Masterarbeit über das Thema

Environmental Issues and their Solutions in Russia: The Nuclear Issue of the Tomsk Region

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Abstract

This thesis identifies the key environmental issues in the Tomsk region and analyzes the work of local governmental and nongovernmental organizations in this regard since 1987. It also studies the impact of the nuclear power site in Seversk on the environment in the quadrangle of interests – the environmental movement, politics, bureaucracy, and the industrial lobby.

The origins of the emergence and development of grassroots environmental organizations and the micro- and macro-historical prerequisites accompanying their formation were identified. The research determined the trends and contradictions in the development of governmental and nongovernmental organizations over time. The main activities of environmental organizations and their relationship with the authorities in solving environmental problems were also examined.

The results showed a destructive impact of the nuclear power plant on the environment, which led to the expansion of a grassroots movement in the region. However, with the tightening of state policy and bureaucratization of the system, environmental NGOs in Tomsk have either ceased to exist or shifted the focus of their work to other problems.

Keywords: environmentalism, environmental politics, nongovernmental organizations, nuclear policy, nuclear impact

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1 Introduction

Today, the concern for the environment has become an inevitable part of the collective consciousness in many Western countries. Around the year 1800 the epoch of the Anthropocene began, in which humans and their societies became a global geophysical force (Steffen et al., 2007). Since then, significant human influence on ecosystems began. This impact reached its peak in the 20th century. The remarkable explosion of industrialization processes, fossil fuel energy, and the growth of the population began with the phenomenon known as the Great Acceleration, or "1950s syndrome," which contributed to rapid economic growth. That period exponentially increased destruction of the natural environment. The human relationship with the natural world has been drastically transformed. The human imprint on the Earth System is mostly related to the extended usage of fossil fuels, which led to the accumulation of carbon dioxide (CO_2) concentration in the atmosphere (Steffen et al., 2007). As a result, the world's climate has been acutely impacted. Increased concentration of CO_2 in the atmosphere can lead to catastrophic consequences. According to the United Nations (n.d.), climate change is the defining issue of the modern world. In order to reach 'net zero' by 2050, "global net human-caused emissions of carbon dioxide would need to fall by about 45 percent from 2010 levels by 2030".

Nuclear energy is argued to be clean, an alternative source for generating power when compared to fossil fuels. However, even though nuclear power plants do not produce direct CO_2 emissions like fossil fuel-fired power plants, they may cause a long-term negative impact for the environment in the following generations. Nuclear energy might even be the most dangerous source of energy. Despite the low chance of an accident at nuclear power plants, the possible consequences of such an accident can be disastrous not only for mankind but also for the environment as a whole. But even without accidents, the storage of nuclear waste is not safe and not sustainable.

The 20th century was marked by a nuclear arms race between the Soviet Union and the United States. Both states jeopardized their citizens and natural environment during the Cold War. Millions of people around the world suffered and still suffer from the radiation and its impact, which originates from nuclear weapon

testing, accidents, leaks, nuclear waste storage and direct exposure at a workplace. The worst catastrophe in Soviet history was doubtlessly the explosion at the nuclear plant in Chernobyl, Ukraine. The Soviet government did not completely succeed in downplaying the scale of the accident, which was soon revealed to the world.

Besides nuclear power issues, there is a range of other environmental concerns around the world. These issues include water and air pollution, deforestation, declining biodiversity, natural hazards, poaching, and other human effects on the earth's surface. Solutions to cope with these issues are being sought at the global level. An ongoing constructive dialogue is the basis for agreements concerning our planet. The Non-Proliferation Treaty, The Paris Agreement, the Kyoto Protocol, and the United Nations Framework Convention on Climate Change are the most essential agreements in this regard. In addition, young activists around the globe are taking action on climate change.

Compared to many Western countries, Russia has been taking less steps towards building a collective consciousness on climate change and all related environmental issues. These actions correlate with the Soviet history and the Iron Curtain, as a result of the governmental ideological propaganda and repressions of dissidents. In the Marxist-Leninist attitude nature was a resource to be dominated and exploited by humans. However, towards the end of the Cold War, there were positive tendencies of growing ecological awareness as a result of American-Soviet citizen diplomacy. Human interaction and eagerness for peace glimpsed through the Iron Curtain.

Among the world's numerous environmental problems, special attention should be paid to the issues of the West Siberian Plain in Russia. One of the cities in the region that requires such attention is Tomsk. Seversk, a monotown[1] with one of the biggest nuclear power complexes in Russia, is located in close proximity to Tomsk. Although Seversk was a secret city during the Soviet period, the emerging environmental movement in Tomsk was taking effective steps to resist the atomic lobby. A surge of citizen diplomacy in the late 1980s spread throughout Soviet Russia, and at the same time, the first environmental NGO in Tomsk was born. This thesis studies the impact of the nuclear power site in Seversk on the environment and on human health, the environmental policy in the region, and the emergence of

[1] A monotown is a town whose economy is dominated by a single industry or company.

environmental nongovernmental organizations (NGOs) and their contribution towards addressing these issues. Other environmental issues beyond nuclear power will also be discussed briefly. The objectives of the research are to identify the key environmental issues in the Tomsk region and analyze the work of local governmental and nongovernmental organizations in this regard since 1987. The following research questions will be addressed: What is the scale of destruction of the nuclear power plant in Seversk? To what extent could NGOs help solve the environmental issues in Tomsk? What is the scope of for action both on the official level and the levels of grassroots movements?

This thesis consists of seven chapters. The introduction is followed by the research framework and methodology. It introduces the primary sources and explains the focus of the research and the chosen time span. It also describes the methodological approach. The third chapter provides a background of the topic, including the emergence of environmentalism in Russia, environmental policy, and a legal framework for nongovernmental organizations. Its goal is to aid in understanding the roots of ecological problems and policy and to analyze the current state of problems. The fourth chapter studies the overall ecological state of the Tomsk region and analyzes the environmental issues, focusing on the nuclear power plant in Seversk. It will describe the parties involved in the environmental damage. The fifth section gives an overview of the environmental organizations in Tomsk, both on governmental and nongovernmental levels, and analyzes their scope for action regarding the existing issues. It also includes the interviews that I conducted with activists from three different environmental NGOs. The sixth chapter introduces expert opinions on the issue by two prominent nuclear physicists: Thomas B. Cochran and Andrei Ozharovskii. Both were involved with environmental NGOs in Russia, including the activists from Tomsk. The final section summarizes the results of the research.

2 Research Framework and Methodology

Before starting this research, I never realized the extent of the environmental issues that the Tomsk region is facing. The main question that kept vexing me for weeks was whether my fellow citizens were aware of these problems. In the beginning, I identified seven ecological issues that are typical for the region: nuclear power issues (including the military and industrial use and waste), waste issues (industrial impact and waste disposal), potable water issues, deforestation, poaching (resulting in biodiversity issues), air pollution, and the impact of the oil and gas industry. All these issues need urgent solutions; however, nuclear power was chosen as the main one for several reasons.

The nuclear power plant near Tomsk has received much international attention over the last two decades. There is a lot of material on the topic, which includes reports of regional, national, and international institutions and organizations; newspaper and magazine articles by journalists, ecologists, and scientists from other fields; books; interviews of activists and scientists; and legislative documents. The primary sources include archival materials of the environmental organizations in Tomsk, which comprises a digest of documents and reports (special commissions, state and regional committees on ecology, scientists' reports, expert analyses, briefing notes, statements by activists, recollections of eyewitnesses, opinions of public and state representatives, and newspaper clippings by journalists, ecologists and scientists).

These materials are mostly comprised in the digest "The SCC Through the Eyes of the Green Movement" (*SKHK glazami zelenogo dvizheniia)* created by Koniashkin and Boltachev in 1994. There are also materials from joint American-Russian conferences; regional, national, and international articles; and interviews. The sources also include books on environmental history. In addition, the official websites of Rosatom, the Siberian Chemical Combine, various environmental organizations (or their pages in social networks), and legislative documents were helpful.

The material comprises altogether a time period of more than 20 years and documents the life cycle of the nuclear plant near Tomsk since 1949. Given that the

international community only learned about the nuclear plant in 1993 after a major accident, this year was chosen as the outset of the research. However, the six years prior to the accident will be included to illustrate the emergence of the first non-governmental organization in the region. An enormous amount of material confirmed the importance and severity of the matter. Nevertheless, it was not enough to shed light only on the nuclear power plant and its impact but also on the work of the local environmental organizations.

In the midst of the research, I went to Tomsk to search for valuable information at the Tomsk Regional Universal Scientific Library named after A. S. Pushkin (*Tomskaia oblastnaia universal'naia nauchnaia biblioteka im. A. S. Pushkina*). This library's archives included materials on local environmental organizations that are not available online. The information found there changed the whole vision of the research topic. I decided to focus only on the nuclear power issue and define the role of the non-governmental organizations in this regard. Since current research focuses on nuclear issues only, it could be a starting point for further research in getting a more complete environmental picture of the Tomsk region.

The approach chosen for this thesis is interdisciplinary, including scientific, sociological, historiographical, and cultural dimensions. Historians Wolfram Siemann and Nils Freytag (2003) define environmental history as a basic historiographical category, equal with power, economics, and culture. The interactions between people and nature are the center of environmental history. Its classical research field consists of so-called 'environmental media': soil, water, air, and forest, as well as energy sources: wood, coal, and oil. Environmental history comprises interdisciplinary and international cooperation, including historiographical subdisciplines as well as historical geography, geobotany, forestry, climatology, cartography, landscape ecology, and folklore. Defining environmental history allows for defining how to act in specific politics (Ibid, pp. 8-9). A responsible action can consist, for instance, of only knowing the coordinate grid.

These coordinates extend across the space and time of the "environment," which is why a historical perspective is addressed. Siemann and Freytag emphasize the uniqueness of environmental history, namely the combination of the micro- and macro-historical points of view. So, by addressing natural resources such as wood and coal, the environmental historian practically transforms energy sources into a

subject. He thus opens up a fundamentally new field of study because people are dependent on the resources of their environment (Ibid, pp. 10-11).

By applying this methodological approach to this thesis, addressing and assessing environmental issues in Tomsk, namely the use of nuclear power, this energy source will be turned into a subject. The environmental nongovernmental organizations in Tomsk pursue their agenda in fighting the impact of the nuclear power complex in Seversk, postulating that its work is destructive towards nature and humans. Since nature and humans together (society, culture, and politics as one entity) are the environment, it is a basic category in the consciousness of the Tomsk NGOs. More-over, the destructive impact of the nuclear power plant in Seversk reveals the effect of humans on their environment and shows a web of interests and options for action.

Environmental issues are complex and multidimensional; thus, they need to be addressed from a macro- and micro-historical point of view. This thesis will also include a perspective in the quadrangle of interests – the environmental movement, politics, bureaucracy, and industrial lobby (Ibid, p. 16). The next chapter examines the emergence of environmental movements and environmental policy in Russia.

3 Environmental Background in Russia

3.1 Environmentalism in Russia

An appreciation of nature and ecological awareness have been integral parts of certain cultures since ancient times. However, the word "environment" has appeared only much later. The word "environment" is derived from the Middle French preposition "environ," meaning "that which surrounds." The meaning of the word "environment" preceded by *the* and unmodified, "usually refers to the natural world" (Merriam-Webster, n.d.).

Environmentalism as a philosophical and ideological movement has been rapidly gaining momentum in recent decades not only in Western countries but also in Russia. This is due to growing environmental concerns facing the international community, which have mainly been caused by anthropogenic factors. In dictionaries there seems to be no general definition of 'environmentalism.' The *Merriam-Webster* dictionary (n.d.) gives two definitions of this word:

> 1**:** a theory that views environment rather than heredity as the important factor in the development and especially the cultural and intellectual development of an individual or group
> 2**:** advocacy of the preservation, restoration, or improvement of the natural environment especially**:** the movement to control pollution

The *Encyclopedia Britannica* (2020) explains the concept of environmentalism as a:

> political and ethical movement that seeks to improve and protect the quality of the natural environment through changes to environmentally harmful human activities; through the adoption of forms of political, economic, and social organization that are thought to be necessary for, or at least conducive to, the benign treatment of the environment by humans; and through a reassessment of humanity's relationship with nature. In various ways, environmentalism claims that living things other than humans, and the natural environment as a whole, are deserving of consideration in reasoning about the morality of political, economic, and social policies.

In this thesis, the term will refer not only to the social movement but primarily to general environmental concerns and consciousness throughout the stages of environmental advocacy in Russia. According to Josephson et al. (2003) in their book "An Environmental History of Russia," the stages include Nature and Society in Pre-Petrine Russia (900–1700); Environmental Protection and Resource Development in the Russian Empire (1861-1925); Stalinism (1920s -1953); The Khrushchev Reforms, Environmental Politics, and the Awakening of Environmentalism (1953-1964); Developed Socialism, Environmental Degradation, and the Time of Economic "Stagnation," (1964-1985); Gorbachev's Reforms,

Glasnost, and Eco-Nationalism[2] (1985-1991); The Post-Soviet Russia (1991 - now). In this brief historical overview, the last two stages are the most relevant to the research scope; thus, they will be discussed in detail. These stages include both "from above" and "from below" levels of action which show the interaction between ordinary citizens, scientists, and the government. However, this research comprises the analysis of different authors who describe an environmental history in Russia and the emergence of environmentalism.

The Slavic peoples lived in small villages and the forest for several centuries after the establishment of Rus' in the ninth century. An increasing usage of forest put pressure on the state (Josephson et al., 2003, p. 27). The earliest environmental thinking goes back to the Middle Ages, as nature was sanctified in the forms of "shamanism, animism and other religious activities" (Boreiko, 1997, as cited in Josephson et al., 2003, p.28). These activities were meant to help peasants "comprehend an otherwise capricious and powerful nature that seemed beyond their control" (Josephson et al., 2003, p. 28).

Engagement of the society in favor of concerns about flora and fauna (mostly forests concerns) appeared in the 18th century, although this was in connection to agricultural activities. According to Josephson et al. (2003, p. 25), in the late 18th century there was a small number of societies, supported by the Imperial Academy of Sciences,[3] who contributed to the study of "fisheries, forests, water resources, and the mineral wealth of the country." Some of those societies were autonomous and made efforts to "improve communications, transport, agriculture, forestry, and fisheries." Nature conservation was in the early stage of its development. However, a number of organizations showed interest and activity in preservation, conservation, and the environment. Many Russian and Soviet scientists were engaged in teaching activities, and some of them studied and researched abroad. Apart from scholarly achievements, several "voluntary associations, amateur societies and movements aimed at nature and culture protection" (Ibid, p. 107) were established.

One century later, forestry societies at the national and provincial levels were established, "where they and their counterparts in the government discussed national

[2] The term was proposed by Jane Dawson, meaning an upsurge of the anti-nuclear power movement in the USSR that was linked to nationalistic concerns. Dawson, J. (1996). *Eco-Nationalism: Anti-Nuclear Activism and National Identity in Russia, Lithuania, and Ukraine* (Illustrated ed.). Duke University Press Books.

[3] Officially *Sankt-Peterburgskaia akademiia nauk* (1724—1917), founded by Peter the Great.

resource questions. Although they were poor and overworked, they were enthusiastic" (Ibid, p. 34). The late 19th century included different expeditions and research on Russian natural resources conducted by the specialists. The scientists wanted to "discover laws of nature and apply them for the betterment of humankind." Vladimir Vernadskii was one of the most prominent founders of the "modern environmental thought," whose goal was "to promote the well-being of the masses, including of their environment" (Ibid, pp. 53-55).

That period marked the emergence of regional communities concerned with nature. After the emergence of Soviet power and the wave of anarchism that led to the destruction of natural resources, the All-Russian Society for the Protection of Nature (*Vserossiiskoe obshchestvo okhrany prirody* or *VOOP*[4]) was founded in 1924. It was initiated by scientists and established by the state. At that time, the VOOP was "the most influential voluntary society" that "flowered into a mass organization" whose focus was "mass education and scientific research" (Ibid, pp. 65-66). There have also been several youth and student nature protection organizations called *druzhiny*.[5] Their focus was largely on local issues such as poaching and organizing new protected sites.

Comprehensive environmental movements[6] in Russia gained momentum only in the late 1980s to early 1990s. The Chernobyl accident in 1986 was undoubtedly a crucial moment in the upsurge of such activism. Those times were also marked by the strengthening of ties between ordinary citizens, activists, and scientists in the USSR and the United States, which brought many benefits, especially on environmental issues. The activists did not trust the government anymore and thus required transparency and immediate actions. Nongovernmental organizations of that time were called "informal" (*neformal'nye organizatsii*), and environmental activists were referred to as "green" (*zelenye*).

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[4]The website of the VOOP: http://voop-rf.ru/

[5] More about student organizations and nature protection activism in 20th century: Weiner, D. R. (1999). *A Little Corner of Freedom: Russian Nature Protection from Stalin to Gorbachev*. University of California Press.

[6] However, the Baikal protection movement developed in 1958-1961. It was a response to "plans unveiled at the 1958 conference to increase hydroelectric power by setting off massive quantities of explosives at the source of the Angara river and to build two cellulose combines on or near Baikal — Baikal´sk and Selenginsk. The movement also grew in response to rising concerns in the Baikal region about disappearing fish stocks, over-cutting of forests, and multi-source pollution" Nicholas B. Breyfogle (2015). At the Watershed: 1958 and the Beginnings of Lake Baikal Environmentalism. *The Slavonic and East European Review, 93*(1), 147-180. doi:10.5699/slaveasteurorev2.93.1.0147

Numerous environmental rallies were held; the anti-nuclear movement was on the rise. Between 1988 and 1992, activists managed to prevent more than 100 nuclear projects in the Soviet Union. In the mid-1990s, when the wave of mass protests receded, the construction of some nuclear power plants resumed. For example, the construction of the nuclear power plant in Kalinin continued, although the results of the state environmental expertise had been negative. Later on, when President Putin came to power, he called for a rapid revival of the nuclear program, which gave a strong new impulse to the continuation of the project. Another reason why many anti-nuclear organizations disbanded was the decreasing support of the population. Moreover, almost no nuclear power plants were built in the 1990s, and the state did not have sufficient financial resources for new programs to build nuclear power plants. So, the majority of anti-nuclear groups also lost their interest in resistance (Nikulina, 2011).

The most prominent organizations of that time were the still-active Russian Social-Ecological Union (*Rossiiskii sotsial'no-ėkologicheskii soiuz*) and EcoDefense! (*Ėkozashchita!*) that was later confronted with many allegations from the state.

