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Nuclear Challenges of Neglected Lessons of Chornobyl

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Abstract

The article presents the author's reflections on the consequences and lessons of the Chornobyl nuclear power plant (CNPP) accident 38 years after the catastrophe and two years after the Russian occupation of the CNPP and the exclusion zone. The Chornobyl disaster was a pivotal historical moment that should have taught us to care about the present and future. One of the lessons learned from the Chornobyl accident was the new safety culture focused on nuclear risk prevention. However, it is visible now that Russia's actions towards civic nuclear facilities in Ukraine correspond to the criteria of nuclear terrorism and raise nuclear risks. It can be attributed to the neglect of the lessons of Chornobyl and the disregard for the new safety culture. Such actions violate ethical and legal norms, and call for steadfast and effective response.

The European and global communities in close cooperation with Ukraine urgently need to take action to stop Russian aggression in Ukraine and prevent new nuclear threats for the present and future generations. It is necessary to change the situation when existing moral norms and principles of humanitarian legislation are ignored by the Russian Federation.

Keywords

lessons of Chornobyl; post-Chornobyl safety culture; Russian aggression in Ukraine; nuclear terrorism

Abstrakt

Článek přináší úvahy autorky o důsledcích havárie černobylské jaderné elektrárny, jak je vidíme 38 let po katastrofě a dva roky po ruské okupaci této elektrárny a její uzavřené zóny. Černobylská katastrofa byla klíčovým historickým momentem, který nás měl naučit pečovat o přítomnost a budoucnost. Jedním z ponaučení z černobylské havárie měla být nová bezpečnostní kultura zaměřená na prevenci jaderných rizik. Nyní je však vidět, že kroky Ruska vůči ukrajinským jaderným zařízením, která slouží mírovým účelům, odpovídají kritériím jaderného terorismu a zvyšují jaderná rizika. Lze to přičíst tomu, že zkušenost z Černobylu nebyla řádně využita a na novou bezpečnostní kulturu se tak nebere zřetel. Takové jednání porušuje etické a právní normy a vyžaduje rozhodnou a účinnou reakci.

Evropské a světové společenství v úzké spolupráci s Ukrajinou musí naléhavě přijmout opatření k zastavení ruské agrese na Ukrajině a zabránit tak novým jaderným hrozbám pro současnou i budoucí generace. Je nutné aktivně čelit situaci, kdy jsou stávající morální normy a zásady humanitární legislativy Ruskou federací ignorovány.

Klíčová slova

poučení z Černobylu; kultura bezpečnosti po Černobylu; ruská agrese na Ukrajině; jaderný terorismus

Introduction

As the worst nuclear accident (Plokhy, 2018) and an event global scale, the Chornobyl[1] nuclear power plant (CNPP) catastrophe of 1986 was a serious lesson for humankind concerning the values and valuation of life, reassessment of technological optimism, and limits of technological development. It put on the agenda the questions of rethinking the meanings of risks, safety, and responsibility. After the Chornobyl accident, it became evident that the civic nuclear facilities are the objects of increased danger and risk which cannot be reduced to zero and anyone cannot feel himself or herself wholly secure. The risk that arises from the civic nuclear facility is not "an eschatological ecofatalism" (Beck, 1992: 37) and civic nuclear facilities are components of the risk society as it was defined by Ulrich Beck in the book "Risk Society: Towards a New Modernity". (Ibid.).

The Chornobyl accident changed the attitude toward the "peaceful atom" and nuclear energy. It contributed, on the one hand, to the antinuclear sentiments and, on the other hand, to the formation of the concept of "safety culture" which defines "the safety of a facility is the top priority for all operators". (Guarnieri, 2017: 2). There was also a turn in the public discourse from contrasting the 'peaceful atom' and nuclear weapons to understanding how nuclear weapons and non-military nuclear power are intertwined. Indeed, such a connection is evident, as both spheres are based on common scientific and technological grounds and the non-military nuclear power sector emerged from the atomic military programs in the 1940s–1950s. For instance, as it became known later, the Soviet nuclear programs were aimed not only at demonstrating the prestige of Soviet atomic science and the production of electricity for civilians but also at providing plutonium for military use. During the Soviet time, 17 units were built in the territory of Ukraine and the CNPP (4 units) was one of them. Thus, Ukraine became a territory of potentially high risk for the environment and population, which turned into a reality on 26 April 1986 after the Chornobyl accident and showed the devastating effect of the 'peaceful atom': long-lasting massive contamination of ecosystems; threatening the life and health of many people; undermining the food and water security due to radioactive soil contamination and exclusion of many farmlands; separation of people from their native land; destroying the unique cultural heritage of the region. In this respect, the Chornobyl accident corresponds to the criteria of and is included in the list of specific examples of ecocide resulting from human activity that threatens the integrity of global and local ecosystems and has large-scale and long-term consequences for the biosphere and humans. (Gardashuk, 2023).

