

THE RISK AND PROTECTION OF ENVIRONMENT, SUSTAINABLE DEVELOPMENT AND EXPERIENCES IN THE NUCLEAR SPHERE

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*“The richest country is that which breeds the greatest number
of noble and happy human beings”.*
(*Ruskin John*)

ABSTRACT: Armed conflicts within states are becoming increasingly serious. With an increasing frequency of natural disasters, heat waves, floods, while technical progress leads to a disruption of the balance of natural resources. Technological progress, although indirectly during the 20th century, led to many destructions (world wars, Hiroshima, Chernobyl). The risk and protection from ionizing radiation in the world today is very actual. As we know protection of the environment and economic activities are mainly opposed interests and there is no key that will resist to the laws of nature.

KEYWORDS: *protection, environment, radiation, law*
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1. INTRODUCTION

None of the people and the countries in the world today cannot be protected from the influence of planetary integrations. The development of technique builds in people such opinion of the world, faith in their own strength and value, as well as the sense of power, though our world is also divided, Armed conflicts within states are becoming increasingly serious. It is important to note that the total number of deaths related to the war conflicts in the twentieth century is estimated to be 187 million people. The threat to civilization is also the modern terrorism that is spreading.

We should all be aware that in the world there is a constant change, and it is interesting view that all accidents and incidents in the world stem from the lack of mutual understanding and respect. Today, man is also a victim of technology with an increasing frequency of natural disasters, heat waves, floods, while technical progress leads to a disruption of the balance of natural resources.

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In November 2016 earthquakes happened in Japan and on the New Zealand, and in December in Peru. In January 2017. three strong earthquakes again hit central part of Italy (Lacio, Abruzzo and Marche) and at the end of month Greek island Crete. Crack on Antarctica does not cease to spread and from the 1st January this year enlarged for 10 kilometers reported the investigators from the University of Swansea and Aberystwyth. The public began to pay attention to the environmental and agricultural effects of climate change. Rising sea levels affect the areas inhabited by a large part of the world population. The physical processes behind global raising of ocean levels have been gradual, but they are continuing.

Are we responsible for the impact of global warming and how to adapt and mitigate the resulting changes in all spheres of life?

There is no key that will resist to the laws of nature. Technological progress, although indirectly during the 20th century, led to many destructions (world wars, Hiroshima, Chernobyl).

2. IMPORTANCE OF LEGAL PROTECTION FROM NATURAL DISASTERS IN THE REPUBLIC OF SERBIA

It is said that misfortune comes only through the door that we left open. There are various conditions that can lead to a crisis, because in life there are strong undeserved misfortunes. But a man can light up the present by the future. Since the seventies of the twentieth century "risk" is one way of dealing with vague uncertainty that takes over our world. Bhopal gas disaster which showed that the company applied double standards, reducing the security measures in the Third World has not been forgotten, as well as Chernobyl as one of the worst disasters in history, and disaster in Japan /Fukushima/ where after a dangerous and time-consuming process of removing fuel rods in a damaged building in which the reactors were located the reaction of workers in the nuclear power plant was timely and self-sacrificing. According to Francois Walter in 2012, the culture of risk is always powered on symbolic resources, all the more so when the world is ruled by ideology of precaution and sustainable development in the shadow of the announced ecological disaster. Some authors argue that the world is moving towards the future „clash of civilizations“. (*Hantington S.*)

Law on ratification of Disaster Preparedness and Prevention Initiative for South Eastern Europe Memorandum of understanding on the Institutional Framework of the Disaster Preparedness and Prevention Initiative for South Eastern Europe (2013) was adopted in the Republic of Serbia in year 2015. The principal objectives of the Disaster Preparedness and Prevention Initiative for South Eastern Europe are to contribute to the institutional capacity-building of disaster management organizations to enhance disaster prevention and preparedness in the countries of South Eastern Europe in addition to everything else by strengthening and enhancing bilateral and multilateral cooperation, facilitating exchange of information in the field of disaster preparedness and prevention at all levels among competent national disaster management authorities and other relevant institutions in the SEE region, in accordance with the national regulations regarding the exchange of information.