Since Vladimir Putin became President, environmental organizations and anti-nuclear initiatives, in particular, have experienced increasing difficulties.[7] From 2005-2009, EcoDefense! organized a joint campaign with German environmentalists against the export of radioactive waste from a uranium company in Gronau, Germany to Russia. This campaign led Rosatomand Urenco[8] to stop the planned nuclear waste transport to Russia. Many activists from Moscow, St. Petersburg, Yekaterinburg, and Tomsk participated in this campaign (Nikulina, 2011).

Even though the time for mass protests has passed and there are obstacles from the authorities, environmental organizations still have room for action. The internet is one such way to raise awareness.

3.2 Environmental Policy and Legal Framework for Non-Governmental Organizations in Russia

In the Russian Federation, the term *environment* is enshrined in law. The Federal Law of January 10, 2002 (as amended on March 9, 2021) “On environmental

[7] This is described in more details in the next subchapter.

[8] Urenco is an international supplier of enrichment services and fuel cycle products for the civil nuclear industry.

protection" ("Ob okhrane okruzhaiushchei sredy") introduces two relevant definitions: *environment* and *natural environment*. Environment represents a set of components of the natural environment, natural and natural-anthropogenic objects, as well as anthropogenic objects. Natural environment represents, in turn, a set of components of the natural environment, natural and natural-anthropogenic objects, not including purely anthropogenic objects (Federal′nyi. zakon N 7-FZ, 2021). In this thesis, the term 'environment' is used, referring to 'environment' and 'natural environment' interchangeably.

The Federal Law also includes the term *environmental protection*, activities of public authorities of the Russian Federation, public authorities of subjects of the Russian Federation, local self-government bodies, public and non-profit organizations, legal entities and individuals aimed at preservation and restoration of the natural environment, rational use and reproduction of natural resources, prevention of adverse effects of economic and other activities on the environment, and elimination of its consequences.

However, laws on protection of nature have been developing gradually but inconsistently and not in a consequential way. Starting in the thirteenth century, the state controlled the forest when "the first tsars strengthened their property rights to permit inheritance through appropriate deeds." Later, during the Westernization of the Russian Empire by Peter the Great, there were attempts to protect forests, "especially along waterways to prevent erosion and to protect oaks necessary for naval construction" (Josephson et al., 2013, pp.29-30). The tsar did not particularly care about the forests and rivers but rather about the needs of the fleet since oak was the main tree for the warship construction of that time.

In the next two centuries, there were a number of laws, statutes, and instructions concerning particularly the health of forests. There were several forest journals containing all the data. However, all these documents reveal "that the foresters and state representatives still could not determine how best to manage the trees" (Ibid, p. 35). Nonetheless, although these were not examples of conscious holistic environmental laws as we know them today, they may have still laid the foundation for the development of environmental legislation.

Russian historians distinguish three stages in the development of environmental legislation in Russia. They include the late 19th century till the first half of the 20th century, from the mid-twentieth century to the eighties, and from

about the early eighties to the present time. These stages are rather relative, yet they reflect the formation of the environmental policy. During the first phase, especially in its initial stage, nature protection was understood not as protection of the natural environment as a whole but mainly as protection of rare and endangered animal and plant species (Vedenin, 1998). After the devastating outcome of the Russian Revolution and the end of the First World War, Vladimir Lenin and the Bolsheviks came to power in 1917. They "welcomed the application of science to the control of nature." However, they "nationalized all forests, waters, and subsoil minerals with the goal of rational use but encouraged anarchy." On the one side, residents poached wood and on the other side, Bolshevik terror led to "confiscation of private property". The resulting anarchy put natural resources and cultural monuments at great risk (Josephson et al., 2013, pp.61-63).

In the 1920s, with the nationalization of all-natural resources, a number of laws[9] concerning the protection of natural sites were passed. Moreover, various kinds of nature reserves, natural parks, zakazniks[10] and zapovedniks[11] were established for this purpose. The second phase is characterized by a significant expansion of the very idea of nature protection (Vedenin, 1998). The growing pace of industrialization should also be taken into account. Industrial facilities were built at a rapid pace, which led to multiple environmental problems in the regions. At the same time, environmental legislation aimed at preserving forest and water resources was further improved, water and air quality standards were developed, and measures were taken to protect public health (Shmygleva, 2003).

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[9] For example, Forest Code of the RSFSR (1923) https://www.booksite.ru/forest/forest/orginize/3.htm Or Decree on the Protection of Natural Monuments, Gardens and Parks (1921): http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=17218#07723455692892651

[10] A *Zakaznik* is an area set aside for the preservation of smaller ecosystems and/or individual species. Zakazniks may be protected on the federal or regional level. Restrictions on commercial activities are sometimes only in effect during certain seasons. Categories of Zakaznik include zoological, botanical, landscape, geological, and others. The Federal Law of March 14, 1995 (as amended on December 30, 2020) "On specially protected natural areas" ("Ob osobo okhraniaemykh prirodnykh territoriiakh") states: "Any activity is permanently or temporarily prohibited or restricted in the territories of state zakazniks if it contradicts the purposes of creation of state zakazniks or if it causes damage to natural complexes and heir components" (Federal′nyi zakon N 33-FZ, 2020). http://www.consultant.ru/document/cons_doc_LAW_6072/

[11] Ibid. A *Zapovednik* is a protected area (land or water area) which preserves and protects in its natural state its entire natural complex. Any human economic activity is forbidden on the territory of the zapovednik, except as provided for in this Federal Law. The land plots and natural resources located within the boundaries of state zapovedniks are under federal ownership. As a rule, zapovedniks (unlike zakazniks) are closed to tourists, but some of them still have a visitor permit system.

As during Stalin's time, the control over all institutions and organizations tightened, including environmental organizations. However, the environmentalists still promoted their nature-protection goals, while rhetorically demonstrating loyalty to the regime (Josephson et al., 2013, p. 112). Stalin gained more power, as control over all institutions and organizations had been tightened. Ecology specialists had to be careful about insisting on the value of pristine nature and wilderness to humanity, since this "suggested distance from the needs of the proletarian for socialist reconstruction", (Ibid, p. 109).

The industrialization process kept growing. The enormous scale of nature exploitation, extensive development of the national economy, and the degradation of unique natural complexes caused the adoption of important resolutions of the USSR Council of Ministers on Lake Baikal, the Caspian Sea, and the Ural and Volga Rivers in the second half of the 1960s. However, even these measures were not enough to radically improve the situation and were more like fighting the consequences rather than the causes of the ecological crisis. Only in the 1970s and 1980s were environmental problems recognized as a priority in the USSR (Shmygleva, 2003). So, the third phase is characterized by an all-encompassing understanding of environmental protection, not just of natural resources. During this period, the concept of environmental law emerged, and courses on environmental law were introduced in many educational institutions (Vedenin, 1998).

The grassroots environmental movement in the late 1980s helped to establish and develop the environmental law and legislation and aid in the creation of government institutions for environmental protection and the use of natural resources. As a result of the powerful "environmental outburst" among the population, the State Nature Protection Committee of the USSR (*Goskompriroda)* was formed in 1988. In many regions, either activists from non-governmental movements or people who enjoyed the support of the environmental community came to work in the bodies of the *Goskompriroda* (Koniashkin, 1997, p.34). In the late 1980s and early 1990s, Russia's state environmental policy underwent significant changes for a number of reasons: high levels of environmental pollution and worsening public health, changes in the socioeconomic and political spheres due to perestroika, an increase in public concern about environmental degradation, and the low effectiveness of environmental policies of previous decades (Shmygleva, 2003).

After the collapse of the Soviet Union, the Ministry of Ecology and Natural Resources of the Russian Federation (*Ministerstvo ėkologii i prirodnykh resursov Rossiiskoi Federatsii*[12]) was founded in 1991. A number of environmental laws[13] were passed in the 1990s. Nonetheless, Shmygleva claims that despite the new environmental approaches, the effectiveness of environmental policy remained low, legislation was not more than a formal frame, and the regional regulatory framework developed very slowly. Numerous reorganizations of the structure and activities of environmental protection bodies in Russia led to the destruction of well-established mechanisms of environmental protection. It also led to overlapping of powers by federal and executive authorities and difficulties in organizing the work of the environmental protection system. Regions did not know how to apply the law because there was no clarifying law of its own. In addition, these problems were related to insufficient funding and personnel in the regions.

As of 2021, the bodies of state power in the field of environmental protection, managed by the Government, include the Ministry of Natural Resources and Environment of the Russian Federation (*Minprirody)*, subordinate agencies, departments, and inspections. The state provides environmental monitoring,[14] including environmental conditions and pollution, the radiation background, subsoil conditions, and much more. Furthermore, Federal Target Programs[15] have been developed and are being implemented in the regions at the state level, including the topics of biodiversity, lake Baikal, the quality of the environment, etc. There is also the Federal Service for Ecological, Technological and Nuclear Supervision (*Rostekhnadzor*). In 2019, the number of organizations that started activities in the field of nuclear energy use for the first time was 176; the number of organizations that terminated activities in the field of was 127.[16]

There is a number of public environmental organizations in the Russian Federation. However, it is essential to define the terms in this regard in the Russian

[12] The Ministry was renamed and reorganized several times. Since 2008, it has been called the Ministry of Natural Resources and Environment of the Russian Federation (*Ministerstvo prirodnykh resursov i ėkologii Rossiiskoi Federatsii*). https://www.mnr.gov.ru/

[13] The state has enacted about thirty laws related to the environment. For example, On animal life (*O zhivotnom mire* (1995)), On the radiation safety of the population (*O radiatsionnoi bezopasnosti naseleniia* (1996)) or On industrial and domestic waste (*Ob otkhodakh proizvodstva i potrebleniia* (1998)). The documents may be found in the legal and reference system: http://www.consultant.ru

[14] The full document: https://docs.cntd.ru/document/499038246

[15] The full document: https://base.garant.ru/73874244/

[16] The website of *Rostekhnadzor*: https://www.gosnadzor.ru/

and English language, in order to talk about the legal framework for such organizations. In the English language, there is a clear definition of *Non-Governmental Organizations:*

> nongovernmental organization: an organization which is neither a government department, nor a business operating for profit. NGOs are often paid for by the government and may work with government departments, but they are independent of the government. (Macmillan Dictionary, n.d.)

According to the Cambridge dictionary (n.d.), a non-governmental organization is an organization that tries to achieve social or political aims but is not controlled by a government. There is also the term *non-profit organization* in the Encyclopedia Britannica:

> […] also called (in the United States) not-for-profit organization, an organization, typically dedicated to pursuing mission-oriented goals through the collective actions of citizens, that is not formed and organized so as to generate a profit (Irvin, 2017).

In the Russian language, there is more ambiguity in these terms and regulations. The most common term is *obshchestvennaia organizataiia* or *obshchestvennoe ob"edinenie,* which may be literally translated as *public organization* or *association.* According to the Federal Law of the Russian Federation "On Public Associations" (*Ob obshchestvennykh ob"edineniiakh*) of May 19, 1995, a public organization is a membership-based public association established on the basis of joint activities to protect common interests and to achieve the charter goals of the citizens united (Federal′nyi zakon N 82-FZ, 2020).

The Federal Law of January 12, 1996 (as amended on December 30, 2020) "On non-profit organizations" (*O nekommercheskikh organizatsiiakh*) describes it as an organization that does not make profit the main goal of its activity and does not distribute its profits among its members. Non-profit organizations can be established to achieve social, charitable, cultural, educational, scientific and management goals, to protect citizens' health, develop sports and physical culture, satisfy spiritual and other non-material needs of citizens, protect rights and lawful interests of citizens and organizations, resolve disputes and conflicts, provide legal assistance, as well as other purposes aimed at achieving public benefits (Federal′nyi zakon N 7-FZ, 2020).

The term *third sector* (tretii sektor) is also being used as a synonym for non-governmental non-profit organizations along with *public sector* (obshchestvennyi sektor), *civic sector* (grazhdanskii sektor) or *voluntary sector* (dobrovol′cheskii sektor). The term *civil society* (grazhdanskoe obshchestvo) is also relevant to the

context, which implies a set of non-state relations and institutions expressing the private interests of citizens in various sectors. For the sake of simplicity, the abbreviation "NGO" is used in the research.

After years of the successful fight of the environmental movement, Vladimir Putin's growing power led to a tightening of legislation towards NGOs and increased the state control over them. Even before introducing the "Foreign Agents Law"[17] (*Zakon ob inostrannykh agentakh*) in 2012, control of the activities of environmental non-profit organizations had already taken place in 2000.

According to the executive director of the Institute of Environmental and Legal Problems *ĖKOIuRIS*,[18] Aleksandr Veselov (2000), in doing so, the state was thus distracting public opinion from the problem of the corrupt state apparatus and the unlimited influence of transnational corporations on political structures. He stated that Western financial aid activates public opinion on the problems of developing democracy in Russia and taking public opinion into account in making environmentally significant decisions. Aleksandr Veselov claims that certain political interest in such aid exists, but it coincides with the interests of the society.

Indeed, an established anti-nuclear movement and other environmental NGOs have been put under pressure but continued their activism. In 2008, the Russian government adopted a plan to build new nuclear power plants in Russia. Various laws on radioactive waste were also signed, including the importation of nuclear waste. Although the State Duma has banned the direct import and export of radioactive waste, this does not apply to spent nuclear fuel. A spike in environmental protests led to positive results on this issue in 2005-2009, but the importation of nuclear waste from Germany resumed[19] in 2019.

Along with these events, there was pressure on environmental NGOs, which eventually led to the adoption of the "Foreign Agents Law" in 2012. This law implies that an organization must declare itself a "foreign agent," and if it fails to do so voluntarily, it will be fined. Once included in the register, all published and

[17] The official name of the federal law is "On amendments to certain legislative acts of the Russian Federation regarding the regulation of the activities of non-profit organisations performing the functions of a foreign agent" ("O vnesenii izmenenii v otdel′nye zakonodatel′nye akty Rossiiskoi Federatsii v chasti regulirovaniia deiiatel′nosti nekommercheskikh organizattsii, vypolniaiushchikh funktsii inostrannogo agenta").

[18] The organization was liquidated.

[19] More about the resume: https://greenpeace.ru/news/2019/10/23/v-rossiju-snova-nachali-vvozit-othody-obogashhenija-urana-iz-germanii/

disseminated materials must state that the organization "performs the functions of a foreign agent." Such NGOs are required to submit financial documents to the state on a quarterly basis, information about their activities and management once every six months, and an auditor's report annually. According to public activists, such bureaucracy simply paralyzes the work of regional and modestly funded NGOs, not to mention the fact that it imposes an additional financial burden on them (Bellona, 2016). Later on, the Ministry of Justice (*Ministerstvo iustitsii Rossiiskoi Federatsii* or *Miniust)* was given the right to forcibly include NGOs in the register of foreign agents.

It should also be mentioned that the Rosatom[20] State Nuclear Energy Corporation (*Gosudarstvennaia korporatsiia po atomnoi ėnergii Rosatom)* falls under the category of NGOs. Rosatom operates under the wing of the Russian Federation and is also the state management body for the use of atomic energy. The corporation owns assets in all parts of the nuclear energy chain: from geological exploration, uranium mining, production and enrichment, fuel fabrication, nuclear power plant engineering and construction, machine building, heat and electricity generation, to the decommissioning of nuclear facilities and the management of spent nuclear fuel and radioactive waste. Rosatom promotes the nuclear power industry and positions itself as a corporation pursuing[21] the Sustainable Development Goals. Moreover, Rosatom has schools[22] all over Russia, the International Children's Art Project "Nuclear Kids"[23] and other projects and programs that advocate the use of nuclear energy. The corporation claims to support NGO initiatives to create a comfortable social environment in the areas where nuclear industry facilities are located.

[20] Rosatom was founded in 2007, which was preceded by the Federal Agency for Atomic Energy (*Federal'noe agentstvo po atomnoi ėnergii*) in 2004-2008, Ministry of Atomic Energy of the Russian Federation (*Ministerstvo po atomnoi ėnergii Rossiiskoi Federatsii* or *Minatom*) in 1992-2004, Ministry of Atomic Energy and Industry of the USSR (*Ministerstvo atomnoi ėnergetiki i promyshlennosti SSSR*) in 1989-1991, and the Ministry of Medium Machine-Building Industry of the USSR (*Ministerstvo srednego mashinostroeniia SSSR* or *Minsredmash)* in 1953-1989.

[21] More about their goals: https://www.rosatom.ru/sustainability/

[22] Projects of Rosatom: https://rosatom.ru/career/obrazovanie/proekt-shkola-rosatoma/

[23] The "Nuklear Kids" project: https://nuckids.ru/en/111

4 Environmental Conditions in the Tomsk Region

4.1 Overall Environmental and Economic State

The Tomsk region (Tomskaia oblast'[24]) is located in the southeastern part of the West Siberian Plain and consists of a total area of 314,400 square kilometers. Consisting of more than 60% forest, the vegetation is dominated by swamp and taiga complexes. In the Tomsk region, there are 249 protected areas, including 17 reserves (Zakazniks), 109 natural monuments, the Siberian Botanical Garden (founded in 1880), and 119 protected areas of local importance (Samoilova et al., n.d.). Additionally, the Great Vasyugan Mire is a natural phenomenon and a UNESCO world heritage candidate. Its total area is 53,000 square kilometers. The region is rich in bodies of water, all of which belong to the basin of the Ob River. As of January 2021, the population[25] of the region is 1,070,339, of which 589,701 live in the city of Tomsk and 112,143 in Seversk, according to the Federal State Statistics Service. Tomsk is the administrative center of the oblast' and was founded in 1604.

The Tomsk region is rich in natural resources. Subsoil assets of the Tomsk region make up its resource potential. Deposits of coal, construction sands, white clay (brick and ceramic), large deposits of sand and gravel, semi-precious stones, deposits of rare-earth metals (antimony, zinc), titanium, bauxites, zirconium, gold, etc. are spread over this area. The total stock of peat is more than 200 million tons. There are also reserves of carbon dioxide, sodium bicarbonate, and chloride-sodium waters (Prirodnye resursy, 2015).

The economy of the northern districts of the Tomsk region is based mainly on oil and gas production. The population of the southern regions is engaged in agriculture, logging, and wood processing. There are several economically significant industrial facilities in the region. Their branches include nuclear power energy as well as oil and gas, chemical, electrotechnical, and radio-technical industries.

The oil and gas industry in the region is considered in demand, although oil production in the Tomsk region has decreased by 8.16% - from 9.8 million tons in 2018 to 9 million tons in 2019. According to forecasts, in 2025 oil production in the region could fall to 5 million tons a year due to the reduction of explored oil reserves,

[24] In this paper the words *region* and *oblast'* are used interchangeably.
[25] The statistics: https://tmsk.gks.ru/

which is economically profitable to extract.[26] Tomskneftekhim LLC [27] is a major petrochemical producer in Tomsk.

