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Legal assessment of the "Mayak" as a violation of constitutional rights to a healthy environment

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abstract

This article proposes to draw the attention of all persons concerned about environmental safety in the southern Urals, in order to: - the introduction of new technologies - that is, these sources of energy (alternative and safe), which will replace the currently existing nuclear power plants - to strengthen criminal law officials responsible for environmental offenses (including for the accident man-made);- really ensure that environmental programs in accordance with the constitutional order

Art. 42 of the Constitution states: "Everyone has the right to a favorable environment, reliable information about its condition and compensation for health or property by ecological violations" [1], as well as art. 11 of the Federal Law "On Environmental Protection" - specifies the environmental relationship. [2]

Production Association "Mayak" - the enterprise storage and reprocessing of spent nuclear fuel, located near the town of Ozersk, Chelyabinsk region (folksy "zapretka", "the forty" or Chelyabinsk-40).

Production Association "Mayak" is one of the largest Russian centers for radioactive materials.

Combining serves Kola, Novo-Voronezh and Beloyarsk nuclear power plants and processes the nuclear fuel from nuclear submarines and nuclear icebreaker fleet. [3] In cooperation with Rosatom, is building two new furnaces, "... that could vitrify annually and lead to a safe state of about 60 million curies of radioactive high-level waste" - Gennady Podtyosov (Minister of radiation and environmental safety of the Chelyabinsk region).

The company also produces the 1948 weapons-grade plutonium, the first reactor A-1, was launched on May 19, 1948 [4]. In 2009, discussed the possibility of the transfer of production to the Siberian Chemical Combine, but in March 2010, "Rosatom" found it expedient. [5]. These works are carried out in four furnaces vitrification (Safe storage technology for high level waste).

Spent nuclear fuel - lessons from the core fuel elements or groups of fuel assemblies of nuclear reactors, nuclear power plants and other installations (research, transportation and others).

In most modern reactor fuel elements are thin-walled tube of various zirconium alloys, which are "tablets" uranium compounds (usually of uranium dioxide) varying the degree of enrichment and a length of 3 m (VVER) and about

1-3 inches in diameter, fitted on the ends of the plugs to ensure integrity of fuel rods and fuel assemblies in its mounting.

Uranium oxide (IV) - binary inorganic chemical uranium compound with oxygen - a substance dark brown, almost black in color. Chemical formula UO_2 (more precisely, $UO_2 \pm x$). Melting point depending on the stoichiometric composition is from 2840 to 2875 C.

Alloy - a macroscopically homogeneous metallic material.

The chemical composition of the alloy is composed of base metal, specially added alloying elements in the alloy (alloy) and modifying elements, as well as impurities not removed (natural, technological and random). The components of the alloy are mixed in a certain amount and melted. Distinguish cast and powder alloys. Cast alloys are obtained by crystallization of the melt. Powder - compressing the mixture of powders, followed by sintering at high temperature.

Zirconium (Latin: Zirconium; denoted Zr) - sideline sub-element of the fourth group of the fifth period of the periodic table of chemical elements of Mendeleev, with atomic number 40. Simple stuff zirconium (CAS-number: 7440-67-7) - a brilliant silvery-gray color. It has high ductility, resistance to corrosion.

Irradiated nuclear fuel as opposed to fresh, has a significant radioactivity due to the large amount of fission products (for VVER approximately 300,000 Ci in each FE) and the property itself has warmed the air to high temperatures (only just recovered to around 300) and after removed from the reactor core is maintained in the pool 2-5 years extract (PWR) or to the periphery of the reactor core (BN-600). After reducing the residual energy release of fuel it is sent to the storage, disposal or recycling.

Manufacturing Software "Beacon": reactor, reprocessing, chemical metallurgical, radioisotope and instrument-making [6]. Other management, central laboratory, public catering system, telephone exchange.

TROUBLE IN "Mayak" 29 September 1957 (Kyshtym tragedy, Techa River): September 29, 1957 the company took a technological accident - because of a violation of the cooling system collapsed container with highly radioactive waste. The explosion completely destroyed the stainless steel tank containing 70 - 80 tons of waste, plucked and tossed it aside for 25 m concrete slab of the canyon - in the capacity of cells to a buried concrete structures. From the repository to the environment has been thrown a mixture of radionuclides total activity 20000000 Ci. Most of the radionuclides has settled around the store, and the liquid slurry (suspension), the activity of which was 2 million Key, was raised to a height of 1 - 2 km and formed a radioactive cloud of liquid and solid aerosols. Main emission nuclides cerium-144 (66%), and zirconium-95 (25%) and strontium-90 (5%). Radioactive substances smashed into hundreds of square kilometers. The contaminated area is called the "East Ural Radioactive Trace." Its territory with a density of strontium-90 is more than 0.1 Ki/km² sostavila 23 km², 217 were contaminated settlements with a total population of 272 thousand people. The area with the density of strontium-90 is more than 10 Ci/km² is 400 km², and with a density of strontium-90 Ci/km² more than 100 - 117 km². Exposure of the population living in the territory of the East Ural track was both external and

internal 2280 people for 250 days of living have received a dose of about 17 cSv, and 7,300 for 330-770 days of living - about 6 cSv. [7]. From radiation exposure only during the first 10 days killed about 200 people, the total number of victims is estimated at 250,000 people, the accident was estimated to be 6 points on the international seven-point scale [8].