During October 2013, the Japanese Nuclear Regulatory Agency informed the company "Tepko", which manages the damaged nuclear plant "Fukushima", that it must take drastic measures to alleviate a series of problems manifested in that nuclear complex. We still remember that in the middle of September 2015, torrents carried contaminated waste from the nuclear power plant "Fukushima" into Japanese rivers (a devastating earthquake hit Japan on March 11, 2011).

Today we are witnessing an agreement on the construction of a nuclear power plant about 60 kilometers from Serbia.

Protection of the environment and economic activities are mainly opposed interests, environmentalists in today's environment are fighting to preserve existing resources, while many forests are disappearing around the world and these days, we all speak on the reduction of energy consumption.

This topic has become a key research area for the information and communication technology (ICT) industry due to environmental and economic reasons. The environmental direction aims at minimization of greenhouse gas emissions by enforcing the usage of renewable energy in many sectors, exp. the ICT industry.

The war in Ukraine dramatically accelerated the implementation of Poland's energy diversification plan. And Poland is turning to nuclear energy. The American "Westinghouse" will become Poland's first partner in the construction of a nuclear power plant near Krakow, which would be implemented between 2026 and 2033. And in cooperation with South Korea, the construction of a second nuclear power plant in Patnów is also planned. The International Atomic Energy Agency (IAEA) announced in November 2022 that it was concerned about the situation at the nuclear plant in Zaporozhye, but that it found no signs of undeclared nuclear activity at three locations in Ukraine, while noticeable damage was done at different locations.

3. IMPORTANCE OF LEGAL REGULATION AND PROTECTION AT WORK

This paper is also devoted to the prevention and precaution in the struggle against ionizing radiation contamination. According to the world standards, of the total number of people suffering from malignant diseases, the ionizing radiation is responsible for approximately 5-10% of the cases. Legal regulation of the issues of ionizing radiation protection is expanded by issuing of detailed technical rules and standards.

The Decree of the President of the Republic of Serbia of December 8, 2018 promulgated the Law on Radiation and Nuclear Safety and Security¹, which was adopted by the National Assembly of the Republic of Serbia on December 7, 2018 ("Official Gazette of the Republic Serbia" no. 95/18).

Each society fights against the possibility that modern technologies cause catastrophic consequences for people by making and application of legal regulation, equipment and organization of the protection management. For enforcement of regulation of environmental protection, there are extremely important and already known principles: integration, prevention and precaution, natural values preservation, sustainable

¹ On the date of entry into force of this law, the Law on Protection from Ionizing Radiation and on Nuclear Safety ceases to be valid ("Official Gazette of the Republic of Serbia" no. 36/09 and 93/12).

development, application of motivation measures. Besides these principles, the principles whose application contains the concrete action of preventing measures of pollution control - principle of information and participation of public and principle of protection of the right on healthy environment and access to justice, as well as repressive measures for the case of the determined pollution. The need for education of population on danger of ionizing radiation, as well as manners of protection is of crucial importance for preservation of health of population and protection of environment.

The reasons for rising of frequency of health disorders are most often looked for in the working conditions on the places exposed to ionizing radiation, in not adequate application of protective measures on work, as well as in conditions of life.

Question is what percentage of employees is endangered on the job? The first report on increased number of leukaemia(s) in radiological workers was published back in 1911. Workers exposed to radiation today go through monitors in order to check signs of contamination, while scanners and individual dosimeters help to observe the level of exposition to radiation because of provision that workers stay inside safe range.

The importance of informing of public of the dangers of ionizing radiation brings is stressed, as well as the role of "strengthened attention" of employees that are especially exposed to ionizing radiation at their working place. Informing of public on ionizing radiation coming from nature and taking steps for its reduction should be one of the priorities of our society in the next long-term period. Recognition and application of the right on access to information on environment is one of the main goals of the environmental protection law. The availability of information on the condition of environment or projects which influence it is the pre condition for effective participation of citizens in the decision making processes.

Prevention of harmful effects on the job requires continuous work on prevention, which includes not only systematic checkups, but also education and information and protective measures from risks of professional diseases, but also from the risk of each individual towards the personal health risks. While acute radiation damages are caused by irradiation with only one strong dose in the short time period, chronic diseases are the result of more times repeated small doses of radiation.

