European Research Studies Journal
Volume XXVIII, Issue 4, 2025

pp. 1021-1043

Security of Nuclear Facilities in Armed Conflict – The Chernobyl NPP Drone Attack Case in Light of International Law

Submitted 19/09/25, 1st revision 14/10/25, 2nd revision 26/10/25, accepted 20/11/25

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Abstract:

Purpose: *The article delivers a source-based legal and strategic assessment of the 14 February 2025 drone attack on the Chernobyl NSC, outlining its legal classification, factual reconstruction, comparative context and implications for the future protection of nuclear infrastructure.*
Design/Methodology/Approach: *The study uses primary and secondary sources to conduct a doctrinal legal and comparative analysis of the Chernobyl drone attack, complemented by a security studies perspective that evaluates its motives, consequences and implications for regional and global nuclear security.*
Findings: *The analysis showed that the Chernobyl NSC strike violated international humanitarian law, targeted a non-military facility in a manner aimed at intimidation rather than military gain, caused structural damage without radiological release, and reflected a broader pattern of using nuclear infrastructure for strategic pressure while exposing weaknesses in existing protective mechanisms.*
Originality/Value: *The article provides a source-based, comprehensive assessment of the Chernobyl NSC drone attack as a precedent in targeting nuclear infrastructure during armed conflict. Its value stems from integrating legal analysis, technical reconstruction and comparative context, revealing gaps between existing protective norms and current conflict realities. It also outlines practical implications for regional nuclear security and the need to reinforce international protective mechanisms.*

Keywords: *Armed conflict, nuclear security, state terrorism.*

JEL codes: *Z10, D74, H56.*
Paper type: *Research article.*

Funding: *This work was supported by the Polish Ministry of Science and Higher Education under project No. RID/SP/0042/2024/01, Increasing Competences in identifying threats related to hazardous materials, from program Regional Excellence Initiative, 2024-2027.*

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1. Introduction

On 14 February 2025, nearly 39 years after the Chernobyl disaster, a drone armed with an explosive payload struck the sarcophagus covering damaged block No. 4 (Dolzikova, 2025 p.62). According to Ukrainian authorities, the incident involved a Russian unmanned aerial vehicle (UAV). The UAV detonation caused a fire and significant damage to the New Safe Confinement (NSC).

Although no increase in radiation levels on the NSC was recorded and no casualties were reported, the attack raised serious legal and strategic questions regarding its classification - whether it constituted a permissible act of war, a war crime, or an act of state-sponsored terrorism (Permanent Mission of Ukraine to the IAEA, 2025).

The objective of this article is to provide a legal and strategic analysis of the incident. It begins by outlining the legal status and strategic importance of the targeted facility, followed by a presentation of the facts surrounding the attack based on reports from the International Atomic Energy Agency (IAEA), the Polish Atomic Energy Agency (PAA), and Ukrainian sources.

The analysis seeks to differentiate between a legitimate act of war and an act of state-sponsored terrorism—based on the adversary's intent, motivation, and the consequences of the strike. Within this framework, the positions of Ukrainian authorities, the IAEA, and relevant international organizations are considered.

In conclusion, the attack will be compared with other assaults on nuclear infrastructure—including those targeting the Zaporizhzhia and South Ukraine Nuclear Power Plants (NPP), Iran's Natanz facility, and Iraq's Osirak research reactor — to determine whether the Chernobyl incident reflects a broader pattern of leveraging nuclear threats as a tool of political coercion.

The article concludes with recommendations for strengthening the security architecture of nuclear facilities in the region, particularly in the context of the ongoing war in Ukraine**.**

2. Chernobyl Exclusion Zone and a Cover over the Unit No. 4 – Legal Status and Strategic Significance

The Chernobyl Exclusion Zone is a designated area with a radius of approximately 30 kilometers surrounding the site of the major accident that occurred on 26 April 1986. It is located in northern Ukraine, roughly 130 kilometers from Kyiv and less than 20 kilometers south of the Belarusian border.