EMERGENCY 1967. In the spring of 1967 as a result of the transfer of radionuclides dust from the dried shoreline of Lake Karachai (position of the discharge medium level liquid waste) at the site of the "Mayak" re-emerged emergency. Due to the lack of control and after low water period 1962-1966 years the water level of Lake Karachay strongly decreased, while baring a few acres of lake bottom with radioactive materials.

Radioactive substances activity 600 Ci consisting primarily of particles of silt, scattered over a distance of 50 - 75 km, strengthening the area contaminated by the accident in 1957 precipitated mixture contained mainly cesium-137 and strontium-90. Radioactive trail covered area 2700 km², including 63 settlements with a population 41.5 thousand people. The absorbed dose from external exposure to 4,800 residents Nearby zone was 1.3 cSv for the residents of the far zone - 0.7 cSv. [9]

HISTORY (Major Incident "Mayak» c 1953 to 2000):

- 15.03.1953 - there was a self-sustaining chain reaction. Pereobluchen plant personnel;
- 13.10.1955 - rupture of process equipment and the destruction of parts of the building.
- 21.04.1957 - SCR (spontaneous chain reaction) in the factory number 20 in the collection of oxalate decantates after filtering sediment oxalate-enriched uranium. Six people received doses of 300 to 1,000 rem (four women and two men), one woman died.
- 02.10.1958 - criticality accident at the plant. Experiments were conducted to determine the critical mass of enriched uranium in a cylindrical container at different concentrations of uranium in the solution. Staff broke the rules and instructions for the YADM (nuclear fissile material). At the time of criticality personnel received doses of 7,600 to 13,000 rem. Three people were killed and one person got radiation sickness and blindness. In the same year, Kurchatov made at the highest level and proved the need for establishment of a special unit of state security. Such an organization has Lyab. [10]
- 28.07.1959 - gap of technological equipment.
- 05.12.1960 - criticality accident at the plant. Five people were pereoblucheny.
- 26.02.1962 - an explosion in the sorption column, destruction of equipment.
- 07.09.1962 - SCR.
- 16.12.1965 - criticality accident at the plant number 20 lasted 14 hours.
- 10.12.1968 - SCR. Plutonium solution was poured into a cylindrical container with a dangerous geometry. One person died and another received a high

dose of radiation and radiation sickness, after which he had been amputated two legs and right arm.

□ 11.02.1976 at the radiochemical plant as a result of unqualified personnel actions was the development of an autocatalytic reaction of concentrated nitric acid with an organic liquid complex composition. The device exploded, there was contamination of the premises repair zone and the adjacent portion of the plant. Index on a scale INEC-3.

□ 02.10.1984 - blast on the vacuum equipment of the reactor.

□ 16.11.1990 - explosive reaction in the chemical tank. Two people were chemical burns, one died.

□ 17.07.1993 city - Accident on radioisotope plant "Mayak" with the destruction of the sorption column and into the environment of a minor amount of α -aerosols. Radiation emission was localized within the plant production areas.

□ 2.08.1993 city - Accident dispensing line pulp plant for purification of liquid radioactive waste incident related to the depressurization of the pipeline and hit 2 m³ of radioactive sludge on the surface of the earth (about 100 contaminated m² poverhnosti). Depressurization of the pipeline resulted in a leak to the surface of the pulp radioactive activity of about 0.3 Ci. Radioactive trace was localized, contaminated soil taken out.

□ 27.12.1993 incident occurred on radioisotope plant where the replacement filter spewed into the atmosphere of radioactive aerosols. Blowout was on α -activity 0,033 Ci, by β -activity of 0.36 mCi.

□ 4.02.1994 recorded an increased release of radioactive aerosols by: β -2-day activity levels for ¹³⁷Cs subsistence levels, the total activity of 15.7 mCi.

□ 30.03.1994 transition recorded by the excess of daily release of ¹³⁷Cs in the 3, β -activity - 1,7, α -activity - by 1.9 times.

□ In May 1994 the ventilation system of the building of the plant spewed activity 10.4 mCi β -aerosols. Emission for ¹³⁷Cs was 83% of the control level.