4. CLIMATE CHANGE, RADIATION AND SUSTAINABLE DEVELOPMENT IN THE MODERN ERA

The Agency for Protection against Ionizing Radiation and Nuclear Safety of Serbia has estimated that the radionuclide (radioactive iodine-131) entered the atmosphere over part of Europe, as they say, most likely from the pharmaceutical industry. But the "radioactive cloud" was reported by the Institute for Radiation Protection and Nuclear Safety of France, which was found in the air over Northern and Western Europe, allegedly without affecting the health of the population and the environment.

And on February 11, the Japanese marked 11 years since 18,500 people were killed or disappeared in the powerful earthquake and tsunami that caused the nuclear disaster at the Fukushima plant. At 2:40 p.m., a ceremony was held in Tokyo and a minute of silence for the victims of the 2011 earthquake, which had a magnitude of 9 on the Richter scale. More than 123,000 people are still displaced due to high radiation levels caused by the accident at the nuclear power plant.

It is clear that environmental protection requires significant intervention of any state (preventive, legislative, corrective). Environmental contamination by radioactive elements is certainly at the top of all the problems that have ever existed, and the main concern is the need to protect nature and man. Russian Lake Karachay - born of nuclear ballast back in 1957, today is set in concrete. It is known that the archipelago of Kiribati or Marshall Islands were once the site of nuclear testing. But the less known is that according to the Agreement of 1959, Antarctica was elected as a place of "peaceful research". It is interesting that in November 2016. Swiss citizens (55% of voters from many cantons) in a referendum rejected the proposal on an accelerated withdrawal from nuclear energy in their country. The Government in Switzerland agreed not to replace their existing nuclear power plants and they can work until considered safe.

As we know the Comprehensive Nuclear-Test Ban Treaty (CTBT) prohibits all nuclear weapon test explosions or other nuclear explosions anywhere. Further investigations should be performed... In December 2016. the public learns that a dome has been placed over the damaged reactor of the Chernobyl power plant, which should protect the plant and prevent radiation for the next 100 years. Unfortunately, even without wars, during the winter, in January 2017 in our capital town Belgrade 1.635 citizens died.

United Nations Framework Convention on Climate Change (1992) and the Kyoto Protocol (1997) predict that each State Party, in order to encourage sustainable development, will implement (art. 2. from Kyoto) research, support to the development and increased use of new and renewable energy sources.

Since the beginning of this century enthusiasm demonstrated in Europe towards the replacement of sources of energy harmful for the environment with renewable energy sources has been supported in certain countries and this process was encouraged by the European Union (EU). Serbia is not member state in EU, but in response to the ecological, market, political and social challenges of the 21st century in September 2010. started operating the National Center for Sustainable Development in Belgrade.

At a time when they were introduced, incentives for renewable energy production were in the experimental stage, what led to the learning from trials and errors by states. (See: Directive EU 2001/77/EZ no longer in force, repealed by Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009. on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (*OJ L 140, 5.6.2009, p. 16–62*). The share of electricity which is produced from renewable energy sources in the Community by governmental assistance (privileged price) is relatively low.

At the beginning of the 2017. public in Serbia has received a report that there is no radiation from the barracks in Kačarevo, i.e., the Agency for Protection against Ionizing Radiation and Nuclear Safety of Serbia announced that the population and the environment are not endangered, after measurements in the field by inspections of this agency and authorized laboratories of the Institute of Nuclear Sciences "Vinča". It was the case of military complex in which the radioactive material in containers was transported in poor condition.

With the entry into force of the Law on Radiation and Nuclear Safety and Security² in Serbia in December 2018 Agency for Radiation Protection and Nuclear Safety of Serbia

² "Official Gazette of the Republic of Serbia" no. 95/18.

which was established by the Decision of the Government continues to work as Directorate for Radiation and Nuclear Safety and Security of Serbia with duty to provide conditions for the implementation of measures for radiation and nuclear safety and security. The aim of the new law is the introduction of new standards in the implementation of measures for protection against ionizing radiation, nuclear and radiation safety and security, the establishment of strict and complete control over the sources of ionizing radiation and nuclear facilities, radiation and nuclear activities, as well as over the management of radioactive waste.