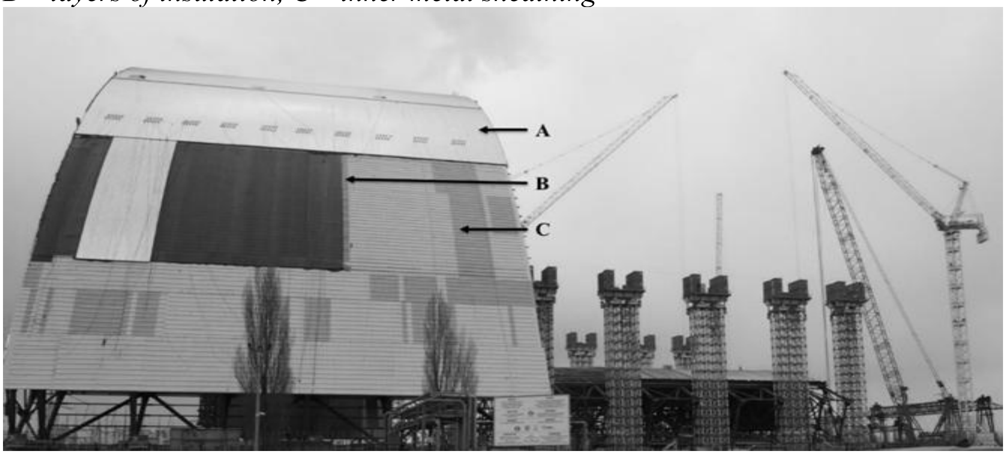
The Exlution Zone was established immediately following the failure of Reactor No. 4 at the Chernobyl NPP in order to isolate the most heavily contaminated areas.

Civilian settlement in the zone is prohibited, nevertheless there is exception to this rule that covers rotational personnel responsible for maintenance and monitoring of the site. In recent years, a part of area of the Exclusion Zone has been gradually reopened to allow for limited scientific research and regulated tourism.

Nonetheless, the area remains under strict oversight by Ukrainian authorities and international regulatory bodies, most notably the International Atomic Energy Agency (IAEA) (World Nuclear Association, 2009, p. 1 ff., Bugai, Kireev et al., 2022, pp. 1–2). Since the 1986 the Chernobyl NPP is a unique site – it has a sophisticated legal and technical structure.

In the immediate aftermath of the accident, a constructed reinforced concrete sarcophagus — known as the Shelter Structure (ukr. Об'єкт "Укриття")—was erected over the destroyed reactor unit to constrain the release of radioactive materials into the environment. This structure screens the environment against the damaged reactor core, which still holds approximately 200 tons of molten nuclear fuel and high-level radioactive waste. The New Safe Confinement under construction has been showed on Figure 1.

Figure 1. *The New Safe Confinement under construction A – outer metal sheathing, B – layers of insulation, C – inner metal sheathing*



Source: *Author's owned photography.*

The sarcophagus was intended as a temporary solution, constructed under of extreme radiation dose rate, In the following decades, the other reactors at Chernobyl (Units 1–3) continued to operate, with the final one being shut down in the New Year eve 2000. Since then, the plant has ceased all energy production and functions solely as a decommissioned nuclear facility undergoing long-term remediation and risk management. The site is continuously monitored by radiation safety and nuclear security personnel, operating under the supervision of Ukraine's State Nuclear Regulatory Inspectorate (SNRIU), State Agency of Ukraine on Exclusion Zone

Management (SAUEZM) and the International Atomic Energy Agency (IAEA).(IAEA, 2025, Bugai, Kireev *et al.,* 2022, pp. 1-2).

Due to the deteriorating condition of the original sarcophagus, the international community supported Ukraine in implementing an unprecedented engineering project—the construction of the New Safe Confinement (NSC). This massive arched steel structure, the largest movable land-based building in the world, was designed to encapsulate the old sarcophagus and the entire remains of Unit No. 4.

Its primary purpose is to provide a safe and secured barrier for the next century, significantly reducing the risk of radioactive release and enabling the eventual dismantling of the original shelter in a controlled conditions (World Nuclear Association, 2025, Phys.org, 2017, Institution of Civil Engineers, 2025). NSC is approximately 162 meters in length, 257 meters in span, and 108 meters in height, with a total weight of around 36,000 tons.