There is a range of environmental issues in the region. The waste management system is failing, intense pollution of the atmosphere and water objects persists, and natural resources are used inefficiently. The pollution of the atmosphere, water surface, and soil is mainly caused by oil and gas enterprises and nuclear power production. Moreover, inadequate waste disposal by certain factories also constitutes a serious threat. Soil fertility is significantly reduced, deforestation intensifies, and biodiversity is declining.

One of the recent issues started a few years ago. Every summer in Tomsk, the smell of organic waste[28] intensifies. It is hard to say when this smell started, but it usually gets worse during periods of heat and whenever east or northeast winds blow across the city. A large number of complaints about unpleasant odors are recorded annually. The locals tried to detect the source of the smell but failed. In summer 2018, after the smell intensified, this issue became public. The Regional Committee for Environmental Protection and Nature Management (*Oblastnoi komitet okhrany okruzhaiushchei sredy i prirodopol'zovaniia* or *Oblkomprirody*) confirmed the complaints again in 2020, but once again it was impossible to identify the source of the odor since the pollution indicators were not exceeded.

The department of state land supervision of The Federal Service for Veterinary and Phytosanitary Supervision (Rossel'khoznadzor) conducted an unscheduled field inspection of *Prompererabotka company*, which provides waste disposal services to the Siberian Agrarian Group (*Sibirskaia Agrarnaia Gruppa* or SAG) meat-processing plant and poultry farm. It turned out that the company had polluted some 11.6 hectares of fields near Tomsk with pig and chicken manure. According to Rossel'khoznadzor, the content of organic matter, mobile phosphorus, and potassium is very high, while the gross content of zinc and arsenic (chemical pollutants of hazard class 1) and nitrates exceeds the values of maximum allowable concentrations. Furthermore, contamination with coliform bacteria, Enterococci,

[26]More about the statistics: https://neftegaz.ru/news/dobycha/524243-dobycha-nefti-v-tomskoy-oblasti-prodolzhaet-snizhatsya-no-rost-obemov-grr-pozvolit-perelomit-etot-tr/

[27] It is a subsidiary of SIBUR Holding, the largest integrated petrochemicals company in Russia.

[28] The chronology of the issue may be found in the local media: https://news.vtomske.ru/story/124-zlovonie-v-tomske

geohelminth eggs, and preimaginal forms of synanthropic flies was detected.[29] The management of SAG admitted[30] that the odor that has settled in the city comes, among other sources, from their enterprise, particularly from a lake with wastewater that has been exploited for about 40 years. Environmentalists, scientists, and residents also searched for the source of the unpleasant odor, and it turned out that one of the key sources of unpleasant odors in Tomsk is the problem of sewage. So, the problem of smell in the Tomsk area is omnipresent and complex.

However, the waste problems in Tomsk do not end there. More than two years ago, after a change of the waste disposal provider responsible for solid municipal waste management, people complained about the lack of containers near their houses. As a result, piles of garbage began to emerge on the streets of the city. After that, a "waste reform" was introduced. There are eight zones in the region, and there are assigned providers who will collect, sort, and bury waste and send recyclables out for further processing. Waste-sorting complexes are supposed to appear. Except for common subbotniks,[31] recycling is also gaining popularity among locals.

In recent years, another issue has been accelerating. In total, about 5 million hectares of forest have been leased to timber companies in the Tomsk region, and up to 50% have been taken for long-term development by companies from China. In every rural area, there are illegal logging activities carried out by the local population. Such cases of illegal logging are difficult to detect. Due to poor oversight, the forest in the Tomsk region is becoming a non-renewable resource. Huge areas of the taiga, when not properly controlled, are disposed towards illegal logging, including sanitary logging, which operates under the guise of forest management but instead of the sick forest the healthy forest is cut down.[32]

Today, the fauna in the region is represented by 326 bird species, 62 mammal species, 6 amphibian species, and 4 reptile species. There are 28 species of game animals (elk, deer, brown bears, lynx, etc.) and 38 species of game birds in the region. The rivers and lakes are inhabited by 33 fish species, 14 of which are

[29]The news portal: https://news.vtomske.ru/news/159912-rosselhoznadzor-v-letnem-zlovonii-vinovaty-ne-tolko-tomskie-proizvoditeli

[30]Interview with Andrei Tiutiushev: https://tv2.today/Istorii/Andrey-tyutyushev-o-zapahah-v-tomske-polze-sankciy-i-proekte-blagoustroystva-buff-sada

[31] Voluntary cleaning of territories (emerged in the Soviet Union).

[32]More about logging: https://tv2.today/Istorii/Chem-dalshe-v-les-chey-topor-stuchit-v-sibiri-strashny-li-kitaycy-i-chto-ot-nashego-lesa-poluchaem-my

commercially important. Rapid economic development of the region has changed the state of the rich biodiversity in the region. It altered habitats of many animal and plant species and has endangered some of them. Moreover, poaching has led significantly to the extinction of animal species. Some common types of poaching are fishing (mostly sturgeon and sterlet) and hunting for rare birds and animals by VIP hunting.

The degradation of natural complexes is fostered by irrational exploitation of natural resources. The evaluation and analysis of the environmental state is conducted on governmental as well as nongovernmental level. The results differ in some respects, mainly in the nuclear power issue, which will be demonstrated in the fifth chapter.

4.2 Nuclear Power Issues in the Tomsk Region

4.2.1 History and Structure of the Siberian Chemical Combine

Nuclear power did not spare my hometown either. There is one[33] nuclear power complex in the Tomsk region. Currently, it operates for industrial use; however, the shutdown of the last nuclear reactors used for military purposes did not succeed until 2008.

In 1949, the radio station "Voice of America" announced, through a jammer, the building of a nuclear power plant near the village *Belaia Boroda*, close to Tomsk. The ancient village of Beloborodovo, which stood on the steep bank of the Tom River, forever disappeared from the geographic maps. The Soviet government built the world's largest nuclear production facility on this site - the *Siberian Chemical Combine*[34] (Sibirskii Khimicheskii Kombinat) (Koniashkin, 1994, p. 4). Seversk,[35] previously known by its code name Tomsk-7, Combine 816, or Post Office Box 5 (*Pochtovyi*), is located approximately 15 kilometers northwest of Tomsk. The SCC production began in 1948, and in 1958 the facility was put into operation. According

[33] Another nuclear research reactor was put into operation at Tomsk Polytechnic University in 1967.

[34] Сибирский Химический Комбинат, literally translated as *Siberian Chemical Combine*, is often translated as *Siberian Chemical Enterprises* or *Siberian Chemical Plant*. For the sake of coherence, I use *Siberian Chemical Combine* or its abbreviation *SCC*. Since 2009, the SCC is a part of the TVEL Fuel Company managed by the ROSATOM State Corporation. Since 2014, the SCC is a joint-stock company.

[35] Seversk is still a closed town and the center of the eponymous closed administrative-territorial formation (Zakrytoe administrativno-territorial′noe obrazovanie or ZATO). It also includes five villages: Samus', Semiozerki, Orlovka, Chernil'shchikovo and Kizhirovo.

to Koniashkin, the first publications in the press about the SCC appeared only in 1989 and describe it as follows:

> But the monolith of the totalitarian regime cracked deeply, and in 1989, 35 [according to official documents that would be 31, M. M.] years after the SCC was launched, the first publications appeared in the press. The full name of this enterprise is known to only a few of the staff, but it sounds like this: Siberian Lomonosov Chemical Combine of the Orders of Lenin and the October Revolution. [...] At the peak of the development of the nuclear complex in the USSR, there were 13 industrial reactors producing plutonium. Five of them operated in Tomsk-7, the same number in Chelyabinsk-40 and three in Krasnoyarsk-26. This makes it possible to conclude: The SCC is the largest enterprise in the industry. But according to several indicators it is the largest in the world. The combine includes a whole system of plants connected by a technological chain. This chain turns the SCC into a full-cycle enterprise (Appendix A: Excerpts from the digest *SKHK glazami zelenogo dvizhenia*).

The main goal of the SCC was to produce weapons-grade uranium and plutonium for nuclear warheads. Later, the reprocessing of spent nuclear fuel was included in production as well. The SCC had five production reactors, three of which were shut down between 1990 and 1992, with the last two being closed in 2008 (Kotov et al., 2020, p. 4). As of 2021, the SCC has four plants according to the official website of the nuclear complex: an Isotope separation plant, a Conversion plant, a Chemical and Metallurgical Plant, and a Radiochemical plant.

The isotope separation plant[36] is used for uranium enrichment and production of stable isotopes. The plant provides services to foreign companies for uranium enrichment in accordance with contracts and agreements. The Conversion plant[37] is used for the processing of uranium-containing products, including highly enriched uranium, and the production of hydrogen fluoride, fluorine, uranium oxides, and uranium hexafluoride. The chemical and metallurgical plant[38] is used for the utilization of special products and processing of highly enriched uranium from these products. It also includes the production of magnetic alloys, magnets and ultradispersed powders. The radiochemical plant[39] includes the reprocessing of irradiated uranium blocks to extract uranium and plutonium, the disposal of liquid

[36] The information about the plant is translated from the official website: http://atomsib.ru/struktura-kombinata/
The environmental report of 2019 mentions the production of enriched uranium hexafluoride.

[37] Ibid. The environmental report of 2019 mentions only the production of uranium hexafluoride for enrichment (conversion).

[38] Ibid. According to the environmental report of 2019, as part of efforts to decommission the plant, work is currently being performed to reprocess radioactive substances and fissile materials at the plant's plutonium and uranium production sites (p. 6).

[39] Ibid. The environmental report of 2019 mentions only the process of the refining purification of uranium feedstock. It seems like plutonium is no longer processed at the SCC.

radioactive waste, the refining purification (affinage) of imported feedstock from radioactive and stable impurities, and the conservation of surface radioactive repositories in order to improve the environmental situation of the region (*Struktura kombinata | AO "SKHK,"* n.d.).

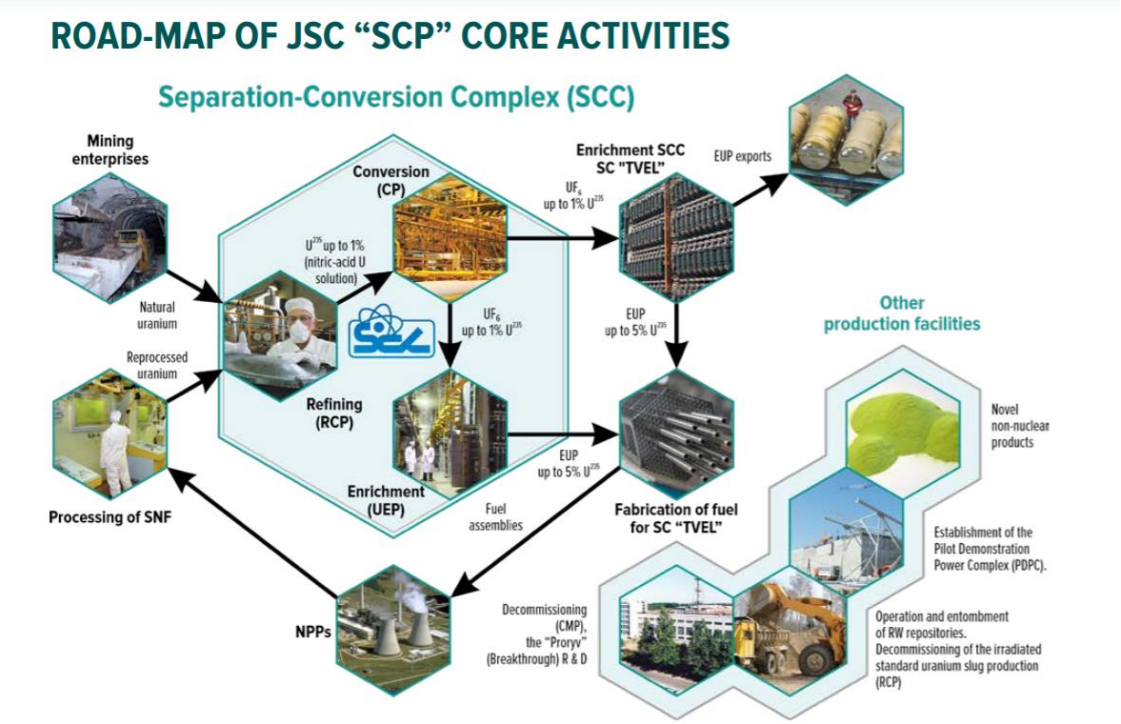

Figure 1. Road Map of SCC Core Activities. Source: Environmental Report (2020, p.5)

4.2.2 Reactions before and after the Accident

Operating the nuclear power complex in Seversk has not come without accidents. According to Aleksei Liakhov, a correspondent on Western Siberia for *Inzhenernaia Gazeta*, citing various newspapers, the explosion at the SCC was predicted by residents of Tomsk and neighboring cities. In his essay, he also describes his visit to the SCC, emphasizing the competence of nuclear power specialists and the safety of the plant. Nevertheless, Liakhov (1994, p. 19) notes that cooled water from the nuclear power plant flows through the Romashka River and is discharged into the Chernil'shchikovskaia channel of the Tom River.

However, Anatolii Striapshin (1994, pp. 23-25) who worked for 30 years as a senior foreman at one of the SCC objects, claims that violations at the SCC started already in the 1960s, as he witnessed all details of the work from the inside. His job

was to control inputs (incoming raw materials) and outputs (finished products and their discharge). He talks about violations and his futile attempts to report them to authorities:

> The nuclear materials of the SCC were deliberately understated and concealed by the management of the complex, under the knowledge of the ministry, the KGB, the City Committee and the Regional Committee of the Communist Party of the Soviet Union. Attempts to appeal to reasonableness were unsuccessful, and those who stood up for state interests were ruthlessly suppressed. [...] the plutonium leakage was due to irresponsibility and connivance. 1.5-3.0 kg of product per month was lost through a special sewer with sumph (waste) water. [...] the results of the inventory were falsified. That's why the management of the SCC and the Ministry stubbornly denied any operations, pretending that nothing had happened (all this was stored in the explanatory notes, acts of local and departmental commissions). It was something on the level of the mafia, as repeated appeals to the KGB [...], Prosecutor's Office and the Communist Party Central Committee practically remained ignored or solved narrowly at the level of faceless duds and excuses (Appendix A: Excerpts from the digest SKHK glazami zelenogo dvizhenia).

On April 6, 1993 at 12:58 p.m. on the premises of the SCC, an accident[40] occurred during the reprocessing of spent nuclear fuel. The news about this accident spread not immediately but exponentially all over the Tomsk region, then Russia, and then the whole world. It was covered by many media. Pogodaev (1993) presents reactions to the accident by local citizens and scientists, local government, the Russian government, and the international community. He cites the local newspapers *Krasnoe Znamia* and *Tomskii Vestnik,* comparing recent reactions and evaluations. The first mention of the accident in the Tomsk press appeared on April 8th. N.I. Kuzmenko, head of the Tomsk-7 administration reported (*Krasnoe Znamia*, 1993 as cited in Pogodaev):

> An equipment on one of the process lines was destroyed. Within the industrial site, where the equipment is located, the radioactivity is 20 times higher than the average norm. Outside the site, in Tomsk-7, there is no increase in the normal background radioactivity. There were no casualties in the explosion, the personnel are being examined. The cause of the explosion was a technical disturbance. The production of the line was stopped and now being recovered.

However, the spread of information by various representatives of the SCC differed. According to the director of the SCC, Khandorin, the destroyed unit contained 500 grams of plutonium. This information was opposed by the director of the Radiochemical Plant, Korotkevich, who claimed in his interview to American

[40] According to the International Atomic Energy Agency, "overpressure occurred in a tank containing uranium nitrate solution and caused gases to burst through the top of the tank, displacing the cover of the containment cell and leading to a forceful explosion. Release of radioactive materials to the local environment took place through the large holes in the side walls and roof of the room and through the side wall of the galley. There was also a release via a ventilation system through a 150 m high stack" (IAEA 1998, p.2).

journalists from *CNN* and *Reuters* that, "Most likely there was no plutonium release." It was soon revealed that even though the accident was localized within the site, there was a release of aerosols. Thus, the zone leading to Samus' was directly exposed to the higher level of radiation (Pogodaev, 1993).

Representatives of the local press also accused central radio and television of being biased in their coverage of what was happening in Tomsk-7. Reuters and CNN were the first to attempt to make an unbiased report.[41] At first, their request to go to the site where the accident occurred was refused. But after appealing to the head of the state commission, the foreign correspondents were given such an opportunity. In their videos, the foreign correspondents emphasized the calm behavior of the residents of Tomsk-7 and the absence of panic (*Krasnoe Znamia*, 14.04.93 as cited in Pogodaev, 1993).

Greenpeace also conducted independent research in the region. They concluded that due to the possible loss of government support and lucrative contracts with Western companies, the Ministry of Atomic Energy (*Minatom*[42]) and other stakeholders decided to conceal the actual results related to the accident. Moreover, the Greenpeace activists stated that the SCC was enriching spent uranium for the French firm *COGEMA*[43] because the process was considered too dangerous by French standards to carry out at home. Minatom was hopeful that such lucrative contracts would be awarded in the future (Ibid.).

The international media reacted[44] as well, reporting that no increase in radiation levels had been detected according to the Russian officials. However, John Hallam, spokesperson for the antinuclear groups Friends of the Earth and Movement Against Uranium Mining, when referring to Russian green groups stated that the accident on the Tomsk-7 plant was not a 3 on the international nuclear event scale (INES)[45], as earlier claimed by the officials, but at least a 5. The Chernobyl accident was a 6 [It is now confirmed as a 7, M.M.]. Hallam claimed that a central issue not plainly detailed was that plutonium, not simply uranium, was released in the accident (Green Left, 1993).

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[41] I was not able to find the original reports of CNN and Reuters.

[42] Now Rosatom.

[43] Now *Orano Cycle.*

[44] cf. the articles: https://www.newscientist.com/article/mg13818690-700-shades-of-chernobyl-stalk-tomsk/ and https://www.washingtonpost.com/archive/opinions/1993/04/08/the-explosion-at-tomsk-7/451ffc1b-bdb5-4dff-8eef-49d4a6e6cbce/

[45] 7 is a major accident, 6 is a serious accident, and 5 is an accident with wider consequences https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale

The analyzed material demonstrates an obvious informational confrontation between the SCC, the local and national media, and ecologists.