The new Law on Radiation and Nuclear Safety and Security represents the step in bringing closer our legislation to *Acquis Communautaire* (EU legislation). The legal basis for the adoption of bylaws that will enable full harmonization of our law with European regulations, to which the Republic of Serbia committed by signing the Stabilization and Association Agreement between the European Community and its Member States, shall be determined by its provisions. News that this law brings are the new concept of the law which is based on the improvement in the treatment of existing situations, planned and extraordinary exposure to ionizing radiation, categorizing activities, an integrated approach to regulatory control in the field of radiation and nuclear safety and security, the establishment of a truly independent regulatory body, the determination of the expanded scope of competence of the regulatory body, the integration of inspections, and the legal institute of the suspension of approvals introduced in the Law. It will be applied to all activities that involve peaceful application of nuclear energy and ionizing radiation in the territory or under the jurisdiction or control of Serbia.

Public Prosecutor's Office in Pančevo indicted the owner of the firm "Eco 21" for the criminal act of taking hazardous materials in Serbia and prohibited processing, disposal and storage of hazardous waste. It was reported that in March 2018. at two locations in Pančevo and one in New Kozjak in municipality Ali Bunar the waste for which ecotoxicologists from the Institute for Public Health in Belgrade established that belongs to the category "hazardous"³³ were found. Indictment related to the illegal disposal of waste on two sites in Pančevo. The deponies of hazardous waste were found. During December 2018. and today these garbage dumps are located at the same location. The owner of the firm that in this way disposed hazardous waste is not available to investigative authorities, and for this criminal act is by law predicted the imprisonment from six months to five years.

It is necessary to increase environmental awareness. In 2017. activists of environmental group "Greenpeace" in France, pointed out a better protection of nuclear waste and lobbied to France to build special bunkers above their pools with waste. Government and the President of France committed to expand the use of renewable energy and reduce dependence of obsolete nuclear power plants, which are the source of the most of the electricity in this country.

With hope that the Law will overcome the power, the Sustainable Development Goals are high on our agenda for the future.

There is also hope that the violation of the rights of investors in the solar energy sector and other types of renewable energy (energy from the sun, water, wind, biomass energy,

³³ Contains Vanadium and total hydrocarbons; we speak about waste oils... improperly stored at the mentioned locations, the presence of which may endanger human health.

underground heat energy - geothermal) will stop, because during the past decade many arbitration disputes have been initiated against some European countries.

The Spanish solar project is interesting, which instead of "fine tuning" implemented a total turnaround, so legitimate expectations were disappointed. Apart from Spain, other countries (Czech Republic, Bulgaria, Romania, Italy) have been targeted by investors in the renewable energy sector.

At the time they were introduced, incentives for renewable energy production were in an experimental phase, leading states to learn by trial and error. (See: Directive EU 2001/77/EZ no longer in force, repealed by Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (*OJ L 140, 5.6.2009, p. 16–62*). The share of electricity produced in the Community from renewable energy sources with state aid (preferential price) is relatively low.

5. CONCLUSION

This paper is intended to present orientation toward Sustainable Development Goals and regulatory trends in nuclear sphere in the Republic of Serbia. This project is proposed with aim to promote international cooperation in the field of nuclear regulation and sustainable development

The dynamic development of technology is changing the architecture of cities. Caring for sustainable development is present, and in 2016. the new urban agenda which establishes global standards for the development of cities in the world was adopted. In Serbia, many cities (one of these cities is Pančevo) and municipalities have started to apply innovative instruments for improving the lives of their citizens, and the environment in which they live. The current trends are social polarization of the population on Planet and Sustainable Development Goals.

There is no more important task than guarding the country, and reasonableness and courage are constantly proven. *Bene andire est optimum patrimonium* (A good reputation is the best heritage).

UN estimates are that in 2050, the world's population could reach 9.7 billion. The pressure on resources will be great due to climate change, as well as the risk for the future.

Mauriac Francois wrote that it is worth nothing to a man to conquer the Moon, if he loses the Earth. With hope that the Law will overcome the power, the Sustainable Development Goals are and should stay high on our agenda for the future.

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