For Ukrainians, the years after the Chornobyl accident were the time of overcoming the disaster consequences, research, and thinking about the causes of the accident and strategies for the territory development, as well as the measures to prevent new nuclear threats and to ensure nuclear safety ("Never again!"). As a result of joint efforts and contributions of many national and international actors (e.g. GEF, UNEP), the Chornobyl Radiation and Environmental Biosphere Reserve was designated in 2016 as an area of global importance (Chernobyl Radiation and Ecological Biosphere Reserve), the secondary sarcophagus covered the damaged reactor, and the town of Prypiat has been growing into an established site of commemoration and disaster tourism since 2011.

[1] In adherence to contemporary Ukrainian linguistic norms, this article employs the authentic Ukrainian toponym "Chornobyl" rather than the Russified "Chernobyl" used during the Soviet era, consistent with the broader trend of reclaiming indigenous names for geographic locations, such as "Kyiv" over "Kiev" and "Odesa" over "Odessa".

Despite the time distance from April 1986 and taken efforts, many people in Ukraine are still bearing this trauma and are especially sensitive to the danger of nuclear disaster which has an added 'shock value' for Ukrainians. Events like the Chornobyl accident should never be repeated in the territory of the country and elsewhere. This is why Ukrainian society responded with pain and empathy to the Fukushima Daiichi nuclear accident in March 2011 and shared with Japan the experience of overcoming the consequences of the Chornobyl accident (Ukraine is ready to provide Japan with the necessary assistance to overcome the aftermath of the earthquake, 2011; Ukrainian nuclear expert remembering those affected by Japan's March 11 disaster, 2024).

Neglected lessons of Chornobyl

The full-scale Russian aggression in Ukraine turned the time back. The Russian occupation of the Chornobyl Nuclear Power Plant (CNPP) and the Zone of Exclusion (24 February to 1 April 2022), attacks on other civic nuclear objects (Kharkiv Institute of Physics and Technology, South Ukraine NPP, and Khmelnytskyi NPP), and occupation of the largest in Europe Zaporizhzhia Nuclear Power Plant (ZNPP) in March 2022 mean for Ukrainians "the potential for a repeat of the disaster, which they have spent three decades and considerable resources trying to prevent." (Petryna, 2022).

During the 36 days of the occupation of the CNPP and exclusion zone Russians brutally intervened in the operation of the object. The occupiers not only threatened the lives of many people but also ignored the safety of their soldiers who dug trenches in the polluted 'Red Forest', and poached and ate wild animals in the zone of exclusion. At the same time, the Ukrainian staff being under the pressure of the invaders but guided by a sense of responsibility tried to sustain the work of the facility.

The capture by the Russian troops of the ZNPP seriously threatens the safety and security of the operation of the ZNPP. (Dienelt, 2022; Hibbs, 2023). The situation at the ZNPP is constantly changing for the worse, especially after the undermining of the dam at the Kakhovka Hydropower Plant (KHPP) (6 June 2023) and taking into account the information about the compromising the reactors and cooling ponds. The attacks on nuclear facilities are known from the 1980s (for instance, Iraq's Osirak Research Reactor, Iran's two Bushehr power reactors, Tuwaitha Research Center, etc.). However, these cases took place before the facilities concerned had commenced operation, and, fortunately, none of these attacks resulted in significant radiation releases (Carlson, 2022). The exclusivity of the case of the ZNPP is that it was the biggest operating nuclear power plant in 2022 in Europe, with a total capacity of 5,700 MWe (megawatts electrical). The General Director of the IAEA Rafael Mariano Grossi characterized the situation at the ZNPP and in the city of Energodar as "completely unacceptable". (Director General's Statement, 2022). He states a crucial need "to protect the six-reactor plant and help prevent a nuclear accident that could have severe consequences on people and the environment in Ukraine and elsewhere". (Update 152 – IAEA, 2023). Thus, after the Cold War and the Three Mile Island nuclear power plant accident in the USA (1979), Chornobyl (1986), and Fukushima (2011) nuclear disasters, humanity is once again under the threat of massive radiation danger because of neglecting the lessons of Chornobyl.