4.2.3 Environmental and Health Impact

Despite the fact that the analysis of the environmental and health impacts of the 1993 accident has been conducted many times, both immediately after the accident and during the following years, experts, scientists, and activists have not come to a consensus. A large amount of analyzed material confirms this. The radioactive contamination of the region is present; the only question is, what has influenced it? Is it the 1993 accident or the rest of the SCC's operations? Below are opinions and analyses from various sources, including scientists, the SCC representatives, the International Atomic Energy Agency (IAEA), and activists.

Koniashkin and Boltachev (1994, p. 5) noted that radioactive inert gases and long-lived radioactive aerosols of iodine, uranium, cesium, strontium, plutonium, and other components were being released into the atmosphere. They also emphasized that before the shutdown of the direct-flow reactors in 1990, discharges of radionuclides into the Tom River were much more significant. But despite the closure of these reactors, the discharge of radioactive effluents into the Tom River continued until October 1993. This was confirmed by the aerial expedition at that time (Rikhvanov, 1994, p. 11).

The IAEA was requested by the Government of the Russian Federation to assist[46] in assessing the consequences of the accident, including radiological health and environmental impacts. The specialists took samples of soil, vegetation, and snow within the contaminated area and visited the nearby village Georgievka. The results were later discussed with the authorities of the SCC and followed by a briefing with the local authorities including a press conference with the local, national, and international media representatives and members of the public (cf. IAEA 1998, pp. 1-2). According to the IAEA analysis, no high-range impacts were detected. Partially because of the wind direction, the level of radiation was low. The mission team noted, however, that the radiation protection laboratories at the SCC

[46] The IAEA mission visited the area on April 15-16, 1993.

were poorly equipped and had some old equipment, including spectrometers (Ibid, pp. 2-3).

After that, the IAEA commissioned a team of Russian scientists in order to assess the accident and get a full picture. They claim that since 1993, "the releases have been below the permissible threshold values," which was the result of upgrading the complex and closing some reactors and production lines (Ibid, p. 13). The IAEA continues with the analysis of the contaminated area (p. 53-60):

> Much of the area contaminated by radionuclides from the accident is outside the SCE[47] site, with some of the contamination affecting the village of Georgievka and to a much lesser extent the nearby village of Naumovka. A considerable area of agricultural land was also affected by fallout from the accident, as well as large areas of forest and countryside not used for cultivation or rearing animals. A 3 km length of the main road running from Tomsk to Samus was also affected. […] Less than 10% of the plutonium contamination could be traced to the release, again indicating that the major part was due to long term activities at SCE. […] the activity concentrations of the food consumed by the inhabitants of Georgievka were regularly monitored by CSSES. […] the activity concentration of gamma emitting radionuclides from the accident was lower than the sensitivity threshold of the measuring equipment. […] Decontamination of the area started on 13 April, while a blanket of snow was still on the ground, and continued until the end of July. […] In the first days after the accident all seven children under school age were taken away from the village to stay with relatives. The relocation of the other children was organized by the authorities and carried out on a voluntary basis. […] During their absence, the children were offered the chance to stay at sanatoriums and rest homes in the Tomsk region if health reasons justified it and to go on free long term excursions.

According to findings, they assume a minor radioactive dose was found in locals. However, they admit that there are some unclarified points which have never been resolved:

> In the case of the accident at SCE there remain some unclarified points, although minor, from which lessons could very well have been learnt. Unfortunately it is probably too late to find answers to these outstanding points and therefore valuable information may well have been lost.

Several experts have expressed doubts about the environmental footprint in the area of Tomsk-7. Despite the fact that the 1993 accident did not cause much radioactive contamination according to official data, there are other scientific opinions on the subject. For example, Alexey Yablokov, a well-known biologist and environmental safety expert, said in an interview (Parfenova, 1996, p. 46) that a thousandfold increase of any component in nature cannot be harmless. And he adds: "we let the atomic jinn out of the bottle and now we don't know how to put it back

[47] The abbreviation of the SCC by IAEA.

in."[48] Yablokov was also chairman of the Interdepartmental Commission for Environmental Safety at the Security Council of the Russian Federation, which checked the radiological and environmental safety of the SCC and adjacent territories at the request of the Tomsk Oblast administration in 1994 (Rikhvanov, 1997, p.203). This working group concluded that SCC emissions and effluents have a certain impact on the state of the environment and health of the population. There is a zone of increased radioactive contamination of the environment around the SCC, and the environmental situation in Tomsk Oblast as a whole is not favorable (Ibid, p. 204). In addition, work of the SCC affects the state of biota. Populations of some plant and animal species show morphogenetic changes, as well as disorders of reproduction.

In addition to the environmental impact, nuclear power is tremendously dangerous for humans. Irrespective of what the defenders of nuclear power say, the consequences of radiation exposure are calamitous. This confirms the previous findings of the scientists in Tomsk. A preliminary report on the results of studies on the impact of the SCC on public health prepared by scientists in the field of medicine and biology dated December 3, 1993, shows the negative impact of the SCC on human health in the Tomsk region. They conducted genetic, immunological, biochemical, and clinical studies in a large group of the population.

The results demonstrate a gradual increase of leukopenia and lymphocytosis in both healthy patients and patients with bronchopulmonary pathology. They also show an increase of astheno-vegetative syndrome and memory disorders in the general population. In addition to this and many other diseases, there is the presence of a 100% incidence of somatic diseases in children in the radioactive zone (Matkovskaia et al., 1994, p. 34). The digest *SKHK glazami zelenogo dvizheniia* represents not only scientific evidence of the danger of the SCC but also real stories of the eyewitnesses. Many workers did not know about the real danger and died young. One such story from a journalist and public figure, Irina Zhilavskaia (1994, pp. 29-31) from Seversk, published in the newspaper *Tomskii Vestnik* (03.06.1993), represents the atrocious reality of the SCC:

> In 1951, my parents were "recruited" to work at a secret plant under construction in Siberia and came to Tomsk-7. Here they worked at one of the "dirtiest" facilities until their retirement. One day my mother barely managed to get my father to a Moscow clinic - an occupational disease and six months of intensive medical treatment. In the end - disability. Not many of the demobilized guys that a quarter century ago, together

[48] Мы выпустили атомного джинна из бутылки и теперь не знаем, как обратно его загнать.

> with my husband, now also an employee of the Siberian Chemical Combine, arrived at the *Pochtovyi* survived. Some died of cancer, some died of a sudden brain hemorrhage. There were some who took their own lives. I look at my children worried: what will happen to them? [...] Before Chernobyl it was like workers at uranium and plutonium reprocessing plants didn't exist, who were exposed to radiation for long periods of time and got chronic radiation sickness as a result. [...] One day we went to the city cemetery. My husband started paying attention to the fresh graves of his co-workers, workers of the combine. They can be recognized by the monuments made of high-quality stainless steel. They are of solid quality and have the same shape. They are made at the SCC. And suddenly ... Our cemetery, like a randomly opened book, uncovered a carefully concealed departmental secret. Everywhere the monuments from the combine gleamed with cold steel light. We began to count the lifespan of our countrymen: 59 years, 41, 64, 60, 38, 47, 49, 54, 39, 51... Volunteers, Komsomol hearts (Appendix A: Excerpts from the digest SKHK glazami zelenogo dvizhenia).

The village Georgievka that lies in close proximity to the nuclear facility suffered the most from the accident. The village Naumovka was also recognized as a post-accident disaster area. Before the accident, there were 52 residents in Georgievka, including 11 children. Families with children left Georgievka almost immediately after the accident and moved to the neighboring village of Naumovka. Only a small portion of the residents who had nowhere else to go became plaintiffs. In 1995, 22 people, mostly pensioners, stayed there. Over seven years, while the case was slowly being considered by the courts, some of the plaintiffs died and some left Georgievka. The residents of both villages filed lawsuits against the SCC. The first lawsuit from 25 residents of Georgievka was filed in December 1995.

It claimed that the accident at the SCC caused radioactive contamination of the area, including their homestead, and was a severe moral trauma for them. Moreover, the plaintiffs demanded the termination of deep burial of liquid radioactive waste by the SCC. The financial compensation was approved; however, the court allowed the SCC to continue the burial of liquid radioactive waste. Both parties stated their disagreement with the court decision.[49] The residents of Naumovka were trying to get compensation from the SCC from 1997 to 2002 for contamination and harm to their health caused by the accident. The courts refused to consider their lawsuits.

In 2008, the European Court of Human Rights in Strasbourg ordered the Russian Federation to pay 58,000 euros in compensation for moral damages to 29 residents of Naumovka for the extremely long processing time of their lawsuits against the SCC.[50]

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[49] The complete timeline: https://bellona.ru/2003/03/24/sibirskij-himkombinat-prodolzhaet-za/

[50] More about the lawsuit: https://lenta.ru/news/2008/04/30/naumovka

Ilyinskikh et al. (cf., 1995) conducted a medical analysis of the residents of the villages of Naumovka, Georgievka, Samus', and Chernaia Rechka, all of which are adjacent to the nuclear plant. They concluded that the Samus' village has a gradual and prolonged mutagenic contamination of the area, while in the Chernaia Rechka and Naumovka villages the residents may have been exposed to a single powerful mutagenic factor. The authors stated that most residents of these villages have either endocrine or urinary system diseases, as well as abnormal hematological and immunological parameters (Ibid, p. 77). In addition, they noted that the number of cytogenetically altered peripheral blood cells in the residents of the surveyed settlements is comparable with the level of similar changes observed in the liquidators of the Chernobyl accident and residents of the Uglovsky district of Altai Krai, located near the Semipalatinsk nuclear test site (Ibid, pp. 24-25).

This was not the only accident on the premises of the SCC. As of 2021, the official website of the SCC does not mention any of them. Different sources claim different numbers of accidents. According to Toropov (2010, p. 7), during more than fifty years of its operation, the SCC has had over 30 accidents, five of which, including the accident of April 6, 1993, are classified as Level 3 on the INES scale and are classified as serious accidents. Environmental activists from Tomsk (Dvizhenie "Ėkologicheskaia Initsiativa," 1996a, p. 4) claimed that there had already been 36 accidents, including four similar to the accident in 1993.

4.2.4 Radioactive waste and other projects

Apart from this accident, there are other issues nowadays that raise concern. The SCC is still an active nuclear plant. Moreover, foreign nuclear waste is being stored in that area, even though concerns about radioactive waste in Seversk had already been raised before the explosion in 1993. The commercial bargain has been an ongoing issue for over two decades. The deal in 1991 was to enrich French radioactive raw materials (uranium) at the premises of the SCC and then transport them back to France.

According to Lupandin[51] and Popova (1991, pp. 46-49), environmental and public organizations from Tomsk requested an arrangement of independent radioecological investigations in the Tomsk region. These investigations were held by several Soviet and French physicians with the assistance of local organizations and citizens. The goal of these investigations was to state the purpose of the bargain, the danger of such an action, and the quantity of nuclear waste. As the results showed, even though France possesses one of the most powerful nuclear energies in the world and has its own radiochemical industry on reprocessing nuclear waste, it is not as powerful as the one in Tomsk-7. The danger of such a process is obvious. Firstly, the technology of uranium enrichment increases the concentration of U-232,[52] which is the most "poisonous" isotope, especially for those who work with it. Thus, special protection and work conditions are necessary.

Lupandin and Popova emphasize the danger to which the environment of Tomsk Oblast and the entire Ob River basin, including the Arctic Ocean, will be exposed. Secondly, the transportation process from France to Seversk and back to France is a priori connected with possible railway incidents, where the risk is "very high in our country at the present day." The authors estimate the radioactive situation of the rivers in the Tomsk region, comparing it to the Techa river in Chelyabinsk and Kurgan, where highly radioactive waste has been dumped in the river for years. And the radioactive contamination of the *Mayak* nuclear power plant has gone beyond the scope of a national problem and has become a global one. Therefore, since *Mayak* and SCC belong to the same ministry, it is likely that the same radioactive waste management was practiced in Tomsk-7 as in the Chelyabinsk Region.

Furthermore, the radioecological expedition in Samus' near Tomsk, organized in the summer of 1990, confirmed that the SCC continuously discharged liquid radioactive waste into natural water bodies, including the Tom River. Two dangerous processes - corrosion of metal structures of nuclear production and leakage of radioactivity from the reactor - were also detected (Ibid).

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[51] Lupandin uses the pseudonym Glebov-Obedov in this journal. The article can also be found in the English translation "Nuclear bombs of slowed action in the Siberian bogs" at the Hoover Institution Archives, in the section of Francis Underhill Macy papers (1983-2007), Box 6, File 9.

[52] Uranium-232 is an isotope of uranium that cannot be found in natural uranium. Uranium enrichment is a complex process. Since this paper is not focused on physics and does not aim to explain all the physical processes, I rely on the opinion and research of other scientists who specialize in this area. More information about the uranium radiation properties may be found here: https://www.wise-uranium.org/rup.html

International awareness regarding the nuclear waste issue grew after the accident at the SCC. As advocated by Broad (1994) in the New York Times:

> The largest injections apparently took place at Tomsk, a sprawling nuclear complex. A Russian paper said they amounted to 30 million cubic meters, or about 8 billion gallons. […] In 1993, a group known as the Tomsk Ecological Initiative, based near one of the Siberian injection sites, said that major faults there were sending radioactive waste up toward surface waters, posing a grave "threat of contamination."

Cochran et al. (1995, 114) state that even after the massive accident in 1993, the SCC still produced plutonium pits for weapons in 1994. Moreover, the facility had around "23,000 containers with fissile materials from weapons" being stored.

Koniashkin and Boltachev (1994, p. 7) did not disregard the topic of radioactive waste either. As of 1994, there were 50 storage facilities for liquid and solid radioactive waste located on the territory of the SCC. In the process of their operation, the industrial site and the sanitary protection zone of the SCC are contaminated, and it later goes to the groundwater.

Another issue in Seversk is the construction of a new nuclear power plant. Talks about a new MOX[53]-production plant project began around 2003. The nuclear specialists presented this program as a no-alternative, safe, and very profitable project. According to Toropov (2005, p. 18), the United States was concerned about finding affordable sources of nuclear fuel and was ready to allocate $200 million to finance the Russian MOX program. He also highlights that the main environmental hazard of such fuel production is the nature of plutonium. It is one of the most dangerous radioactive substances for humans.

The radiation hazard of plutonium-239[54] is associated with its alpha activity, whose specific value is about 200 thousand times higher than that of another alpha emitter - Uranium-238. The half-life of Pu-239 is 24,000 years. In addition, even a minuscule amount of Pu-239 can cause the most severe and even fatal injuries to a living organism. With such a half-life, Pu-239 will almost completely disappear from the contaminated territory and biological objects only after 10 half-lives, that is, in

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[53] MOX (mixed oxide fuel) is a "type of nuclear reactor fuel that contains plutonium oxide mixed with either natural or depleted uranium oxide, in ceramic pellet form. (This differs from conventional nuclear fuel, which is made of pure uranium oxide.) Using plutonium reduces the amount of highly enriched uranium needed to produce a controlled reaction in commercial light-water reactors. However, plutonium exists only in trace amounts in nature and, therefore, must be produced by neutron irradiation of uranium-238 or obtained from other manufactured sources"(NRC, 2020).

[54] Pu-239

240,000 years. When it decays, it will turn into uranium-235, which has a half-life of about 700 million years. But the natural environment around the SCC has already accumulated a significant amount of plutonium over many years of its operations. Toropov (2005, 23) also adds that MOX-fueled reactors have an increased risk of danger. In addition, the main disadvantage of locating such a reactor at the SCC is the direct proximity to the city of Tomsk.

As of 2021, a new project called Ecotechnopark (*Ėkotekhnopark*) by Rosatom's subsidiary Federal environmental operator (*FGUP Federal'nyi ėkologicheskii operator*) might be built near Seversk. *Ėkotekhnopark* would be a complex for recycling not nuclear and radioactive waste but other industrial waste from Tomsk Oblast and neighboring regions. The citizens of Seversk are worried about a huge amount of hazardous waste being stored and recycled in close proximity to their home. Some locals participated in a flash mob called "Siberia is not a dump" (*Sibir' ne pomoika*) as they were not allowed to visit the hearing for the project.[55]

The latest issue is the construction of a lead-cooled fast reactor at the SCC premises - *BREST-OD-300*. The Rosatom project is called "Breakthrough" (*proryv*) and is presented by corporations and the media as a unique and one of the world's major nuclear power projects. After ten years of deliberations, in February 2021 the Federal Environmental, Industrial and Nuclear Supervision Service (*Federal'naia sluzhba po ėkologicheskomu, tekhnologicheskomu i atomnomu nadzoru* or *Rostekhnadzor*) issued the reactor construction license to the SCC. According to the project representatives, the reactor is of inherent safety, which excludes accidents at nuclear power plants and nuclear fuel cycle facilities that require evacuation, and especially resettlement of the population. It also claims environmental safety and technological support for the nonproliferation regime.[56]

All of the above-mentioned issues and their impact on the environment and humans are more complex from a scientific point of view. Nevertheless, they underscore the dangers faced by the local residents. After all, the Siberian Chemical Combine has been located in the immediate vicinity of several hundred thousand people for over 60 years.

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[55]https://tv2.today/News/My-ne-svalka-tomichi-protiv-ekotehnoparka-v-severske-gde-budut-razmeshchat-opasnye-othody

[56] More about the project: https://www.kommersant.ru/doc/3952336

5 Environmental Initiatives and Solutions in the Tomsk Region

5.1 Governmental Level

5.1.1 Overview of the Governmental Initiatives

Tomsk has always been known for its scientists and innovations. It was not without the influence of scientists and environmental initiatives of the Tomsk State University that the state system of nature protection in the Tomsk region was formed. However, it goes back to the All-Russian Society for the Protection of Nature (VOOP[57]), mentioned in the third chapter. The VOOP had its branches in many cities across the country.

The Tomsk Regional Branch was established in 1946 (Laptev, 1970, p. 145). In 1963, the People's University of Knowledge of Nature was founded in Tomsk, which was the first university of its kind in the country. Its rector was the deputy chairman of the Presidium of the Tomsk Branch of the VOOP, Professor I.P. Laptev. By 1970, the work on nature protection in the Tomsk region was being headed by the Regional Council of the VOOP and 19 district councils, which led the work of more than 700 primary organizations of the Society in universities, technical colleges and schools, and enterprises. The Society had over 102,000 members.

The regional and district councils of the Society had 10 sections: protection of atmospheric air, water protection, soil protection, forest protection, landscaping, gardening, beekeeping, and animal protection. The work of the Tomsk branch was mainly aimed at establishing a public inspection, investigating the condition and ways of nature protection in each district. Moreover, it included identification of unused natural resources and including them in economic use in compliance with all necessary measures for their protection. Every year in the region, their activities were held that were intended to prevent poaching, violation of fishing and hunting rules, and forest fires and floods (Ibid, pp. 145-149).