□ 7.07.1994 on the control plant detected radioactive spot a few square decimeter. Exposure dose was 500 mR / s. The spot was formed as a result of leakage from the drain muted.

□ 31.08. 1994 registered an increased release of radionuclides to the atmospheric pipe building radiochemical plant (238.8 mCi, including a share of ¹³⁷Cs was 4.36% of the annual maximum permissible emission of radionuclides). The reason for the release of radionuclides was depressurized VVER-440 during the operation segments idle all SFA (spent fuel assemblies) as a result of an uncontrollable arc.

□ 24.03.1995 recorded excess of 19% of the norm for the copier plutonium, which can be regarded as a dangerous nuclear incident.

□ 15.09.1995 on the stove vitrification of high-level liquid radioactive waste (LRW) was found to flow of cooling water. Operation of the furnace into the regulatory regime was terminated.

□ 21.12.1995 at cutting thermometric channel exposure occurred four workers (1.69, 0.59, 0.45, 0.34 rem). The reason for the incident - a violation of the company's employees process procedures.

□ 24.07.1995 spewed aerosols ^{137}Cs , the value of which amounted to 0.27% of the annual value of MPE for the enterprise. The reason - the fire filter cloth.

□ 14.09.1995 at replacement covers and grease stepper manipulators registered a sharp increase in air pollution α -nuclides.

□ 22.10.96 occurred depressurization coil cooling water of one of the storage tanks of high-level waste. The result was contaminated pipes of the cooling system repositories. As a result of this incident, 10 staff offices received radiation exposure of $2,23 \times 10^{-3}$ to $4,8 \times 10^{-2}$ Sv.

□ 20.11.96 at chemical-metallurgical plant when working on electrical exhaust fan came aerosol release of radionuclides into the atmosphere, which accounted for 10% of the allowed annual emissions of the plant.

□ 27.08.97 in the building RT-1 plant in one of the rooms was found to be contaminated floor area of 1 to 2 m², the dose of gamma radiation from the spot of 40 to 200 mR / s.

□ 06.10.97 recorded increase of radioactivity in the assembly building RT-1 plant. Measurement of exposure dose showed by up to 300 mR / s.

□ 23.09.98 rise in reactor power, P-2 ("Lyudmila") after triggering automatic protection allowable power level was exceeded by 10%. As a result, the three channels of the fuel rods depressurization occurred that led to contamination of equipment and pipes of the primary circuit. The content of ^{133}Xe in the release of the reactor for 10 days exceeded the annual allowable level.

□ 09.09.2000 has been shut down to "Mayak" power of 1.5 hours, which could lead to an accident. [11]

During the test in 2005, the prosecutor's office has established a violation of the rules for handling environmentally hazardous waste production in the period 2001-2004, which led to the collapse of the Techa River basin in tens of millions of cubic meters of liquid radioactive waste "Mayak". According to the deputy head of the Russian Prosecutor General's department in the Urals Federal District Andrey Potapov, "Found that the factory dam, which has long been in need of refurbishment, water flows into the liquid waste that poses a serious threat to the environment, not only in the Chelyabinsk region, but also in neighboring regions." According to prosecutors, because of the plant "Mayak" in the floodplain of the Techa River in the four years the level of radionuclides has increased several times. As demonstrated by examination of the grounds of infection was 200 kilometers. In hazardous area is home to about 12 million people. In this case, the investigators stated that they are being pressured in connection with the investigation. Director-General of the "Mayak" Vitaly Sadovnikov been charged under Article 246 of the Criminal Code "Violation of regulations on environmental protection in the production of works" and Parts 1 and 2 of Article 247 of the Criminal Code "Violation of the rules for handling hazardous materials and waste." In 2006, the criminal case against Sadovnikov was terminated because of an amnesty for the 100th anniversary of the State Duma.

Techa river - a river polluted by radioactive waste discharged chemical plant "Mayak", located in the Chelyabinsk region. On the banks of the radioactivity is

exceeded many times over. From 1946 to 1956, discharges of medium-and high-level liquid waste "Mayak" was carried out in an open river system Techa-Iset-Tobol 6 km from the source of the river Techa. Later in the Arctic Ocean. Total over the years has been reset 76 million m³ of wastewater with a total activity of β -radiation from 2,75 million curies. The inhabitants of coastal villages were both external radiation and internal. Total radiation exposure were 124 thousand people living in the settlements on the river banks of the water system. Those most exposed to the radiation people of the coast of the river Techa (28.1 million people). About 7.5 million people displaced from 20 localities were average effective dose equivalent in the range of 3 - 170 cSv. Later in the upper part of the river was built by a cascade of reservoirs. A large part (activity) of liquid radioactive waste was dumped in the lake. Karachai (pond 9) and "The Old swamp." Floodplain and sediments contaminated silt in the upper part of the river are considered as solid radioactive waste. Ground water in the Lake. Karachai and the Techa reservoirs contaminated.