Nuclear terrorism or nuclear safety: which will prevail?

The case of the ZNPP and attacks on other civic nuclear objects in Ukraine demonstrate the violence in the basic ethical principles (preservation of life on the Earth, safety of the present and future generations, non-interference in the operation of dangerous objects, etc.) embedded in the international humanitarian law. The existing international legal system regulates the legal use of force in armed conflict (military necessity, distinction, proportionality). It prohibits actions that may result in widespread, long-term, and severe damage to the natural environment and cause transboundary damage to neutral states. (Carlson, 2022). These actions at the civilian nuclear facilities

can be qualified as terrorism which is a special type of war carried out for psychological pressure, blackmail, and instilling fear and chaos.

The phenomenon of terrorism is a matter of discussion for politicians, political and social philosophers, and ethicists. A key question of these discussions is "whether terrorism is always wrong, or whether there can be cases in which it is morally justified?". (Rodin, 2006; Ethics and Terrorism, 2022). However, the case of nuclear terrorism is unequivocally condemned from existential, humanitarian, environmental, moral, and legal positions due to its unpredictable large-scale destructive consequences for the environment and many people.

The international community has made an effort to prevent this kind of crime. The International Convention on the Suppression of Acts of Nuclear Terrorism was adopted and came into force in 2007. Both Ukraine and the Russian Federation are parts of it. Moreover, ironically the draft convention was proposed by the Russian Federation, and then considered by the Legal Committee of the UN General Assembly (UNGA) in December 1996. The Convention criminalizes "planning, threatening, or carrying out acts of nuclear terrorism; it also requires States to criminalize these offences via national legislation and to establish penalties in line with the gravity of such crimes". (International Convention on the Suppression of Acts of Nuclear Terrorism). The Convention also defines the obligation of countries and national governments to take measures that would prevent the ingress of radioactive substances and technologies to third parties, that is non-state actors or terrorist groups. (Ibid). Instead, the activities of the Russian Federation in Ukraine concerning civic nuclear facilities demonstrate that the very state ignores and violates its obligations and acts like a third party.

At the same time, it seems that Russia's actions concerning nuclear facilities in Ukraine continue its general neglect of the nuclear threat, disregard for safety, and failure to adopt the post-Chornobyl safety culture. For instance, Maerli et al. mentioned in their overview of the characteristics of nuclear terrorist weapons that at many Russian nuclear facilities, physical protection and nuclear material accountancy fall below defined Western standards and emphasized the need for more intensive international cooperation to improve the security of nuclear material in Russia. (Maerli et al. 2003, 739). These also can be assessed as unlearned and neglected lessons of Chornobyl taking into account that part of the territory of the Russian Federation was also affected by the accident.

Theoretically, it should be recognized that it is very difficult to predict or build a precise model of the risks and consequences of third-party (that is person or organization less directly involved in a matter than the main people or organizations that are involved) interference in the operation of nuclear facilities. This is why such risks sometimes are defined as virtual ones. (Downes & Hobbs, 2017). Another side of the virtual risk is the potentially low probability of nuclear terrorism due to difficulties in accessing relevant nuclear materials and technologies as well as operating with such technologies without special knowledge, skills, and experience. Some scholars and security experts criticized excessive concern about nuclear terrorism as "an overrated nightmare". However, despite the low probability of nuclear terrorism, the possible (or virtual) "level of physical destruction, fatalities, and injuries is so great in and of itself" that the potential for terrorist use of nuclear devices or unauthorized interference in the operation of nuclear facilities is worth serious consideration: "This is why ignoring the possibility of nuclear terrorism seems to be not only simplified but also a dangerous approach." (Maerli et al., 2003: 728).