The state system of legislative and executive power in the field of environmental protection in the Tomsk region has changed its name and functions over time depending on external and internal political events, changes in the governing power in the country, domestic reforms, international relations, economic

[57] As of 2021, the VOOP is positioning itself as a public and cultural-educational environmental organization but is supported by the government of the Russian Federation. There is no regional branch in Tomsk anymore.

development, scientific discoveries and research, and public perceptions and demands. In the period from 1987 to the present, environmental protection and ecological safety at the state level in Tomsk Oblast was represented by the executive bodies of the regional government, several regional departments of state agencies, and public organizations.

All the decrees and laws in the Tomsk region developed in compliance with the national legislation. Despite the active rulemaking, there were many contradictions and inconsistencies between the regional legislation and the Russian law on environmental protection.

In 1995, by the Decree[58] of the Governor of the Tomsk Region, the Regional Coordinating Environmental Council of the Tomsk Region Administration was established, which included heads and specialists of all interested departments and committees, representatives of the SCC, Tomsk Polytechnic University, and later the Tomsk Environmental Student Inspection named after Lev Blinov (*Tomskaia ėkologicheskaia studencheskaia inspektaiia imeni L'va Blinova* or *TĖSI*[59]*)*. The Council considered and prepared proposals and coordinated the activities of the executive authorities of the region for joint environmental protection activities and the implementation of major environmental programs of federal and regional importance, as well as the rational use of natural resources. The council was abolished in 2002; however, it still exists in some districts.

Executive bodies of state power of Tomsk Oblast responsible for state administration in the field of environmental protection (departments, committees, expert councils, commissions) participate in the implementation of federal policy in the field of environmental development of the Russian Federation in Tomsk Oblast, control the execution of adopted laws of Tomsk Oblast, and regulate legal acts of Tomsk Oblast Administration and the Governor of Tomsk Oblast in the field of environmental protection. Currently, there are several departments that are responsible for different environmental issues.

Since 2003, the Department of Natural Resources and Environmental Protection (*Departament prirodnykh resursov i okhrany okruzhaiushchei sredy*) has operated within the Administration of Tomsk Oblast. Collaboration with scientists

[58] The decree of April 13, 1995, No. 101 “On the Regional Coordinating Environmental Council” (Ob oblastnom koordinatsionnom ėkologicheskom sovete): https://docs.cntd.ru/document/951806041
[59] This NGO will be discussed in the next subchapter.

from local universities allowed for the development of the concept of environmental protection, to form a system of specially protected areas and zakazniks of the Tomsk region. The Department also develops strategic planning documents of Tomsk Oblast in the sphere of environmental protection and natural resource management. Moreover, the department develops drafts of legal acts and carries out state environmental supervision of compliance with legislation in various areas. These are environmental protection; protection of atmospheric air; waste management; use and protection of water bodies in the Tomsk Region; geological research; rational use and protection of subsoil with respect to subsoil areas of local significance; and protection and use of specially protected natural areas of regional significance.[60]

The department's subordinate organization is the Regional Committee for Environmental Protection and Nature Management (*OGBU «Oblkompriroda»).*[61] The main activities of the Committee are to organize and ensure the implementation of regional activities in the field of environmental protection; keeping records of objects and sources of negative impact on the environment; collecting and analyzing information, creating and maintaining electronic databases on the state of natural resources and the environment; maintaining the Tomsk Oblast Red Data Book; analytical support of radiation monitoring of the region; organizing the development of environmental education and environmental culture; and providing the public with reliable information on environmental conditions in Tomsk Oblast.

There is also the Department of Subsoil Use and Oil and Gas Development, the Department of Forestry, the Department of Hunting and Fisheries, and others. Seversk also has a similar institution - the Department of Environmental Protection and Natural Resources, which is responsible for a range of similar tasks (*Otdel okhrany okruzhaiushchei sredy i prirodnykh resursov*).[62]

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[60] https://depnature.tomsk.gov.ru/

[61] Cf. https://ogbu.green.tsu.ru/ The committee was established in 2000. No chronological documents have been found, but prior to the establishment of this committee and the Department in 2003, different committees operated from 1990 to 2000, including the Tomsk City Committee for Environmental Protection (Tomskii gorodskoi komitet po okhrane okruzhaiushchei sredy), the Regional Committee of Ecology and Natural Resources (Oblastnoi komitet ėkologii i prirodnykh resursov), and the State Committee of Ecology and Natural Resources of Tomsk Oblast (Gosudarstvennyi komitet ėkologii i prirodnykh resursov Tomskoi oblasti). Their chairman was Aleksandr Adam, who made a significant contribution to the development of the administrative structure in environmental questions.

[62]Their website: https://xn----7sbhlbh0a1awgee.xn--p1ai/divisions/front/division/id/62

Today, the administrative system on environmental questions is clearly distributed and fully subordinated to the federal law on environmental protection. The law of the Tomsk Region from July 10, 2007 (as amended on June 8, 2020) № 134-OZ "On Environmental Protection in the Tomsk Region" (*Ob okhrane okruzhaiushchei sredy v Tomskoi oblasti*) [63] was adopted by the State Duma of the Tomsk Region. The law regulates the division of authority of Tomsk Oblast government bodies in the field of environmental protection, determines directions and sources of financing environmental protection activities, and regulates other relations in the field of environmental protection on the territory of Tomsk Oblast.

Different executive bodies have their own obligations, which may overlap. Industrial enterprises in the territory of the Tomsk region are licensed by regional executive bodies in the field of the environment. But one license is not enough; it is necessary to get a comprehensive ecological permit, including the permit for industrial emissions. This permit is issued by the territorial body of the Federal Service for Supervision of Natural Resources (*Rosprirodnadzor*), while the Federal Environmental, Industrial and Nuclear Supervision Service (*Rostechnadzor*) monitors radioactive emissions. Subsequently, norms of maximum permissible emissions vary from region to region.

The enterprises have their own reports and monitoring, but they also must report to the authorities to which they are subordinated. The activities of enterprises have to be legally transparent, and the documents and reports are available on the official websites of the enterprises. However, violations of such an over-bureaucratic system can be punished with fines and even prosecution.

It can be concluded that the structure of the environmental policy in the Tomsk region (as well as in the whole country) has undergone a considerable restructuring during the analyzed time period. Despite the fact that the monitoring of enterprises is subjected to total control, it is hard to say whether this has led to a significant improvement of the environmental situation or not. The next subchapter discusses this with the example of nuclear power.

[63] https://docs.cntd.ru/document/951820730

5.1.2 Solutions in the Nuclear Power Field

Control over the radiation situation in the Tomsk region did not always exist. The main nuclear facility in the region, the Siberian Chemical Combine, was a secret facility for several decades and did not provide reliable information about its activity to the public until the early 1990s. From the very beginning of its foundation and up to now, the nuclear power complex has been an important strategic state object. However, it was only after the large-scale accident of 1993 and the growing public distrust that the governmental system of control over the radiation situation in the Tomsk region, and the SCC in particular, was formed through public efforts.

There are no official documents[64] of that time available in the public domain. However, Rikhvanov (1994) noted that the regulatory requirements for assessing the radiation situation in the SCC area did not provide a picture of its real state. Koniashkin and Boltachev (1994, p. 19) cite the data of the State nuclear supervision (*Gosatomnadzor*)[65] expertise in the aftermath of the 1993 accident, which testify to violations of the SCC management practices in handling medium and low-level radioactive wastes, as they contradict the Law on Environmental Protection of the Russian Federation.

At that time, the Regional Committee on Ecology and Natural Resources and the SCC were not subject to full-scale government control as they are today. Koniashkin (1994, p. 26) notes that prior to 1993, there were 23 emergency incidents at the SCC that were concealed not only from the public but also from the Regional Ecology Committee. It turned out that due to the absence of excessive emissions, no maps of pollution sites were prepared, and no special samples of atmospheric air were taken.

The management of the SCC then concluded that specialists from any independent organizations could conduct their own analyses of the plant's operations and draw their own conclusions about the degree of pollution in the area where the SCC is located (Ibid, p. 40). In addition, the interdepartmental commission for investigation of causes and development of measures to eliminate consequences of the accident at the radiochemical plant of the SCC in Tomsk-7 concluded that the radiation situation

[64] Cf. Koniashkin and Boltachev (1994) and the fragments of the materials by the Regional Committee on Ecology and Natural Resources.
[65] Now *Rostechnadzor*.

was recognized as not dangerous for living and vital activities of the population but required appropriate control (Ibid, p. 41).

From 1992 to 1993, the Research Institute of Biology and Biophysics conducted landscape-ecological research on the territory of Tomsk-7 under a contract with the City Committee on Ecology and Nature Management of Tomsk-7. At that time, the conducted research put this territory into the category of a tense ecological situation (L′vov & Dmitrieva, 1994, p. 27).

There was no well-established state environmental monitoring; it was just initially being developed at that time throughout the whole country (Adam, 1995, p. 123). Monitoring of radiation contamination of the environment was carried out mainly by the SCC and the Tomsk Center for Hydrometeorology and Environmental Monitoring. At that time, the state automatic radiation situation monitoring system (ASMRO[66]) was just being developed (Ibid, p. 124). Environmental safety was actively discussed both at the state and regional levels. The 1995 report (Adam, 1996, p. 173) also underscores that the existing regulatory documents do not meet the requirements of modern practice and remain imperfect and contradictory.

And the SCC remains the most potentially dangerous industrial facility in the region for the environment and the population. Soon the Federal Law of 21.11.1995 "On the use of atomic energy" (*Ob ispol'zovanii atomnoi ėnergii*) was adopted, which defined the legal basis and principles of regulation of relations arising during the use of nuclear energy, aimed at protecting human health and life, the environment, and property when using atomic energy and was designed to promote the development of atomic science and technology and to help strengthen the international regime of safe use of nuclear energy.

Moreover, in 1996 the Federal Law "on radiation safety of the population" (*O radiatsionnoi bezopasnosti naseleniia*) was introduced. The law defines the legal basis for ensuring radiation safety of the population in order to protect their health. The law uses such concepts as radiation safety, ionizing radiation, natural radiation background, man-made altered radiation background, effective dose, sanitary protection zone, observation zone, and radiation accident. According to this law,

[66] Currently, work continues on the operation and development of the Automated Radiation Situation Monitoring System (ASMRO TO). In 2019, from the regional budget to modernize the system.
The main purpose of creating ASMRO is to provide state authorities with operational information about the absence of radioactive releases in the 30-kilometer zone of the SCC. ASMRO TO was created from the funds allotted by the Russian Government for the liquidation of the consequences of the accident of 1993 (Koniashkin et.al., 2020).

every nuclear facility must have an action plan to protect employees and the public from a radiation accident and its consequences, in agreement with the local authorities. These federal laws, along with advances in the grassroots movement in Tomsk, have contributed to the development of structuring in the region.

The above-mentioned examples prove that the structure of control over the radiation situation had been forming for years. As of 2021, monitoring of the radiation situation and radioactive contamination of environmental objects is performed by regional, city, interregional, and federal institutions.

State environmental inspection is an integral part of the state environmental policy in Tomsk Oblast. State reports on the environmental condition and protection in the region are issued each year. The Department of Natural Resources and Environmental Protection together with *Oblkompriroda* are responsible for such supervision. For example, the report for 2019 concludes that the radiation situation in the region continued to gradually improve compared to previous years as a result of natural processes of self-purification of the natural environment from radioactive contamination, as well as the shutdown of all reactors at the SCC.

The organizations mostly comply with radiation safety norms and rules, and the identified violations did not lead to the exposure of personnel and population or environmental contamination. The content of radionuclides in drinking water, food products, and atmospheric air is well below the permissible concentrations. Radiation is not the leading factor of harmful impacts on the health of the population. Radionuclide contamination of soils in the area of SCC location is not dangerous (Koniashkin et.al., 2020). In addition, the vital issue of nuclear waste storage is covered in a vague way in the report. It mentions accounting and control of radioactive materials and radioactive waste in the organizations located in Tomsk region. In 2019, 1,242 sources of ionizing radiation were registered in 48 organizations, some of which are constantly in motion. The report does not indicate what this means for the environment. For comparison, the report[67] of the *Oblkompriroda* for 2011 presents almost identical conclusions about the radiation situation in Tomsk Oblast and its improvement.

Annual reports have the same structure and typical content. The reports analyzed in recent years show that the condition of the city of Seversk, for example,

[67] The report: https://ogbu.green.tsu.ru/wp-content/uploads/2017/02/obzor_2011_final_na_sayt.pdf

is satisfactory. This confirms the report by the Department of Environmental Protection and Natural Resources in Seversk (2020, pp. 26-31). The authors emphasize that the level of atmospheric air pollution is decreasing, water quality meets sanitary and epidemiological requirements, the radiation situation in the SCC area is stable and satisfactory, and the content of technogenic nuclides in the soil of the monitoring area is within the values corresponding to the global level. Moreover, environmental monitoring at the SCC is carried out on the initiative and with financial support from Rosatom. There is a clear positive assessment of their work: they emphasize that one of Rosatom's priorities at its nuclear facilities is to ensure the radiation safety of the population and, in particular, when new production facilities are put into operation.

We can conclude that in the 1990s, environmental policy was just taking shape both in Russia and in the Tomsk region. Regulations and laws contained many contradictions. Over time, this policy began to acquire structure and today it is an over-bureaucratized system, which all the environmental executive bodies and enterprises are obliged to obey. The Siberian Chemical Combine continues to operate and develop, and it is part of Rosatom's strategy which, in turn, is a state corporation. Environmental reports over the last decade, compared to those of 1994 and 1995, show an improvement in the radiation situation in the region. To understand whether this is due to real improvement of the situation and modernization of equipment and monitoring, or whether these reports are formal frames, it is necessary to conduct further research.

5.2 Non-Governmental Level

5.2.1 Emergence of the Environmental Movement in Tomsk

The most challenging part of the research was to find literature documenting the non-governmental level of bottom-up activities from the population. Some of the relevant sources in the electronic catalogue of the Tomsk Regional Universal Scientific Library were not available at the library. Nevertheless, the research demonstrates the tremendous activity of ordinary citizens and scientists in Tomsk in the 1990s. According to the findings, the first nongovernmental work started before

the collapse of the Soviet Union. The materials of the Scientific Conference on the Emergence of the Civil Society (*Stanovlenie grazhdanskogo obshchestva: vozmozhnosti, problemy, perspektivy (opyt Tomskoi oblasti*) of 1997 confirm this. In a speech on the role of non-governmental environmental movements in the formation of a civil society, Koniashkin (1997, p. 29) acknowledges that a civil society had not yet been established in Russia. However, from 1986 to 1993 the process of establishing the civil society was more active than in 1997.

The environmental movement played a huge role in this regard. However, he underlines the uncertainty in defining the emergence of the environmental movement in Russia. Ianitskii (as cited in Koniashkin, 1997, p. 30), claims that for almost a hundred years, the Russian intelligentsia had fought hard and unceasingly to protect nature. Koniashkin points out that the public environmental movement in Russia became widespread only in the late eighties, due to the declassification of official information, the same way as in the case of the anti-nuclear movements.

Before 1987, there was practically no official open information about the ecological situation and people's illness rate, and it is no accident that a "surge" of environmental protests, including demands to close a number of polluting factories, coincided with the appearance and spread of such information. That is when the informal environmental movement in Tomsk was born, as claimed by Koniashkin (Ibid, p. 31). From late 1987 to early 1988, a group[68] of engineers, creative intelligentsia, and scientists concerned with the environmental problems of the city was formed. The group was officially registered as the sixth section of the VOOP.

The main purpose of the formed movement was to oppose the implementation of the plans of the Ministry of Medical and Microbiological Industry of the USSR (*Ministerstvo meditsinskoi i mikrobiologicheskoi promyshlennosti SSSR*) to build a plant of protein-vitamin concentrates in Tomsk. However, the movement quickly acquired the character of a mass movement and encompassed a wide range of environmental and social problems in its sphere of interest. Within a short period of time, the movement established ties with similar groups in other regions and became a collective member of the *International Socio-Ecological*

[68] According to Nekrasov (1994, p. 59), also the local branch of the Union of Soviet Writers (Soiuz Sovetskikh Pisatelei).

Union[69] of the USSR or SEU (*Mezhdunarodnyi sotsial'no-ėkologicheskii soiuz*) in 1989 (Ibid, p. 31).

Koniashkin indicates that in 1987-1989, society was still totalitarian in many respects, and of all the forms of social movement, only the environmental movement was legalized. Many members of political parties and non-environmental public movements began their activities as members of the environmental movement. Glasnost was a step towards political protest actions, so the environmental movement at that time absorbed not only ecologists but all active members of society as well. Koniashkin (Ibid, p. 32) calls this period the time of ecological solidarity of Soviet society, although the motives and goals of the "ecological turn" were very different for different participants in this struggle. He also emphasizes that political activity is one form of community environmentalists' work.

In Tomsk, and in Russia in general, the political activity of environmentalists and *zelenye* peaked in 1989-1990. At that time, the movement was de facto divided into politicians and non-politicians. Some environmentalists enjoyed engaging in politics; others saw it as their civic duty. Still others were only willing to help those who engaged in politics on the environmental platform, while some tried to combine politics with membership in the movement. After failing in the elections, these people either returned to the movement or withdrew from environmental activism altogether. Finally, a separate group of *zelenye*, mostly represented by eco-anarchists[70], did not participate in the election campaign for ideological reasons.

It was during this period that almost all of the leaders of the sixth section of the VOOP in Tomsk quit their activities in the organization. Some of them became deputies of the regional and city councils, and those who were not elected as deputies left the movement. The revived efforts of the remaining activists changed not only the name to "Ecological Initiative" (*Èkologicheskaia Initsiativa)* but also the direction, from a multidisciplinary one to an anti-nuclear one. The forms of work

[69] The only international environmental organization founded in the USSR (1988). The main idea behind the creation of the organization was to gather under one roof people who care about what happens to the Earth, to its nature and culture, to its people, to our children, and grandchildren. The union included affiliated organizations from the current post-Soviet space. Later in 1991, the Russian Socio-Ecological Union was founded, consisting only of individual members and NGOs from Russia. However, some individuals are members of both organizations today. For the sake of simplicity, this thesis includes an interchangeable abbreviation of SEU.