The structure is equipped with a dual-layer shell - an inner and an outer envelope - separated by a 12-meter gap, which enhances its structural resilience and radiological insulation capabilities (European Bank for Reconstruction and Development, 2019). The official commissioning of the NSC took place in 2019, following more than two decades of planning and construction.

The total cost of the project amounted to approximately €1.5–2 billion, funded by a consortium of 45 donor countries under the auspices of the European Bank for Reconstruction and Development (EBRD) (European Bank for Reconstruction and Development, 2019).

The main functions of the NSC is : first, to prevent the release of radioactive materials still present inside the structure into the environment; and second, to shield the damaged Reactor No. 4 from external environment conditions and potential catastrophic events. Within the inner space of the NSC, remotely operated cranes and specialized equipment have been installed.

These systems are intended to facilitate the future dismantling and retrieval of the unstable sarcophagus. Moreover, the equipment will facilitate safe management of the most hazardous radioactive materials, including the molten nuclear fuel (NS Energy, n.d.). Thus, the NSC is a critical structure for long-term strategy for mitigating the consequences of the Chernobyl major accident. Without it, the continuation of safe decommissioning of the sarcophagus would be impossible.

The structure was also designed with resilience to specific natural hazards in mind: it is engineered to withstand extreme temperatures ranging from –43°C to +45°C, a Category 3 tornado, and a moderate-intensity earthquake (VINCI Construction Grands Projets, n.d.). However, the NSC was not designed to withstand direct artillery fire or aerial bombardment, although its overall mechanical resilience is considerable

(Institution of Mechanical Engineers, 2025). From a legal standpoint, the Chernobyl sarcophagus and the NSC constitute civilian facilities with a special status. They are not used for military purposes; on the contrary, their primary function is to protect people and environment from the residual hazards of the nuclear accident.

The international community - including the IAEA and the United Nations - recognizes the Chernobyl Exclusion Zone and its associated infrastructure as warranting exceptional care, due to the critical values at stake, such as environmental integrity and public health (OECD NEA and IAEA, n.d.).

The authors would like to highlight that under Article 56 of the Additional Protocol I to the Geneva Conventions of 12 August 1949, facilities containing “dangerous forces” - including, among others, nuclear power plants - are granted enhanced protection during armed conflicts (International Committee of the Red Cross, 1977) – a detailed analysis of which is provided in the subsequent sections. Since the onset of hostilities in 2022, the International Atomic Energy Agency (IAEA) has maintained continuous expert missions at Chernobyl and other Ukrainian nuclear facilities, aiming to monitor the situation and provide guidance on nuclear safety and security.

During the initial weeks of the invasion (February–March 2022), the Chernobyl site was occupied by Russian military forces, who seized the plant on 24 February 2022 and maintained control until their withdrawal on 31 March 2022 (IAEA, 2025). During this period, several incidents occurred - such as Russian soldiers digging trenches in the highly contaminated "Red Forest" and power outages at the facility - which the IAEA classified as serious violations of nuclear safety standards.

The withdrawal of Russian forces from Chernobyl zone and the return of Ukrainian personnel helped stabilize the situation, yet hostilities continued elsewhere, with Russian troops still positioned within a few hundred kilometers. Under such circumstances, it would seem that neither side would risk compromising the integrity of the Chernobyl facilities, given the potential radiological consequences that could also affect their own territories. However, the events of February 2025 proved otherwise 2022 (IAEA, 2025).