The accident at the "Mayak" in 1957, also called "Kyshtym tragedy", is the third-scale disaster in the history of nuclear power after the Chernobyl accident and the accident at the Fukushima I (on a scale INES).

The issue of radioactive contamination of the Chelyabinsk region raised repeatedly, but because of the strategic importance of the chemical plant every time remained unheeded.

The radiation background. Rosatom said that, despite the presence of a nuclear facility, the background radiation in the immediate locality, Ozersk, 5 times lower than, for example, in Chelyabinsk, Yekaterinburg and St. Petersburg. [12]

"The car with damaged containers of bromine (see Appendix A) revised to "Mayak ", the cargo will be processed at the plant, as it has a high-tech production for disposal of hazardous substances ...", "... the movement of trains on station Chelyabinsk - Master not interrupted ... ", " ... in fact spill bromine investigators Ural Investigation Department of Transport initiated a criminal case on the grounds of crime under the first part of Article 247 of the Criminal Code.

"... Transport, storage or other handling of chemical substances in violation of the rules, if these acts have created a threat of substantial harm to human health or the environment" - reported in the service of corporate communications YUUZHD. "[13]

Summing up the above stated, many questions arise: first, those in power, to nuclear scientists, environmental scientists, legal scholars, to colleagues, current teachers and researchers of higher education, and many other professionals, including environmentalists different directions . In addition, on the one hand, it seems that today the majority of countries in the world, including scientists in these countries dealing with security, can not offer an effective alternative mechanism for the introduction of modern sources of safe energy. However, they exist, but are not implemented (or implemented, but not in mass production), and again a lot of questions, such as why?, What hinders? Yes, it is the introduction of alternative and safe energy and energy as a whole instead of nuclear installations, radioactive,

chemical, and particularly dangerous industries. On the other hand, when there is an emergency situation with chemicals similar situation with bromine on the railway, for example, in the city of Chelyabinsk - there is a need to involve processing the "Mayak", which performs the disposal of hazardous substances.

The history of various accidents indicates the number of dangerous precedent phenomena and can be stated as always in Russia, is to rely only on the "maybe", and it is possible that a miracle will happen and for the account of the future development of the original presented experts Skolkovo and other research centers, the situation will change for the better.

"Perhaps»,- this term is not a scientific nature. Well, if the miracle does not happen, and "maybe" does not work? ... The following questions: Who in the world today can guarantee 100% security? Yes, probably, only the Lord GOD, who is also Allah (as a single creator of all things),-could solve this problem. But today, he prefers not to get involved, so let us recall the following popular saying: "... Trust in God, but those who help themselves." This thesis may form the basis, in solving the most complex vital, urgent problems.

Recall, Art. 42 of the Constitution states that "everyone has the right to a healthy environment ..." [1]. And how would be able to comment on this article, operating in the field of power structure in this country. Authorities primarily concerned about the future growth of nuclear power plants not only in our country but around the world too (From the speech of the Minister for Atomic Energy Sergey Kiriyenko). Construction of nuclear power plant,-they are economically justified and bring direct benefits to the state, we should mention here (usually profit "to plunder" in the future). The authorities promised that pure profits, to send the so-called 'Environmental Programs. " It would be recalled and a corruption scandal in the newly created research center "Skolkovo". "... Russia's Investigative Committee opened a criminal case against two senior managers Science City Lugovtseva Kirill, who heads the finance department, and Vladimir Khokhlov, general director of the subsidiary, custom molding loads for" Skolkovo "... [12]

The circle is closed: the government does not control the security system in the state is not eliminated crime of bribery and corruption, on the basis of the same environmental crimes (for example, the former Minister of Atomic Energy Yevgeny Adamov), environmental programs- «fail." The people living near contaminated areas,-suffered from various illnesses, and not just from the inaction of the authorities, it remains for a long period of hostage operating system. A citizen of the country with a variety of moods and attitudes, including political ideas, has the right to engage in any (except those with illegal) and the things you love. However, personal conviction that such a citizen in the first place, is responsible for their actions. He conscientiously doing his job, as in the workplace, office, business, and social services, strive to live honestly in harmony with the laws of the country, society, and respect for the cultural heritage of different peoples and different faiths citizens of any country, is constantly striving to raise the intellectual level as a necessary social product of society.

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13. See: Internet - Electronic resource: <http://go.mail.ru/search?mailru=1&rch=e&mg=1&q=PIO «Mayak»>.

Appendix A

Electronic online resource:
http://news.mail.ru/mainimage/pic/91/80/1166479_800