[70] Koniashkin does not explain the term "eco-anarchists", however more about its meaning and history may be found in the article by eco-anarchist theorist John Clark: https://www.ecologicalcitizen.net/article.php?t=what-is-eco-anarchism

also changed; the emphasis was not on organizing mass actions but on constructive interaction with state regulatory agencies and authorities at various levels.

According to Koniashkin (Ibid, p. 33), the relationship of environmental organizations with other nongovernmental movements and political parties is not always straightforward. Often, these are problems of an economic nature. The Tomsk environmental movement had rather close relations with youth, women's organizations, and the scientific community, whose views and approaches to solving environmental problems more adequately reflect the views of environmental movements. Eco-activists act as intermediaries between scientists and the population. It is important for them to convey information to the public in order to encourage them to take action. And the polluter of the public environment must stop its activities or pay the compensation necessary to fully restore the polluted areas.

According to Galkin (as cited in Koniashkin, 1997, p. 34), a characteristic feature of new grassroots movements is their alternative orientation, expressed in attempts to go beyond traditional values – economic, political, and cultural – and to develop a new system of values. Meanwhile, the alternative nature of the environmental movement manifests itself in the rejection of the main idea of industrial society – mass industrial production, which is associated with all environmental problems. The first environmental NGO in Tomsk that began to build new values, such as coevolution of society and nature, adaptation of industry to the opportunities and limits of the biosphere, shifting economic priorities from consumption to conservation, and ecologization of people's consciousness, was *Èkologicheskaia Initsiativa*.[71]

5.2.2 Environmental NGOs and Key Actors

5.2.2.1 Èkologicheskaia Initsiativa

Èkologicheskaia Initsiativa expanded immediately after the ban on mentioning the SCC in the media was lifted and focused on analyzing the impact of the complex on the environment and human health. Its main goals were the examination of technical projects, the elimination of environmental illiteracy, control of the medical situation, and work with the media. According to Nekrasov (1994, p.

[71] Officially referred to as a public/social movement. According to Nekrasov (1994, p. 59), *Èkologicheskaia Initsiativa* was born in April 1988.

59), the first environmental demonstration took place the same year on June 1, 1988 and gathered around 1,500 people. He emphasizes that for the first time a grassroots movement organized an independent environmental expertise – a radiobiological investigation in the area adjacent to the SCC sanitary protection zone. In addition, Tomsk residents supported this action with donations. In 1991, the fact of increased radiation background in the area of SCC disposal of effluents was acknowledged for the first time on the governmental level.

In 1992, Èkologicheskaia Initsiativa launched a campaign against building a nuclear heating plant in Tomsk-7 that had no analogs in Russia. The campaign resulted in success. Shortly after, Minatom intended to build a federal storage facility for fissile material from dismantled nuclear warheads, and if it had not been for the international connections of the Tomsk *zelenye*, the issue would most likely have been resolved on the sidelines of Minatom (Ibid, p. 59). Another achievement of Èkologicheskaia Initsiativa was the establishment of the ecological special edition "GREEN SUMMARY" ("*ZELENAIA LETOPIS'*") in the newspaper of the Regional Council "People's Tribune" (*Narodnaia Tribuna*[72]*).* He underlines that this was an unprecedented case in Russia, when a group of *zelenye* was given its columns on a pro bono basis by a public political newspaper without censorship of any kind.

This was an excellent opportunity to promptly provide the general public with independent information about the plans of Minatom and the SCC. With the help of the SEU, *Èkologicheskaia Initsiativa* informed the population of the region about the actions of Minatom and the authorities on the issue of the storage facility and about possible alternative ways to locate it. Nekrasov adds that electronic mail helped them break the monopoly on information that used to be enjoyed by the nuclear industry. *Èkologicheskaia Initsiativa* conducted joint examinations with the SEU, which proved the pinpointed radioactive contamination in the village of Georgievka and demanded a comprehensive assessment of the radiation situation in the entire region (Ibid, p. 61).

Before the accident at the SCC in 1993, Boltachev (1994, p. 8) delivered a speech at a seminar on the social and environmental consequences of nuclear weapons production and testing in the former Soviet Union, listing facts of human and animal contamination with radionuclides – products of the SCC's activities. He

[72] Mass regional political newspaper of the post-perestroika period (1990-1996).

emphasizes that the long-standing authorities and organizations in Tomsk-7, which originally were supposed to take care of compliance with the sanitary protection zones, were obliged to educate the population about the dangers of staying in the area and of agricultural activities in the zones. Boltachev also expresses an axiom that calls into question the work of official structures:

> […] I came here to say something that no official would tell you today. In a country of paradoxes, we are used to people who, by their duty and rank, are supposed to protect people's health, go out of their way to protect the interests of the nuclear authorities (Appendix A: Excerpts from the digest SKHK glazami zelenogo dvizhenia).

As the environmental movement was developing, especially following the success of the *Èkologicheskaia Initsiativa*, other NGOs were also established. In 1993, the grassroots "Committee for Radiation Safety" (*Komitet radiatsionnoi bezopasnosti*) was formed in Tomsk, followed in March 1994 by the movement "For the Environmental Safety of Siberia" (*Za ėkologicheskuiu bezopasnost' Sibiri*) (62). Neither of these organizations exist now.

Many sources confirm that the *Èkologicheskaia Initsiativa* activists were engaged in international conferences and events. The archives on citizen diplomacy in the Soviet and Post-Soviet Russia of Fran Macy [73]demonstrate the joint work of the United States and CIS countries. So, the archive file [74]on "support of nongovernmental activism around the former Soviet nuclear weapons complex" demonstrates that two activists from Tomsk were identified as "likely candidates" out of ten others to visit the US nuclear complex in February-March 1993. Al'bina Biichaninova and Boris Nekrasov had been active in the Tomsk environmental movement for a long time. The objective of such a visit was to give the activists "a comprehensive firsthand learning experience with US counterpart groups" and "to build foundations for collaborative ties between American and Russian groups." The next document confirms the participation of Boris Nekrasov, representing the "*Ecological Initiative*," in the seminar on alternative energy in Russia on June 2-4, 1995 in Moscow.

Archival materials,[75] provided by Thomas B. Cochran, confirm the international work of Tomsk activists. The workshop on the future of the Russian

[73] Francis Underhill Macy (1943-2009) was an environmental activist and citizen diplomat.
[74] Stanford University, Hoover Institution Archives, in the section of Fran Macy's papers, Box 6, File 9.
[75] Report on an International Workshop on the Future of Reprocessing, and Arrangements for the Storage and Disposition of Already-Separated Plutonium (Moscow, 14-16 December 1992) and an

plutonium-production facilities was visited by V. A. Afonin, Albina Biichaninova, N. P. Dobrinenko, G. A. Gorunov (Tomsk television), Valeri Koniashkin (Nature Protection Committee), O. A. Kotikov, V. A. Kubrin, B. V. Nekrasov (journalist), and T. V. Nekrasova (Tomsk television).

Al'bina Biichaninova (1943-2010) was not only a medical scientist but also a poet and a prominent environmental activist. She often represented the movement *Èkologieskaâ Iniciativa* in Russia and abroad. Lupandin (1992, pp. 45-46) describes her as the leader of the ecological movement in Tomsk:

> In two years she turned from a simple little doctor into an important political figure who is known in Moscow and abroad. Her power and influence are so strong now that she can organize research by German, French and other western ecologist/scientists in Tomsk. She's turned into a social activist of such a level that even the highest level of political figures have to deal with her. Her letters to Gorbachev, for example, are answered by the first deputy chairman. That's very high up.

Boris Nekrasov (born 1960) is a journalist and environmental activist. Except *Èkologicheskaia Initsiativa* he was active in the *TĖSI* and the Siberian Environmental Alliance (*Sibirskii Prirodookhrannyi Al'ians*).[76] He is also a member of the International Federation of Environmental Journalists (Nekrasov, 1997).

Aleksandr Boltachev had been working as a laboratory assistant at the SCC and as a deputy editor for the magazine *Dialog* in Seversk. He wrote memoirs about his work and experience around the SCC. He shares shocking memories and opinions of other scientists, politicians, and workers from the SCC (Boltachev, 2015):

> As you know, in 1993 there was an explosion at the SCC with a plutonium release. But this did not disturb our nuclear specialists in the slightest [...]. Now they already say that it was not an explosion, but a clap, and all radionuclides that entered the environment have already decayed. Though the half-life of plutonium is 24065 years. It is a half-life. But, physicists say, plutonium will become completely harmless only in 240,650 years (half-life multiplied by 10).[77]

Valerii Koniashkin was an active member of *Èkologicheskaia Initsiativa.* Since 1993, he worked in the Administration of Tomsk Oblast. He coordinated the

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International Workshop on Nuclear Security Problems (Kiev, 17 December 1992) by Frank von Hippel, Princeton University and Thomas B. Cochran and Christopher Paine Natural Resources Defense Council, Washington, D. C. The workshop in Moscow was co-organized by Lydia Popova, the nuclear fuel specialist of the SEU.

[76]The organization was liquidated in 2007.

[77] Как известно, в 1993 году на СХК случился взрыв с выбросом плутония. Но это ничуть не смутило наших атомщиков […]. Сейчас они уже говорят, что был не взрыв, а хлопок и все попавшие в окружающую среду радионуклиды уже распались. Хотя период полураспада плутония – 24065 лет. Это полураспад. Но полностью безвредным, говорят физики, плутоний станет лишь через 240 650 лет (период полураспада помноженный на 10)

activities of environmental protection agencies to ensure environmental and radiation safety in the Tomsk region; the interaction of the Regional Administration with the environmental NGOs of Tomsk, Russia; and international environmental organizations. Koniashkin actively participated in governmental and nongovernmental environmental assessments. He was also engaged in the development of environmental legislation and the development and implementation of regional and federal environmental programs. Now he is engaged in ecological-educational activities.

He developed lectures and now gives them at the Tomsk State University: "Social Ecolgy," "Radiation Ecology," "Uban Ecology," and "Making Environmentally Significant Management Decisions."

Èkologicheskaia Initsiativa consisted of many scientists, politicians, journalists, and ordinary citizens, who fought for nature and people who were exposed to radiation contamination. They were the first environmental NGO in Tomsk that had a voice. They enlightened ordinary people about the importance of eco-activism, were internationally known, and were able to shed light on the negative impact of the SCC, which had long been withheld from the public. They also managed to stop some of the SCC projects. The exact date of when this NGO ceased to exist is unknown. However, there were three other NGOs that contributed to the development of the environmental movement in Tomsk: *TÈSI, Sibirskii Prirodookhrannyi Al'ians,* and the Siberian Environmental Agency (*Sibirskoe Èkologicheskoe Agentstvo).*

5.2.2.2 TÈSI

TÈSI was founded in 1996 on the initiative of Lev Blinov, a student from Tomsk State University. The first campaign of *TÈSI* was on the greening of Tomsk. Volunteers offered to bring seedlings to everyone who wanted them. This was welcomed by the Tomsk residents. Lev Blinov wanted to unite the environmental movement of Tomsk and made concrete steps in this direction; he summoned environmental NGOs to the table and initiated their joint statements on the most important problems. He also defended the increase of deductions for environmental activities in the regional budget. Under his leadership, *TÈSI* became the initiator of the unification of *zelenye* of Western Siberia.

TĖSI participated in the project of the SEU for Sustainable Energy, which brought together NGOs from most of the nuclear regions of Russia and Ukraine. *TĖSI* held protests and collected signatures against the project of construction of a nuclear heating plant in Seversk. One of the first large-scale cases by *TĖSI* was conducted in winter of 1996-1997; it was an examination of gamma background radiation in the area of Tomsk and Seversk. It turned out that the highest cesium content is in Chernil'shchikovo, which may be connected with the accident at the SCC in 1993. *TĖSI* also held anti-nuclear pickets; although this form of work has not become popular in Tomsk. And the focus of all efforts was aimed at ensuring that citizens living near nuclear facilities are directly involved in addressing issues related to the functioning of the nuclear complex.

Their spheres of activity besides radiation safety included environmental education and upbringing, public awareness, landscaping, and protection of the right to a healthy environment. The goal and motto of the organization was to comprehensively improve the ecological condition of Planet Earth, starting with Tomsk Oblast. The NGO shut down in 2017 (Shirokov, 2011).

5.2.2.3 Sibėkoagentstvo

Aleksei Toropov,[78] an ecologist and a member of *TĖSI*, is one of the founders and the director[79] of *Sibirskoe Èkologicheskoe Agentstvo (Sibėkoagentstvo)*. The NGO was registered in 2002 as a regional charitable public organization that included a group of like-minded people, already experienced in environmental NGOs, united on the basis of common interests to protect the environment and animals, preserve and restore the cultural environment, fight problems of rivers and their water protection zones, and increase the level of environmental literacy of the population, as well as its participation in and promotion of education, science, culture, art, education, and spiritual development of the individual. Other fields of interest include environmental and social problems associated with the operation of

[78] Aleksei Toropov is also the head of the Tomsk Green Cross *(Tomskii Zelenyj Krest).* This is a regional branch of the NGO Green Cross, which is a member of Green Cross International, founded by M. Gorbachev in 1993. More information here: http://www.green-cross.ru/about/

[79] As of 2021, the director is Vladislav Il'iashenko, Chairman of the Youth Parliament and a member of the regional council of supporters of the All-Russian political party "United Russia" (Edinaia Rossiia). https://kontragent.pro/individual/701718648624

the SCC, radiation safety of populations and territories, and non-proliferation of nuclear weapons. The NGO's slogan is the same as TĖSI's, "Saving the planet, starting with Tomsk Oblast" (*Spasaem planetu Zemlia, nachinaia s Tomskoi oblasti*).

Sibėkoagentstvo advocated a balance between nature and humans for the transition from an industrial to a highly intelligent way of developing society. Moreover, their goal was to lay the foundation for the sustainable development of mankind. That would also allow for a peaceful future for our descendants. As of 2005, the methods of actions included environmental control; formation of environmental awareness through mass media; organization of seminars, conferences, and public hearings; creation and implementation of environmental education programs; organization of scientific research, expeditions, examinations, and joint projects with other public, scientific, and state organizations; and collection, analysis, and distribution of environmentally significant information.

Sibėkoagentstvo managed to achieve a lot in various spheres of its activities. Regarding the problem of nuclear power, in 2000 the NGO initiated a radioecological research project that was independent from Rosatom. For several years, the radiation safety department of the *Oblkompriroda*, the Geoecology and Geochemistry Department of Tomsk Polytechnic University, the United Institute of Geology, Geophysics and Mineralogy of the Siberian Branch of the Russian Academy of Sciences in Novosibirsk, along with laboratories from other scientific institutions took part in the research.

In 2003, there was an international campaign against the development of the MOX program. It was held in Tomsk by *Sibėkoagentstvo* and *TĖSI*. Their main demand was to take into account the opinion of the residents of the 30-km zone of the SCC. Later, an initiative group of citizens appeared in Tomsk, collecting signatures of protest against the construction of the plant in the region. In 2004, a mass protest action called "Say no to MOX!" was held in Tomsk with the support of foreign environmental organizations. According to Toropov (2005, 29), the attitude of Tomsk residents towards plans to build new nuclear facilities in Tomsk Oblast remains steadily negative. He cites the example of a poll in 2000, when 80% of Tomsk residents supported the demands of local *zelenye* to prevent construction of new nuclear- and radiation-hazardous facilities at the SCC.

Sibėkoagentstvo also promoted the grassroots movement "Nuclear-Free Tomsk" (*Bez"iadernyi Tomsk*),[80] whose goal was to prevent the development of nuclear power in the region. The movement was intended to unite Tomsk NGOs, scientists, politicians, cultural figures, lawyers, entrepreneurs, journalists, and ordinary Tomsk residents who believe that Tomsk is no place for the implementation of the "dirty" plans of the transnational nuclear lobby (Toropov, 2005, 34).

Since 2012, Toropov has been a member of Rosatom's Public Council.[81] In 2013, *Sibėkoagentstvo* received a grant from Rosatom to create the People's Ecological Map of Tomsk Oblast (Narodnaia ėkologicheskaia karta). This map is designed to provide Internet users with access to up-to-date information about the state of the environment in the region and enable interactive participation of citizens in solving environmental problems and monitoring their solution.

5.2.2.4 Sibirskii Prirodookhrannyi Al′ians

The NGO *Sibirskii Prirodookhrannyi Al'ians* (*SPA*)[82] existed from 2000 to 2007. The head of the NGO was Boris Nekrasov. Toropov was also a member of the organization. One of the main areas of work involved radiation safety related to the activities of the SCC. *SPA* campaigned against the development of dangerous new projects by Minatom at the SCC sites, including the construction of a nuclear heating plant. As part of radiation monitoring, they carried out expeditions to study the immediate zone of SCC's impact. One of the problems raised was the impact of radioactive discharges of the SCC into the Tom River on the population of the villages located downstream of the discharges. *SPA* opposed the implementation of a project to import foreign spent nuclear fuel into Russia.

They worked together with other non-profit organizations in Tomsk, such as *TĖSI*. Their scope of action included collecting protest signatures, mass public actions, and appeals to authorities at various levels. Their goal was to force the

[80] No information confirming the establishment and further existence of the movement was found.

[81] The Council was created to involve public organizations in the development of policy in the field of the use of atomic energy, environmental protection, and nuclear and radiation safety. https://rosatom.ru/sustainability/public-council/

[82] http://www.seu.ru/members/sea/dela.htm

nuclear monopolists, politicians, and officials to take the opinions of the residents of Minatom's impact zones into consideration. In addition to nuclear power issues, they were involved in protecting the taiga from anthropogenic impact, organizing a national park, and preparing an environmental television program. Together with the environmental services, *SPA* members went on raids on logging sites and cedar nut harvesting.

SPA implemented several projects, including "Internet for Human Rights" (*Internet na strazhe prav cheloveka*) in 2001. This was the first attempt in the region to create a regional Internet network for nongovernmental organizations. They also conducted trainings for NGOs and students on how to use Internet technologies. And the participation of journalists in the project helped to better understand the "third" sector. In addition, they created an electronic newsletter "Nuclear Tomsk" (*Tomsk iadernyi*) dedicated to environmentally significant events in the SCC region. It covered information from different angles – ecology, politics, industry, and society.

5.2.3 Personal Communication with local environmental NGOs

Three environmental NGOs in Tomsk were chosen at the beginning of the research. I contacted several activists from these NGOs via their social media accounts. The personal communication took place in 2019-2020, before the active research started. Therefore, at that time, the list of questions was limited. It included questions about goals, quantity and quality of work, forms of action, national and international cooperation, and funding. Its aim was to discover their focus, goals, methods, and scope of action.