Application of the general approaches to the definition and assessment of nuclear security and nuclear safety, on the one hand, and the threat of nuclear terrorism, on the other hand, to the present Ukrainian realities demonstrates the short-sightedness of simplification or underestimation of security vulnerability and nuclear risk reality. The events of the current Russo-Ukrainian War proved the reality of nuclear terrorism: "The lesson from Zaporizhzhya is that the unthinkable – an attack on an operating nuclear power plant – can happen." (Carlson, 2022). The danger of a nuclear accident at the largest in Europe Zaporizhzhia NPP jumped up after the destruction of the Kakhovka dam in combination with the risk of mining. The Russian Federation according to its international obligation should prevent nuclear terrorism, but in Ukraine, Russia acts as a terrorist, or as a state terrorist.

Despite different scenarios of possible disaster and their consequences, the core concern is that the purposeful act of nuclear terrorism or accidental breakdown due to external intervention in the operation of the facility cannot be excluded. According to Nick Ashdown, after "having destroyed entire large cities in Ukraine and elsewhere – Grozny, Aleppo, Mariupol – and having rewarded the unit reportedly responsible for the mass atrocities committed in Bucha, it seems dubious that Putin would have any moral qualms with using nuclear weapons if he felt an urgent need." (Ashdown, 2022). Similarly, it can be presumed that after the undermining of the Kakhovka hydropower plant, Russians have no moral barriers to doing so in the civic nuclear objects.

Thus, the Russian Federation's actions regarding nuclear infrastructure, especially occupation of and behavior at the Zaporizhzhia NPP can be defined as double nuclear terrorism when the nuclear state (that is the state with a nuclear weapon) attacks and interferes in the operation of the civic nuclear facilities and weaponizes the civic nuclear infrastructure with the purpose of blackmail and pressure not only on Ukraine but also on the international community. Russian nuclear status combined with rhetoric of blackmail deterrence is decisive for the West's response like it was during the Gulf War and the Yugoslav (Balkans) Wars when the West intervened in conflicts without the risk of nuclear escalation. (Inheriting the Bomb, 2023).

Nuclear terrorism is speculation on and exploitation of human fears of nuclear disaster, and the Russian Federation abuses these fears neglecting the lessons of Chornobyl. Such horrification and blackmailing according to the opinion of the MEP for the Greens and Vice-Chair of the Delegation to the EU-Ukraine Parliamentary Association Committee Viola von Cramon is very dangerous and opens a "Pandora's box where any nuclear state can extort any concession from the international community with impunity". (Ashdown, 2022).

Conclusion

The Chornobyl accident was one of the biggest nuclear disasters that resulted from the misoperation of the civic nuclear object. It was a turning point for the rethinking of the role of the 'peaceful atom' and the strengthening of nuclear safety at the civic nuclear objects. The efforts taken by Ukrainian society in cooperation with the global community to overcome the negative consequences of the accident are lessons learned from Chornobyl resulted in the development of a post-Chornobyl safety culture aimed at nuclear risk prevention.

In the current full-scale war against Ukraine, Russia sees nuclear blackmail as one of the means of warfare applying both the rhetoric of nuclear weapon application and weaponization of civic nuclear objects. According to the post-Chornobyl safety culture and internationally accepted principles of nuclear safety and security, the activities of the Russian Federation concerning civic nuclear facilities in Ukraine fall under the definition of nuclear terrorism that is a part of the hybrid war not only against Ukraine and threatens Europe and the whole world. These can be assessed as neglect of the Chornobyl lessons and abuse of human fear of new nuclear threats.

The risk of unintended or purposeful damage to civic nuclear facilities with catastrophic and unpredictable environmental and human consequences at the national, European, and global levels calls for the joint efforts of the global community that should result in the end of military actions and the transfer of civic nuclear facilities under Ukrainian control. In addition, there is a need to improve and strengthen international humanitarian law and provide international institutions with effective tools to solve the problems Ukraine faces now and to avoid them recurring elsewhere in the future. This is not an easy task, but it is one whose resolution cannot be a matter of postponement.