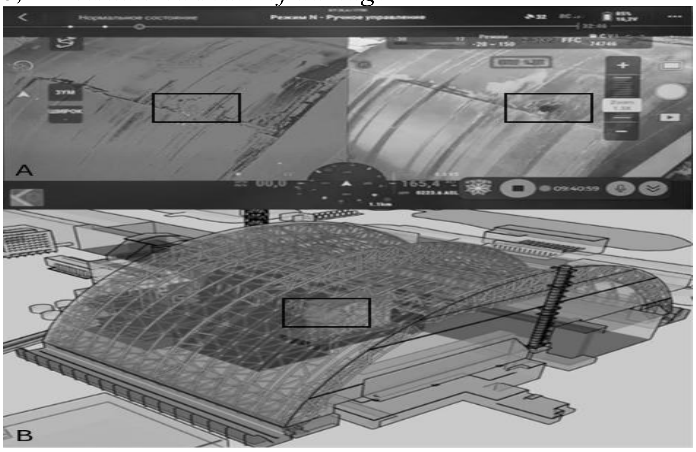
3. Drone Attack on the New Safe Confinement (February 14, 2025): Sequence of Events and Consequences

The drone strike occurred during the night of February 13–14, 2025, at approximately 1:50 a.m. local time. Personnel stationed at Chernobyl NPP reported hearing a loud explosion, followed by the sight of a glow and smoke emanating from the direction of the NSC structure.

Shortly thereafter, Ukrainian authorities confirmed that an unidentified combat drone had struck the NSC, igniting a fire on the roof of the structure. Within minutes, emergency units from Ukraine’s State Emergency Service - including the nuclear plant's internal fire brigade and nearby fire response teams - were dispatched to the site. Despite the prompt firefighting response, the blaze was not immediately extinguished.

Flames continued to consume partitions of the roof's insulation materials for several hours, with residual smoldering observed until dawn. By the morning of February 14, Ukrainian authorities announced that the situation was under control. The fire was officially declared fully extinguished later that afternoon (World Nuclear News, 2025). The scale of damage has been shown on the Figure 2.

Figure 2. *Damaged the New Safe Confinement (NSC): A – camera view on the damaged NSC, B - visualized scale of damage*



Source: *State Emergency Service of Ukraine – SESU CBRN)*

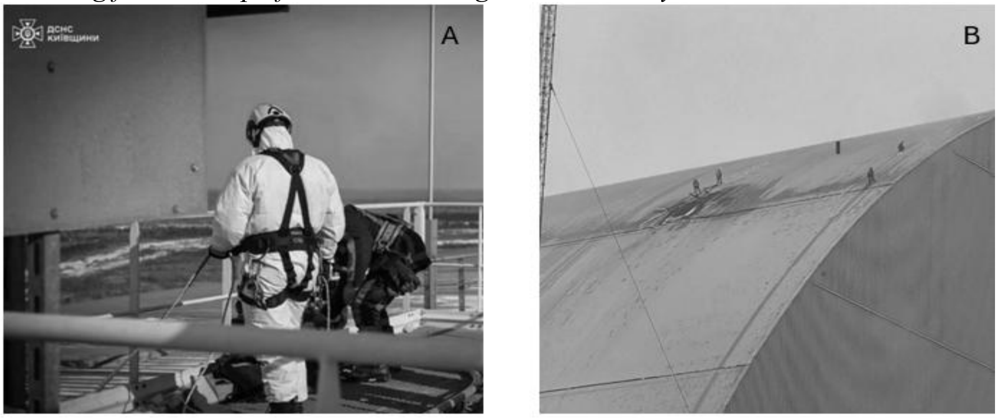
Initial inspections indicated that the attack had caused significant damage to the external shell of the reactor's protective enclosure. Ukrainian President Volodymyr Zelensky, in his public statement regarding the incident, described the destruction as "substantial" and released photographs through the media showing visible damage in the roof covering of the NSC (Zelenskyy, 2025).

Experts from the State Agency of Ukraine on Exclusion Zone Management, together with operators of the Chernobyl NPP, conducted more detailed assessments in the days following the incident.

According to their reports, the drone penetrated the outer steel cladding and detonated, creating a breach approximately 15 square meters in size in the roof of the NSC structure (World Nuclear News, 2025). Other sources report a hole with a diameter of approximately 6 meters; the discrepancy likely stems from whether the measurement referred to the total surface area of the damaged panels or the actual breach itself (BASE, 2025). The force of the explosion also damaged adjacent sections of the cladding—altogether, approximately 200 square meters of the roof sustained various types of damage, including bent metal sheets, torn fasteners, and compromised joints.