The first interview with activist Evgenii Petropavlovskii from the NGO Environmental Center Swift (*Ėkologicheskii Tsentr Strizh)* was conducted on August 15, 2019 via telephone. He is a businessman who has been active in the organization since 2006.[83] The main work of the organization is associated with biodiversity, especially protected natural areas, rare bird species, and ecological education of

[83] The NGO was founded in 2006 and continues to exist now. However, it was labeled as a "foreign agent" in 2016. The Ministry of Justice considered the funds received by the NGO from the Global Greengrants Fund for projects to preserve rare bird species and key ornithological areas in the Novosibirsk Region to be foreign financing of "political activities" of the NGO. But after long investigations, this status was withdrawn and the NGO was not included in the registry of foreign agents. https://tv2.today/TV2Old/Opasnaya-ptica-ili-kak-strizhi-stali-inostrannymi-agentami

young people. Sometimes they also participate in waste and bottle cleanups. Evgenii stated that the number of activists depends on the scale of the project. Sometimes it involves 100-150 people and sometimes only a few participants. These might be either full-time employees or volunteers.

According to the interviewee, *Ėkologicheskii Tsentr Strizh* does not cooperate with other international organizations; they work only with other Russian cities. This cooperation includes, for the most part, the Tomsk and Novosibirsk regions and regions "that are of interest to us in terms of biodiversity." It also became clear from the interview that the organization had never participated in any protests or demonstrations; rather, they choose other forms of activism such as studying rare species of birds and animals and training young environmental leaders. The activists also raise private donations for the implementation of raids to reduce poaching of valuable fish species, clean up household waste from various territories, and plant trees. They have an established network of supporters who participate in different events. The accomplishments of the organization are listed on their Vkontakte[84] profile. As of 2021, the Department of Natural Resources and Environmental Protection is the executive body of this NGO.

The next interview was with an activist, Sergei Frishman[85] from *Sibėkoagentstvo*, and was held on November 20, 2019 via text messages. The interview confirmed the scope of action mentioned in the previous subchapter. He added that the funding sources included small grants from abroad. Later, the sources came from Russian funds, inter alia, the so-called "presidential" ones. According to Sergei, in their preceding student organization,[86] they held demonstrations because back then it was "politically possible." The cooperation consisted of different environmental organizations, including Greenpeace Russia, SEU, and many others. According to the interviewee, the activists of the organization went to numerous conferences, including the G8 conference. They held a successful conference called "Rivers of Siberia V" and other small events. Sergei described the following deterioration of the organization after the initial success:

[84] Vkontakte is a Russian social media platform. More information about the work and accomplishments of *Ėkologicheskii Tsentr Strizh* may be found on their profile: https://vk.com/ecostrizh
[85] Sergei works as a lead ecologist in the radiation monitoring department of the *Oblkomprirody.*
[86] He refers to *TĖSI.*

> In the second half of the 2000s, officials began to "clamp down" on grassroots organizations, and an active implementation of federal legislation began to infringe on non-governmental, small organizations directly involved in solving problems on site. They [the government] introduced the concept of "Foreign Agent" into the public institution of NGOs. And since then, a conscious and step-by-step destruction of the public institution began. Under various pretexts, the government first began to force people to join the ranks of foreign agents, and then to forcibly assign this status, eroding the niche of civilian control. We also had been checked in connection with the introduction of this legislation, and somehow, we got away with it. Our organization gradually withdrew from the business when it all began, and now no one is active (Appendix B: Excerpts from the Interviews with Tomsk Activists).

Some of the reports of the accomplished work are presented on their social media account on Vkontakte.[87] According to the activist, they were forced to post such reports annually.

On April 20, 2020, I held the third interview via Vkontakte with Iuliia Popova, an activist from the organization "People's Movement Let's Protect the Tomsk Taiga" *(Narodnoe dvizhenie Zashchitim Tomskuiu Taigu).* Before answering the questions, Iuliia said: "Everything is much simpler than your questions imply. We are just people. We just love the forest, and we know what would happen if it was cut down." Up to that point, the NGO had existed for two years. The number of the activists always varies, from two to fifty, depending on "how busy we are." The main goal is to preserve and restore nature because it is "dying." According to the interviewee, the biggest issues of attaining the goal are "forest regulations and corruption." The organization does not rely on the institutional funding; thus, the main source of funding is people. Iuliia stated that they donated money for the quadcopter, the camera, and the trips. The next question on my part included the tactics and strategies the organization pursues.

According to Iuliia, these are "to make everything transparent, including interviews, footage of logging and collection of documents." Demonstrations or protests are not part of their methods in achieving the goals. Iuliia elaborated on it: "We don't hold rallies, for this to be effective, we need huge masses of people. And simply standing on the street is just a waste of time." Regarding the cooperation, Iuliia underlines the work with many Russian regions, consisting of grassroots activists. She also adds: "We communicate with scientists, not with state organizations. They work for whoever pays them. And we work conscientiously."

[87] Notwithstanding the de facto inactive status of the organization, there are still reposts from other environmental organizations, diverse news, and petitions: https://vk.com/sibecoagensy, although the data on the reporting activities of the NGO shows financial activity over the past two years: https://www.list-org.com/company/386278.

The work and progress of the NGO is described in the group header on Vkontakte.[88] Their work consists of going to the sites of mass logging, as well as recording the extent of logging and violations. They have also been developing petitions to revise legislation concerning illegal logging.

5.2.4 Summary and Current Standing

The environmental movement in Tomsk began to emerge in 1987 and had its ups and downs over the years. The first environmental NGO *Èkologicheskaia Initsiativa* marked the beginning of the anti-nuclear activism in the region. This NGO, and later *TĖSI*, contributed to the protection of the environment as an aftermath of the negative impact of the SCC. The main forms of resistance in the 1990s were picketing, conferences, demonstrations, expertise, spreading information among the population, and establishing a dialogue with the authorities, although the rally form of counteraction did not develop in Tomsk.

Èkologicheskaia Initsiativa has, over time, focused entirely on the problem of nuclear power. Organizations such as *TĖSI*, *Sibėkoagentstvo*, and *SPA* dealt with radiation safety issues but also focused on environmental education, building environmental awareness among the population through the media, preservation and restoration of the cultural environment, and animal protection. Amid the growing environmental activism, other NGOs emerged that were either short lived or have not been documented to this day.

Since the beginning of the new millennium, more and more environmental laws have been formed at the state level. Over time, there were fewer environmental organizations in Tomsk, although major SCC projects were disputed and protested. Since the foundation of Rosatom in 2007, new projects at the SCC have been discussed quite frequently. Since 2013, after the introduction of the law on foreign agents, environmental NGOs across Russia, including Tomsk, have come under pressure. Many organizations either simply ceased their activities or shifted their focus to other issues, such as landscaping or the problems of waste, deforestation, or poaching.

[88] Their profile: https://vk.com/les_tomsk

So, for example, one of the most recent projects at the SCC - *BREST-OD-300* reactor was not directly opposed by NGOs in the Tomsk region, yet several of them requested full transparency and access to all the documents from the hearings. However, they were outraged by the 50[89] billion rubles from the state budget to fund the construction of the reactor. Additionally, an Internet group called "Nuclear-Free Tomsk" (*Bez"iadernyi Tomsk*[90]) has been formed. Several scientists, among them ecologists, expressed doubts in the project.

Leonid Rikhvanov (2015) also reacted skeptically. He was actively engaged in the 1990s in radiological expertise in the area of Seversk and was frequently quoted by eco-activists. Rikhvanov organized and inspired several international conferences on radiation safety, biogeochemistry, and geochemical ecology. He stated that the SCC was at its most open from 1987 until about 1997. Of course, this was due to the most serious accident in the history of the plant, which happened on April 6, 1993. He adds that in the 1990s, the SCC representatives responded to comments and requests by the activists, but that period is over and now it is much more difficult to talk to the SCC regarding environmental issues. He describes the tendency this way:

> In the early 2000s, it was already noticeable. The enterprise stopped responding to inquiries. Sometime in 2002, the profile commission in the regional council and administration, which had been meeting monthly for many years before, dissolved. Today, this trend has reached its apogee. The SCC has become closed not only to the scientific community, but also, apparently, to the regional authorities. There are a lot of questions about the new projects that are now being conceived there, but the nuclear workers are walking away from them (Appendix D: Leonid Rikhvanov).

He also adds:

> I have a feeling that we are now rolling backwards. And the industry itself still looks at everything that has to do with harmful effects on the environment and human health the same way it did in Soviet times. Again, I am not a radical in my views, and I think the idea of nuclear power is a good thing. But the approach to its use, to the weighing of risks, must be fundamentally different. In their current form, the Russian nuclear plants are so dangerous that it would be better to have no nuclear plants at all (Appendix D: Leonid Rikhvanov).

Leonid Rikhvanov died on September 16, 2020. He was an outstanding scientist in the fields of geochemistry of radioactive elements in natural environments and radioecology. Rikhvanov made a significant contribution into

[89]The final expenses might vary, but as of 2021, this number is over 26 billion of rubles: https://www.tvtomsk.ru/news/65827-rostehnadzor-odobril-stroitelstvo-reaktora-brest-300-v-severske.html

[90] As of 2021, this group is not active anymore.

researching the activity of the SCC and its environmental impact on the Tomsk region. He was known for his work with *zelenye* in the 1990s.

The research shows that although NGOs have less freedom of speech and less action now, activists from Tomsk show their engagement via the Internet, for example, the petition "Does Tomsk need radioactive waste from other countries?" or a virtual protest[91] "against the nuclear dump." On the other side, the residents of Seversk do not protest for the closure of the SCC, but on the contrary, protest[92] against its closure. In 2016, the workers started a petition against the closure of the Conversion plant. After all, in that case almost the entire city would be unemployed. Moreover, that would lead to the closure of the whole nuclear complex and, thus, to financial losses. It is also worth noting that sociological studies since 2012 have recorded a consistent increase in the level of public acceptance of nuclear power development programs in Russia. Additionally, surveys[93] of the Levada center[94] show the declining fear of Russian citizens of a new "Chernobyl."

Only the future will show how the environmental movement in Tomsk will develop and how Rosatom's plans for the SCC will evolve. It is just hoped that Russia will also pursue a long-term nuclear phase-out policy like Belgium, Germany, and Switzerland. But as long as nuclear power is a strategic economic and political direction in Russia, and environmental NGOs are classified as foreign agents, this is unlikely. Only time will tell if there will be a new surge in the environmental movement in Russia, like the one that occurred in the late 1980s.

[91] https://tv2.today/News/Tomichi-proveli-virtualnyy-piket-protiv-yadernoy-svalki-v-severske
[92] https://tayga.info/130255
[93] https://www.levada.ru/2019/07/17/strah-rossiyan-pered-novym-chernobylem-snizilsya/
[94] Levada Analytical Center is an independent non-governmental research organization from Russia. Since 2016, it is listed as an NGO performing the functions of foreign agents.

6 Expert opinion on nuclear politics

6.1 Personal Communication with Thomas B. Cochran

Thomas B. Cochran is a retired nuclear physicist from the United States. He worked as a senior scientist in the nuclear program of the Natural Resources Defense Council (NRDC).[95] Cochran served as a consultant to various governmental and non-governmental agencies on energy, nuclear nonproliferation, nuclear reactors, and nuclear waste matters.

Figure 2 Thomas B. Cochran. Source: britannica.com

He co-organized several conferences, workshops, and seminars in joint American-Soviet projects. For this research, his experience and knowledge about the development of such projects might help to reconstruct the chronology of events and identify the key actors on both the Soviet and American sides. Moreover, Tom Cochran had been mentioned several times in the materials of *Èkologicheskaia Initsiativa*, as he provided satellite images for them. Also, the activists from Tomsk participated in joint seminars and conferences with him.

He has stated that after President Ronald Reagan got elected in 1980 and started preparing the weapons program, Cochran wanted to get involved with the topic of nuclear issues and arms control. At that time, only representatives of the state department and the arms control agency were involved with this topic, and nobody "was going to listen [to] what an environmental expert had to say on arms control." Cochran started working with William Arkin;[96] however, there was not enough data on nuclear weapons in the United States at that time. Soon they started writing the *Nuclear Weapons Databook* (together with Robert S. Norris), which received positive reviews and resulted in governmental funding. Their next book was on the Soviet Union. Cochran wanted to get more knowledge about "what is going on in the Soviet Union." In 1985, he had the idea to set up scientists from the US and Russia to monitor the test sites.

[95] NRDC is a non-profit international environmental advocacy group.
[96] William M. Arkin (1956*) is an Army intelligence analyst, political commentator, journalist, activist, author, academic and consultant to government.

Later, at a conference in Virginia at which the Soviet delegation was present, he met Andrei Kokoshin[97] and made a pitch to him about monitoring the test sites, which piqued Kokoshin's interest. After that, Cochran talked to Frank von Hippel[98] because he was going to Moscow, so he met there with Evgeny Velikhov[99] from the Soviet Academy of Sciences and they arranged a workshop in Moscow. After Cochran and von Hippel negotiated the financial question, Cochran went to that workshop. There were three proposals from the West, and one of them said that "it is possible to monitor the test site without getting there." Both sides agreed and signed an agreement to launch this joint verification project. They ran the project from 1986 to 1990. According to Cochran, Velikhov was "interested in opening up the Soviet secret cities." Cochran had a "very good working relation with the Soviet academy and the Institute of Physics of the Earth." They collected data about the current state of the nuclear weapons program in the USSR and the US. The work was productive and led to them being published. After writing this book, they started collecting data on Russian nuclear power plants, including Tomsk-7, and then they wrote a book together with Robert S. Norris and Oleg Bukharin, *Making the Russian Bomb: from Stalin to Yeltsin* in 1995.

According to Cochran, they cooperated with different laboratories, kept up the relationship with the Soviet side, worked on other arms control issues jointly, and held workshops. Cochran added that "some of this work has been done through the Russian foreign ministry."

In response to the question of why such workshops had stopped, Cochran said that the relationship with Russia began "cooling down" in the mid-nineties. After Yeltsin came to power, Velikhov did not have the same relationship with him as he had with Gorbachev. The second issue was financial. Moreover, after the US weapons laboratories started cooperating in the early 90s and as they got more involved, "we became a sideshow." Thus, they could not compete with the laboratories in terms of resources and provide that technical expertise.

In response to a question about the methods of communication with the Russian side, Cochran replied that there was no reliable way to communicate due to

[97] Russian politician, Soviet defense expert.

[98] Frank von Hippel (*1937) is a physicist, professor, and co-director of Program on Science and Global Security at Princeton University.

[99] Evgeny Velikhov is a physicist and political science adviser. At that time, he was the Vice President of the Soviet Academy of Sciences.

technology limitations. They had to bring people to the US or meet them in Russia. At the seminars and conferences, they interacted with environmental activists.

In response to my question about how this cooperation developed after Putin came to power, Cochran said "it got worse." He also added: "Everybody that we used to work with (still is), I think are scared to death to work with Americans, because they will get shut down by the Russian government today." Cochran noted that after working with Velikhov he tried "[for] the rest of [his] career to sort of replicate [other] similar cooperative activities" because he realized that just publishing papers is not enough. Cochran added that Velikhov was a "risk taker," so he could influence the politics and talk directly to Gorbachev. While Velikhov was busy, Mikhail Gokhberg[100] worked on organizational questions. Cochran stated: "You needed a Velikhov, Gorbachev and a Gokhberg. In the rest of my career, I could never find three key people."

6.2 Personal Communication with Andrei Ozharovskii

Andrei Ozharovskii is a nuclear engineer and an environmental activist from Moscow, Russia. He is a coordinator of the SEU "Radioactive Waste Safety" program. Since Ozharovskii is both a nuclear physicist and an eco-activist, he was an ideal candidate for this research. It was important for me to learn more about the dangers of nuclear power, his environmental activism, and governmental policy regarding the first two points.

Figure 3. Andrei Ozharovskii
Source: fedpress.ru

Ozharovskii said that after the Chernobyl accident there was a stir at the nongovernmental level. He was in a student group, an organization independent of the Komsomol, and they went to rally for democracy and against the Communist Party. He was amidst nascent organizations – youth, political, and environmental.

Through such small initiatives, he came to his main topic – the nuclear power issue. He remembers that after the idea of taking foreign spent nuclear fuel to Russia was introduced, a large environmental wave spread across the country. He sensed clear injustice, and that is how he became an eco-activist. According to Ozharovskii,

[100] Mikhail Gokhberg is a physicist and was, at that time, the Deputy Director of the Institute of Physics of the Earth.

as Putin came to power, he authorized the import of foreign spent nuclear fuel into Russia and still does so under conditions of temporary storage or reprocessing. That is when Ozharovskii began getting involved in public discussions with nuclear power representatives who would often say to journalists and activists, “you don't understand anything about this, you have no education.” Since he had a relevant degree, he was able to prove his point of view through a scientific lens.

Ozharovskii also participated in the campaign against the importation of depleted uranium and worked together with the activists from Tomsk in this regard. He began to gather information, and the more he gathered, the more he became convinced that he was right. He added that back then “there were real opportunities to influence the situation”; however, “they are still there now, but they are different.” His words confirmed the conclusion of chapter five – that today, environmental NGOs have less freedom than in the 1990s and early 2000s. Ozharovskii explains that the activists were aware of a possible punishment after protests; however, they still took a risk because it was about uranium tailings. Such demonstrations took place in Tomsk, Yekaterinburg, and Irkutsk. At that time, the maximum form of punishment was fines. He also commented on the tightening of laws and freedom of the press:

> There was more freedom in the media at the regional levels. At the federal level, it was no longer possible to get on any talk shows. In the late 90s, our goal was to get the word out through every possible media outlet, to get our position across to large groups of the population. Now you can’t do something like that, it’s a criminal offense, and that’s too bad. [...] There is also a registration into foreign agents if you receive money from foreign foundations. [...] The Russian Socio-Ecological Union is the only registered organization. Many went through foreign agents’ labeling; they were forced to close down (Appendix C: Excerpts from the Interview Transcript: Andrei Ozharovskii).

Ozharovskii also calls the confrontation between environmental NGOs and the state a “cat-and-mouse game.” In other words, the state is trying to reduce the opportunities for NGOs and they, in turn, are trying to circumvent funding issues. He added that the state is trying to bring back the Soviet system. In other words, environmental divisions that are being created in public chambers are similar to the VOOP; he calls them “servile,” since such organizations are created for the nuclear power industry, such as the Public Council at the head of Rosatom. Moreover, the Council does not make its own decisions; it is the head of Rosatom himself who appoints them. Ozharovskii adds that it is always possible to find public organizations convenient for the nuclear industry or those environmental

organizations that are not directly involved in nuclear power. He also comments on Rosatom's cooperations and activity:

> It is forbidden to receive money from the Böll Foundation and criticize the nuclear industry in Russia, but to receive money from Rosatom to love Rosatom - they give out grants. They hold contests, sometimes what they do is good, like fixing a roof in a hospital, equipping a physics lab in a school, it's called buying loyalty. Rosatom also cooperates with some of the media, it is clear that they will not interview me because I will criticize them. Fortunately now traditional media (like newspapers, television) don't play a significant role - Internet is an opportunity. The cat and mouse game continues (Appendix C: Excerpts from the Interview Transcript: Andrei Ozharovskii).

