEC), located at Angarsk Electolysis Chemical Combine, in Siberia. Kazakhstan's participation in the IUEC is aimed at facilitating the peaceful use of nuclear energy by making available its uranium for use in power reactors[66]. In this

[61] *Ibid.*
[62] A. Mendygalyev, *Strategy 2050: Kazakhstan's Way in Non-Proliferation of Weapons of Mass Destruction*.
[63] *Ibid.*
[64] Republic of Kazakhstan, *Kazakhstan and non-proliferation*, p. 16.
[65] *Ibid.*
[66] *Ibid.*

context, Kazakhstan supports the Russian proposal for an LEU (low enriched uranium) reserve at the IUEC in Angarsk.

Kazakhstan has also been following the initiative of former IAEA Director General, Dr. Mohamed El Baradei, to develop a new framework for the utilization of nuclear energy based on multilateral approaches to the nuclear fuel cycle. Kazakhstan supports the development of nuclear energy options that ensure full access to the benefits of peaceful nuclear technology, while reducing the potential risks of the further spread of sensitive nuclear fuel cycle technologies[67]. Kazakhstan fully supports the criteria outlined in the statement of Dr. El Baradei (March 2, 2009) to the IAEA Board of Governors; namely, that any future mechanisms should be non-political, nondiscriminatory and available to all States in compliance with their safeguards obligations[68]. Any release of material should be determined by non-political principles established in advance and applied objectively and consistently, and no State should be required to give up its rights under the NPT regarding any part of the nuclear fuel cycle[69].

The ATOM Project

The ATOM Project is an international campaign which aims to create a global support on the question of nuclear testing and the total liquidation of nuclear weapons worldwide. The project was launched during the International Day against nuclear tests, in 2012 by President Nazarbayev, who announced that the purpose of the project is to achieve a rapid entry into force of the Comprehensive Test Ban Treaty and to act as a pressure group for those States which have not yet renounced the use of nuclear weapons as defense measure[70].

The initiative brings up the suffering of individuals, victims of nuclear tests: the authors of the project intend to draw people awareness on the disastrous consequences of the use of nuclear weapons, in countries such as Kazakhstan, the Marshall Islands, Japan and Algeria. Under the project, any person contrary to the spread of nuclear weapons can support the appeal to the governments of the world to ban nuclear testing and to obtain an early entry into force of the

[67] *Ibid.*
[68] Republic of Kazakhstan, *Kazakhstan and non-proliferation,* p. 16.
[69] *Ibid.*
[70] A. Mendygalyev, *Strategy 2050*

Comprehensive Test Ban Treaty[71]. One of the objectives of the project, in fact, is to organize a social movement to carry out a global referendum that will allow people from all over the world to exercise their sovereign right to express their position on the issue of nuclear disarmament[72].

Today, the ATOM project is supported by millions of people around the world. To take part to the initiative, visit the official website http://www.theatomproject.org and sign the online petition. By supporting the project, citizens around the world can come together to promote the ban of nuclear tests and the elimination of nuclear weapons from the planet.

We wish to thank the Embassy of the Republic of Kazakhstan in Italy for the material delivered to the Institute of International Research "Archivio Disarmo" during the implementation of this research work.

[71] Repubblica del Kazakhstan, *Il progetto ATOM - una nuova iniziativa del Kazakhstan per il conseguimento della pace, libero da armi nucleari*, 2013.
[72] *Ibid.*