Notably, both layers of the protective shell were breached: not only the outer cladding but also the inner layer, meaning the blast penetrated the full cross-section of the NSC arch and reached the space beneath the roof. Fortunately, the main load-bearing elements of the structure (steel trusses) did not suffer significant deformation. However, the internal overhead crane system installed beneath the NSC vault was damaged, complicating further decommissioning operations planned inside the structure (World Nuclear News, 2025). The process assessment of damages performed by SESU has been shown on the Figure 3.

Figure 3. *Carrying out emergency and rescue operations to eliminate the consequences of a UAV strike on the NSC in the Kyiv region, A – preparation for abseiling from the top of NSC, B – damage assessment by the SESU*



Source: *State Emergency Service of Ukraine – SESU CBRN),*

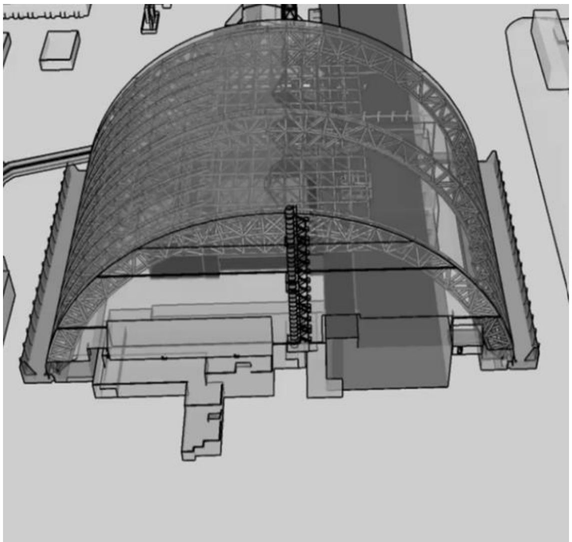
The detonation of the drone ignited the roof's insulating materials. Although the main fire was extinguished promptly, smoldering hotspots persisted for several days. Firefighters, including specialized alpine-rescue teams, continued to monitor and suppress residual smoke and reignitions within the insulation layers for nearly three weeks following the incident (The Guardian, 2025).

It was not until March 7, 2025, that Ukrainian emergency services officially declared the complete extinguishment of all fire sources. In parallel, continuous radiological monitoring was conducted within the facility and its surrounding area. Both the IAEA experts stationed on-site and Ukrainian dosimetry equipment reported no increase in radiation levels as a result of the attack.

This indicates that the structure of the original sarcophagus enclosed within the NSC, as well as the radioactive materials it contains, remained intact and uncompromised (IAEA, 2025). From the perspective of international security, a key issue was the assessment of whether the incident had caused radioactive contamination potentially extending beyond Ukraine's borders. Just a few hours after the attack, the Polish National Atomic Energy Agency (pl. Państwowa Agencja Atomistyki) issued a reassuring statement: "The strike of a Russian drone on the NSC of the Chernobyl

NPP does not pose a threat to safety in Poland. The radiological situation in the country remains normal," the statement read, adding that monitoring stations in Poland had detected no deviations from background radiation levels. Ukrainian authorities issued similar reassurances, confirming there was no threat to nearby areas, including Kyiv. It can therefore be concluded that, by fortunate coincidence, the attack did not result in direct casualties or radioactive contamination, being limited to material damage only (IAEA, 2025, Polish National Atomic Agency, 2025).

Figure 4. *Radiation reconnaissance by the Relative Strength Index (RSI) system during movement and monitoring along the perimeter of emergency and rescue operations, with real-time cartographic projection onto the AIVID application platform to the Radiation Accident Forecasting Center of the Ukrainian Hydrometeorological Center*



Source: *SESU CBRN.*

The Ukrainian side unequivocally accused the Russian Federation of carrying out the attack in question. The allegations were supported by the broader context of ongoing military operations, as the incident occurred during a period of intensified Russian drone activity in northern Ukraine.