The next question was about international cooperation. Ozharovskii noted that they cooperated with Germany. Once, when the Internet was not yet ubiquitous in Russia, they learned of a group of activists from Gronau, which had been in existence since the 1980s. They began working together, learning from each other, and then covering each other's campaigns in the media.

The last question on my part was how he sees the future of nuclear energy in Russia. Ozharovskii named two possible scenarios, although he believes that nuclear power has no future in any country in the world. And Russia, along with China, will probably be one of the last countries to discontinue these technologies. The first scenario, according to Ozharovskii, is due to economic inefficiency and the second one to another nuclear accident. Since people and the environment would be damaged in the second variant, reactors may be shut down as after Chernobyl or Fukushima, without any preparation. In his opinion, the mission of environmentalists throughout Russia is to prevent the worst-case scenario. It is necessary to speak out and counteract propaganda because Rosatom promotes nuclear power as environmentally friendly, green, and reliable. Ozharovskii believes that the next accident might happen because "no one is immune from mistakes." For example, at Chernobyl the cause of the accident was a mistake by the project engineers. He added: "And any device that was made by a human being has an engineering error. Simply because an engineer is not equal to God."

7 Conclusion

Environmentalism in Russia has evolved over decades and has taken on different forms depending on the political situation. From the 18th century onward, societies began to emerge that were mainly concerned with agriculture, forestry, and fisheries. Already in the following century, more and more scientists began to show interest in the study of nature, mainly to improve human life and their environment. However, laws on the protection of nature have been developing gradually but not in a consequential way. In the 1920s, the first laws on the protection of natural sites were passed.

At the initiative of scientists and with the support of the state, the All-Russian Society for the Protection of Nature was founded in 1924. In the mid-20th century, as industrialization gained momentum along with a totalitarian regime, nature was subjected to even more negative impacts. At the same time, environmental legislation aimed at preserving forest and water resources was further improved, water and air quality standards were developed, and measures were taken to protect public health. However, it looked more like the consequences were being fought, rather than the causes of the environmental crisis.

Only in the 1970s and 1980s did the environmental issues begin being prioritized, and the concept of environmental law was soon introduced. However, the development of environmental legislation did not happen without the help of the environmental movement. The devastating accident at Chernobyl shook society on the whole and undermined the trust of Soviet citizens towards the government. It coincided with the declassification of information that showed the real environmental situation. That is when the all-embracing environmental movement in Russia was born. At the same time, the anti-nuclear movement began to expand. Eco-activists demanded transparency in the operation of nuclear enterprises, and even their closure, due to their destructive impact on nature and people. Those years were also marked by the development of US-Soviet citizen diplomacy, which was based on cooperation and joint initiatives, including anti-nuclear ones.

Although the environmental movement throughout the USSR gained more momentum, the dangers of nuclear power in many cities were still being hushed up. For example, the Siberian Chemical Combine, located near Tomsk, was virtually unknown to the world. The town Tomsk-7 remained secret for several decades, and

its initial goal was to produce weapons-grade uranium and plutonium for nuclear warheads. The analysis showed that the SCC has maintained silence for decades about its negative impact on the environment, including hiding accidents and radioactive discharges into the rivers in the area. The SCC did not provide reliable information about its activity to the public until the early 1990s.

Amid the nationwide development of the environmental movement, a grassroots movement was also born in Tomsk. The analysis showed that the environmental movement in Tomsk emerged in late 1987 and consisted of engineers, creative intelligentsia, and scientists concerned with the environmental problems of the city. The group was officially registered as the sixth section of the VOOP. At first, its goal was to oppose building a plant of protein-vitamin concentrates in Tomsk. However, the movement spread quickly and acquired more activists and a wide range of environmental and social problems in its sphere of interest.

After reorganization, the movement was revived and was called "*Èkologicheskaia Initsiativa".* It became primarily the anti-nuclear movement. This NGO consisted of scientists, politicians, journalists, and ordinary citizens who made it their main task to protect nature and people from the destructive radiation impact of the SCC. *Èkologicheskaia Initsiativa* was a member of the SEU and cooperated with other NGOs from the former Soviet Union and the United States. They wanted to create a new alternative system of values, not built on the traditional pillars of economics, politics, and culture, but rather to reject mass industrial production, which has an irreparable impact on the environment. The eco-activists held campaigns, rallies, conferences, demonstrations, examinations, and research of the radiation situation in the area. They also controlled the medical situation, worked with the media, and enlightened the local citizens on the real environmental situation.

The research confirms that *Èkologicheskaia Initsiativa* identified nature and humans as the environment, which is affected by the destructive impact of the SCC. However, in the late 1990s and early 2000s, there emerged three more NGOs in Tomsk that contributed to the environmental movement. They opposed new projects of the SCC and stated its radiation impact. For example, *Sibėkoagentstvo* advocated a balance between nature and humans for the transition from an industrial to a highly intelligent way of developing society.

In 1993, after the accident at the SCC, the whole world learned about Tomsk-7. This case received major attention and showed an even greater negative impact of

the facility on the environment, while the SCC still denied such a significant impact. Along with the development of the ecological movement in Russia and Tomsk, and declassification of information about the SCC, regulations were also developed both on the federal and regional levels. However, for a long time they had an imperfect and contradictory character.

As of 2021, environmental policy is loaded with various laws and regulations, including a large number of departments and committees in the region. It is an over-bureaucratized system, which all the environmental executive bodies and enterprises are obliged to obey. Now the SCC is a part of Rosatom, which operates under the wing of the Russian Federation. They still promote nuclear energy as a clean and sustainable source of energy. Environmental monitoring conducted at the SCC shows the improvement of the radiation situation, although research by scientists and independent experts in the 1990s showed negative radiation impacts that will still be in the biosphere for generations to come.

The research shows the nuclear power plant in Seversk in the quadrangle of interests – the environmental movement, politics, bureaucracy, and the industrial lobby.

It can be concluded that on the non-governmental level, there is no such environmental movement in Tomsk as before. Most of the organizations that are active are not engaged in nuclear power issues but in other environmental problems, such as deforestation, poaching, waste, or biodiversity protection. They work on the ground, draft petitions, or educate the public about the environment. However, with the tightening of laws at the federal level, including the law on foreign agents, many NGOs were forced to cease their activities.

The research, as well as interviews conducted with activists confirm that despite the pressure from the state, there are still methods of resistance. The Internet is one of such methods. Further research is needed to determine the governmental and nongovernmental solutions in the Tomsk region regarding other environmental issues apart from nuclear power.

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9 Appendices

9.1 Appendix A: Excerpts from the digest *SKHK glazami zelenogo dvizhenia*

Но вот монолит тоталитарного режима дал глубокую трещину и в 1989 году, через 35 лет после начала функционирования СХК, появились первые публикации в прессе. Полное название эого предприятия известно мало кому из числа кадровых работников, а звучит оно так: Сибирский орденов Ленина и Октябрьской Революции химический комбинат имени М. В. Ломоносова. […] На пике развития ядерного комплекса в СССР действовало 13 промышленных реакторов, нарабатывавших плутоний. Пять из них работали в Томске-7, столько же в Челябинске-40 и три – в Красноярске-26. Уже отсюда можно сделать вывод: СХК – крупнейшее в отрасли предприятие. Но по ряду показателей – крупнейшее в мире. В состав комбината входит целая система заводов, связанных воедино технологической цепью. Эта цепь превращает СХК в предприятие полного цикла (p.4).

Я пришел сюда сказать то, что сегодня вам не скажет ни одно официальное лицо. В стране парадоксов мы привыкли к тому, что люди, по долгу и званию своему призванные охранять здоровье людей, из шкуры вон лезут для защиты интересов атомного ведомства (p.8).

Сброшенные в водохранилище и могильники ядерные материалы СХК, умышленно занижались и скрывались руководством комбината с ведома министерства, органов КГБ, Горкома и Обкома КПСС. Попытки призвать к благоразумию были безуспешны, а лица, вставшие на защиту государственных интересов, беспощадно подавлены. […] потери плутония происходили из-за безответственности и попустительство. 1.5-3.0 кг продукции в месяц терялись через спецканализацию с зумфовыми (сбросными) водами. […] результаты баланса были сфальсифицированы. Вот почему руководство СХК и министерства упорно отрекалось от операций, делая вид, что ничего не произошло (все это хранилось в объяснительных, актах местных и ведомственных комиссий). Это было что-то на уровне мафии, так как многократные обращения в органы КГБ […], прокуратуру и ЦК КПСС практически остались проигнорированными или решенными узковедомственно на уровне безликих отписок и отговорок (p.23-25).

В пятьдесят первом из Подмосковья «завербованные» для работы на строящемся в Сибири секретном заводе приехали в Томск-7 мои родители. Здесь они оттрубили на одном из самых «грязных» объектов до пенсии. В свое время мама едва отвезла отца до московской клиники – профзаболевание, полгода усиленного лечения. В итоге – инвалидность. Из тех демобилизованных парней, что четверть века назад вместе с моим мужем, ныне тоже работником СХК, прибыли на «почтовый», в живых остались не многие. Кто умер от рака, кто – в результате внезапного кровоизлияния в мозг. Были и такие, кто покончили с собой. На своих детей я смотрю с тревогой: что будет с ними? […] До Чернобыля их как бы не существовало – работающих на заводах по переработке урана и плутония, подвергшихся длительному воздействию

радиации и в результате получивших хроническую лучевую болезнь. […] В один из дней мы отправились на городское кладбище. Муж стал обращать внимание на свежие могилы своих сослуживцев, работников комбината. Их можно узнать по памятникам, выполненным из высококачественной нержавеющей стали. Добротные такие, одинаковой формы. Их делают на СХК. И вдруг ... наше кладбище, как случайно раскрытая книга, обнажило тщательно скрываемый ведомственный секрет. Повсюду стальным холодным светом поблескивали комбинатовские памятники. Мы начали считать продолжительность жизни наших земляков: 59 лет, 41, 64, 60, 38, 47, 49, 54, 39, 51... Добровольцы, комсомольские сердца (p.29-31).

9.2 Appendix B: Excerpts from the Interviews with Tomsk Activists

Sergei Frishman from *Sibėkoagentstvo*

Во второй половине двухтысячных чиновники стали «зажимать» низовые организации, началось активное внедрение федерального законодательства ущемляющего низовые, мелкие организации непосредственно занимающиеся решением проблем на местах. Внедрили в общественный институт НПО понятие «иноагент». И с тех пор, началось сознательное и поэтапное уничтожение общественного института. Под разными предлогами начали сначала принуждать вступать в ряды иноагентов, а затем принудительно приписывать этот статус выхолащивая нишу гражданского контроля. У нас тоже были проверки связанные с введением этого законодательства и как то пронесло. Наша организация постепенно отошла от дел еще когда все это начиналось, и сейчас активной деятельностью никто не занимается.

Iulia Popova from *Narodnoe dvizhenie Zashchitim Tomskuiu Taigu*

Все у нас гораздо проще, чем подразумевают ваши вопросы. Мы просто люди. Просто любим лес и осознаем, что будет, если его вырубить.
Митинги мы не устраиваем – чтоб это было эффективно, нужные огромные массы людей. А просто постоять на улице – только время потерять.
Общаемся с активистами. С государственными организациями – нет. Они работают на того, кто платит. А мы на совесть.

9.3 Appendix C: Excerpts from the Interview Transcript: Andrei Ozharovskii

Это чудовищная, человеком сделанная катастрофа, ее вполне можно было избежать. Я варился в бульончике зарождающихся организаций – молодежных, политических, экологических. […] Первая кампания, которую я помню, была против переброски сибирских рек. […] К нам приходили ребята, которые объясняли, что «вот это плохо». Я тогда и начал взрослеть и понимать, а как так, если партия говорит, что хорошо, а это плохо. Через такие мелкие инициативы я пришел к своей главной тем. В 90х (не помню год) была идея

забирать иностранное отработавшее ядерное топливо, вот как сейчас с URENCO мы забираем обедненный гексафторид натрия (урановые хвосты). В какой-то момент нашли слабое звено и решили, а давайте вот в Россию. Дальше помню уже хорошо, потому что это Путин делал, были внесены поправки в проект законов. Он разрешил ввоз в Россию иностранного отработавшего ядерного топлива и до сих пор «на условиях временного хранения или переработки». Была огромная волна экологическая, ровно 2000 год. […] Все это меня и подтолкнуло к тому, чтобы внимательнее следить за проблемами атомной энергетики. Потому что это явная несправедливость, с этого я именно как активист и родился. […] Я начал вовлекаться в публичные дискусии с атомщиками, они часто говорили «а вы ничего в этом не понимаете» - журналистам, например, «у вас нет образования» и тут я понял я могу сказать «опаньки, а у меня есть образование». Это такой конфликт дискусии, это очень важно для общественности, что если люди и с образованием, которые так же думают.

Из того что я делал в начале 2000х было больше свободы. Мы делали много хороших акций, например в Томске, Екатеринбурге, Иркутске. В те места, куда Urenco завозил урановые хвосты. У нас все получалось. […] Мы в Томске стояли с транспарантами. И репрессии не последовало. Люди, которые выходили на улицы понимали, что за этим может последовать наказание. Нас раньше не забирали в полицию, просто нужно было заплатить штраф. […] Например, в Томске запрещено собираться массово в городе с демонстрацией, но мы понимали, что мы можем пойти на небольшое нарушение, если речь идет об урановых хвостах. Было больше свободы в СМИ на областных уровнях. На федеральном уровне попасть в какие-то ток-шоу уже было невозможно. В конце 90х у нас была цель донести информацию через все возможные СМИ, донести свою позицию для больших кругов населения. Сейчас не удастся сделать что-то подобное – это уголовка, и это уже совсем плохо. […] Так же есть запись в иностранные агенты, если получаешь деньги от зарубежных фондов. […] Российский социально-экологический союз – единственная зарегистрированная организация. Многие прошли через иногентов, они были вынужденны закрыться.

Не помню, чтобы слово экология использовалось в Советском Союзе, была охрана окружающей среды, было официальное общество ВООП (в основном были птички, заповедники). И сейчас примерно тоже самое, создаются экологические подразделения в общественных палатах, создаются совершенное «подкаблучные» организации по атомной энергетике, например общественный совет в главе Росатома. Почему подкаблучные? Потому что не Совет решает, а сам глава Росатома назначает. Всегда можно найти общественные организации удобные для атомной промышленности, ну либо те экологические организации, которые не занимаются непосредственно атомной энергетикой (например фонд дикой природы). Получать деньги фонда Бёлля и критиковать атомную промышленность в России запрещено, а получать деньги Росатома, чтобы любить Росатом – они раздают гранты. Они проводят конкурсы, иногда то, что они делают это хорошо, например починят крышу в больнице, оборудуют физическую лабораторию в школе, это называется «покупка лояльности». Росатом сотрудничает и с некоторыми СМИ, понятно, что они у меня интервью брать не будут, так как я буду критиковать, а у

некоторых других – пожалуйста. К счастью сейчас традиционные СМИ не играют значительной роли (как газеты, телевидение) – возможность это интернет. Кошки-мышки продолжаются.

Я считаю, что будущего у атомной энергетики нет ни в одной стране мира. И Россия, наряду с Китаем, возможно, станут одной из последних стран, которая от этих технологий откажется. И отказ может произойти, тут грубо говорят два сценария. Может произойти спокойно, в силу экономической неэффективности. Мы проводили исследование вместе с Беллоной о реальной цене атомного электричества включая все субсидии, оно в итоге намного дороже чем на газе.
А может быть сценарий не такой мягкий, может произойти очередная радиационная катастрофа, пострадают люди, и будут закрываться как после Чернобыля или Фукусимы реакторы в срочном порядке, без какой-либо подготовки.

Все хранильники строят типовые, а тут сказали, что в наихудшем сценарии (Росатом написал не пропаганду, а правду), эти бетонные конструкции (оно же приповерхностное, чуть заглубленное) могут быть разрушены уже через 100 лет, могут быть и утечки – загрязнение воды. […] Сейчас там остатки аварии 1993 года – все еще там. Меня поразил анализ урана и плутония в волосах детей. Из хорошего – в Северске радиохимическое производство выводится из эксплуатации. Они его разбирать будут, отходы в контейнер.

Одной из целей экологических организаций часто бывает срыв опасных планов какой-то промышленности, например ядерной. Не народная дипломатия, а совместная кампания. Сотрудничали с немцами. Увидели, например, была группа, выступавшая против ядерных хвостов в Гранау с 1980х (от 3 до 15 человек). Потом мы поняли где источник, помог интернет. Тогда и удалась кампания после знакомства с этой группой. Сплотились. Когда они делали акцию, то у нас писали журналисты про них и наоборот. Взаимное усиление. Они говорили, что не этично, что хвосты в Россию ввозят.

9.4 Appendix D: Leonid Rikhvanov

В начале 2000-х она была уже заметна. Предприятие перестал реагировать на запросы, полноценную информацию заменил пиар. Где-то в 2002 году распалась профильная комиссия в областном совете и администрации, которая до этого в течении многих лет собиралась ежемесячно. На сегодняшний день эта тенденция достигла апогея. СХК стал закрытым не только для научной общественности, но и, по-видимому, для региональной власти. К новым проектам, которые сейчас там затеваются, есть масса вопросов, но атомщики уходят от них.

У меня ощущение, что сейчас мы откатываемся назад. А сама отрасль на все, что касается вредного воздействия на окружающую среду и здоровье человека,

по-прежнему смотрит так же, как в советское время. Повторюсь, по своим взглядам я не радикал и считаю идею атомной энергии благом. Но подход к ее использованию, к взвешиванию рисков, должен быть принципиально другим. В своем нынешнем виде российские атомные предприятия опасны настолько, что лучше бы их действительно не было вообще.

Eidesstattliche Erklärung

Hiermit erkläre ich, dass ich die vorliegende Hausarbeit selbständig und ohne fremde Hilfe geschrieben und nur die von mir angegebenen Hilfsmittel verwendet habe. Ich versichere, dass ich alle wörtlichen und sinngemäßen Übernahmen aus anderen Werken als solche kenntlich gemacht habe.

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