References

- Ashdown, N. Should Europe Worry About Nuclear Escalation in Ukraine? 12 July 2022. https://www.greeneuropeanjournal.eu/should-europe-worry-about-nuclear-escalation-in-ukraine/
- Beck, Ulrich. 1992. Risk Society: Towards a New Modernity. SAGE Publications Ltd.
- Carlson, John. Prohibition of military attacks on nuclear facilities. Vienna Center for Nuclear Non-proliferation and Disarmament. 12 September 2022. https://vcdnp.org/wp-content/uploads/2022/09/Attacks-on-nuclear-facilities_Carlson-updated.pdf
- Chernobyl Radiation and Ecological Biosphere Reserve. https://www.uatom.org/en/chernobyl-radiation-and-ecological-biosphere-reserve
- Dienelt, A. How Are Nuclear Power Plants Protected by Law During War? Völkerrechtsblog, 07.03.2022. https://doi.org/10.17176/20220308-000934-0
- Downes, R.J., Hobbs, Ch. 2017. Nuclear Terrorism and Virtual Risk: Implications for prediction and the utility of models. European Journal of International Security. 2 (2): 203 – 222. https://doi.org/10.1017/eis.2017.5
- Ethics and Terrorism. 2022. Ed. By Max Taylor, John Horgan. Oxford.
- Gardashuk, T. 2023. Ökologische Auswirkungen der russischen Aggression in der Ukraine und eine Vision der Wiederherstellung. Ökozid Wie ein Gesetz schwere Umweltschäden bestrafen und Lebensgrundlagen besser schützen kann. (Ed. Pfaff T). Eokom verlag, München: 383-385.
- Guarnieri, F. 2017. The Fukushima Daiichi Nuclear Accident: Entering into Resilience Faced with an Extreme Situation. Resilience: A New Paradigm of Nuclear Safety. Ahn, J., Guarnieri, F., Furuta, K. (eds). Springer, Cham. https://doi.org/10.1007/978-3-319-58768-4_1
- Hibbs, Mark. The narrow field of options for safely managing Ukraine's Zaporizhzhia Nuclear Power Plant. Bulletin of the Atomic Scientists. March 10, 2023. https://thebulletin.org/2023/03/the-narrow-field-of-options-for-safely-managing-ukraines-zaporizhzhia-nuclear-power-plant/#post-heading
- Inheriting the Bomb: The Collapse of the USSR and the Nuclear Disarmament of Ukraine. 14 April 2023. Vienna Center for Nuclear Non-proliferation and Disarmament. https://vcdnp.org/inheriting-the-bomb-event-report/
- International Convention on the Suppression of Acts of Nuclear Terrorism. https://www.nti.org/education-center/treaties-and-regimes/international-convention-suppression-acts-nuclear-terrorism/
- Maerli, M.B., Schaper, A., Barnaby, F. 2003. Characteristics of Nuclear Weapons. American Behavioral Scientist. 46(6): 727-744. https://doi.org/10.1177/0002764202239151
- Petryna, A. 2022. What Russia Is Stirring Up at Chernobyl. The Atlantic. March 2.
- Plokhy, S. 2018. Chernobyl: The History of Nuclear Catastrophe. Basic Books. New York
- Rodin, D. 2006. Terrorism. Routledge Encyclopedia of Philosophy. https://doi.org/10.4324/9780415249126-S110-1
- Ukraine is ready to provide Japan with the necessary assistance to overcome the aftermath of the earthquake. 2011. Ministry of Foreign Affairs of Ukraine.

https://mfa.gov.ua/en/news/1442-ukrajina-gotova-nadati-japoniji-vsyu-neobkhidnu-do-pomogu-dlya-podolannya-naslidkiv-zemletrusu

- Ukrainian nuclear expert remembering those affected by Japan's March 11 disaster. 2024. NHK World–Japan. https://www3.nhk.or.jp/nhkworld/en/news/20240311_07/
- Update 152 – IAEA Director General Statement on Situation in Ukraine. 30 March 2023. IAEA. https://www.iaea.org/newscenter/pressreleases/update-152-iaea-director-general-statement-on-situation-in-ukraine

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