Furthermore, the Security Service of Ukraine (SBU) published photographs of drone fragments recovered at the site, identifying the device as a Geran-2 - an Iranian-manufactured Shahed-136 loitering munition used by Russia. Since 2022, these kamikaze drones have been repeatedly employed by Russian forces to strike ground targets in Ukraine, primarily energy infrastructure.

The Shahed-136 carries a warhead weighing approximately 30 - 40 kg, containing high explosives and fragmentation elements. While the explosion of such a payload can inflict localized damage, it is not comparable to the destructive potential of ballistic or air-launched missiles. As analyst Marcel Plichta noted, a drone strike of this nature is “more likely to generate psychological and media impact than to cause extensive physical destruction” (Hunder and Malenko, 2025).

According to reports, the UAV was flying at a very low altitude - approximately 85 meters above ground level - likely to evade air defence radar systems. These flight parameters suggest that the drone was launched relatively close to its target, probably from territory controlled by Russia or from Belarus. On the night of the attack, air raid alerts were issued across northern Ukraine, and several other drones were observed operating in the region, although none directly targeted the Chernobyl site (The Japan Times, 2025).

The Russian side denied any involvement of the Armed Forces of the Russian Federation in the strike on Chernobyl. On 15 February, Kremlin spokesman Dmitry Peskov stated that Moscow “would not do such a thing” and suggested that the incident was a provocation staged by Kyiv, aimed at discrediting Russia in the eyes of the international community (Teslova, 2025).

Similarly, Russian Foreign Ministry spokeswoman Maria Zakharova claimed that the ”Kyiv regime“ had staged the incident itself in order to create a sensation during the ongoing Munich Security Conference and to pressure Western countries into increasing their support.

These assertions, however, were not substantiated by any evidence; on the contrary, analysis of the drone debris and flight trajectory strongly pointed to Russian involvement. The Office of the Prosecutor General of Ukraine launched a formal investigation into the incident, gathering evidence to support the classification of the attack as a war crime committed by the Russian Federation (Greenpeace Ukraine, 2025).

The attack on Chernobyl provoked an immediate global outcry. President Zelensky described it as proof that ”Putin is certainly not preparing for peace” and emphasized that Russia remains the only country in the world willing to target such highly dangerous facilities, disregarding the consequences. ”This is a terrorist threat to the entire world”, Zelensky wrote on social media (Sauer, 2025).

The attack occurred on the eve of the 2025 Munich Security Conference, where the dominant topic was the war in Ukraine and the prospects for peace negotiations. The Ukrainian delegation shared detailed information about the incident with partners from the United States and Europe.

In Munich, President Zelensky met with, among others, the Vice President of the United States, emphasizing the urgent need for a firm international response to what he called Russia’s nuclear blackmail tactics (The Guardian, 2025). Indeed, United Nations officials openly condemned the incident.

On 14 February, speaking before the UN Security Council, UN Under-Secretary-General Rosemary DiCarlo described Russia's actions as "extremely irresponsible" and emphasized that they were in direct violation of Article 56 of Additional Protocol I to the Geneva Conventions (UN DPPA, 2025).

IAEA Director General Rafael Mariano Grossi also expressed deep concern, stating: "This was a very serious incident - a drone damaged a major protective structure at a key nuclear facility. As I have repeatedly stressed throughout this devastating war, attacking a nuclear facility is an absolute taboo - it should never happen.". Grossi once again urged all parties to exercise maximum military restraint around nuclear infrastructure: "The IAEA remains on the highest level of alert, ready to do everything possible to prevent a nuclear accident" (IAEA, 2025).

It is worth noting that the Chernobyl incident coincided with reports of heightened military activity in the vicinity of the Zaporizhzhia Nuclear Power Plant in southern Ukraine. To many observers, this raised concerns about a broader strategic pattern of leveraging nuclear threats as a component of warfare. Analysts suggested that Russia may have sought, through this display of force, to regain the informational initiative and overshadow narratives of its battlefield setbacks with a dramatic and fear-inducing event.

As previously noted by analyst Marcel Plichta, "Russia often uses such attacks to regain control over the narrative". While the drone strike on Chernobyl had no direct impact on the front-line situation, it served as a powerful psychological signal - demonstrating that even sites with catastrophic significance are not immune from becoming targets of military operations.

This, in turn, provoked serious questions about how far the Kremlin is willing to go in escalating nuclear risk (IAEA, 2025). According to Greenpeace, "Russia's impunity for previous nuclear war crimes—including the 2022 occupation of Chernobyl and attacks on energy infrastructure—has only emboldened the Kremlin to strike the most hazardous site in the aftermath of a nuclear disaster".

The organization called on the international community, particularly the European Union, to impose additional sanctions on Russia's nuclear sector, including the state corporation Rosatom, and to recognize the attack as a crime that must be prosecuted by the appropriate judicial authorities (Greenpeace Ukraine, 2025).

4. Legal Qualification of the Incident under International Law. Principles of Ius in Bello – Protection of Nuclear Facilities and War Crimes

At the time of the attack on Chernobyl NPP, an international armed conflict was ongoing between Russia and Ukraine, which meant that the full scope of international humanitarian law (IHL) applied - in particular, the 1949 Geneva Conventions and their

1977 Additional Protocols. Of primary relevance is Additional Protocol I (relating to international armed conflicts), specifically Article 56, which provides for the special protection of installations containing dangerous forces.

This provision stipulates, inter alia, that "works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population."

With regard to nuclear power plants, the article further specifies that "the special protection […] ceases only if the plant in question provides electric power in regular, significant and direct support of military operations, and if such attack is the only feasible way to terminate such support" (International Committee of the Red Cross, 1977).

In the context of Chernobyl, the above-mentioned legal provisions must be interpreted as follows: although Reactor No. 4 at the Chernobyl NPP is no longer an operational power-generating facility (having ceased electricity production in 1986), it nevertheless clearly qualifies for protection under the intent of the provision—namely, to prevent severe civilian harm resulting from the release of dangerous forces.

From this perspective, the facility remains a high-risk nuclear installation which targeting could trigger catastrophic radiological consequences, thereby falling squarely within the scope of Article 56 of Additional Protocol I (IAEA, 2006, pp. 17–20). Indeed, the Chernobyl facility currently contains more hazardous material than many operational reactors, albeit in the form of radioactive waste and remnants from the 1986 disaster.

An attack on the Chernobyl NSC could have potentially triggered the large-scale release of radioactive dust, especially if the explosion had breached the internal structure of the 1986 Shelter Struction or ignited a fire within the reactor chamber. This clearly satisfies the criterion of "release of dangerous forces and ensuing severe civilian losses".

Moreover, the Chernobyl site was not supporting any military operations: it was not supplying energy to armed forces, nor was it serving as a military base.

The only individuals present were a limited number of IAEA technical personnel and Ukrainian specialists. Therefore, the exception outlined in Article 56(2)(b) of Additional Protocol I does not apply. In conclusion, under Article 56 of Additional Protocol I, the Russian drone strike on the Chernobyl facility constitutes a violation of the prohibition against attacks on nuclear installations whose compromise could result in extensive harm to the civilian population (McLaughlin, 2001, pp. 931-956).

A violation of such a fundamental norm of International Humanitarian Law (IHL) simultaneously constitutes a war crime. Article 85(3)(c) of Additional Protocol I classifies as a grave breach any attack on installations containing dangerous forces, carried out with the knowledge that it will cause excessive losses among the civilian population (International Committee of the Red Cross, 1977).

As early as 4 March 2022, when Russian forces shelled the Zaporizhzhia Nuclear Power Plant, the U.S. Embassy in Kyiv warned: "An attack on a nuclear power plant is a war crime." The same legal qualification applies to the Chernobyl incident. In order to establish individual criminal responsibility, it would be necessary to demonstrate that the perpetrator acted intentionally and with awareness of the potential to cause mass casualties or serious injury to civilians.

Given the well-known status of Chernobyl as the site of a nuclear disaster, it is difficult to conceive that the Russian officers who authorized the attack were unaware of the likely consequences (U.S. Embassy in Ukraine, 2022).

The argument that the intended target may have been misidentified is difficult to sustain, as the Chernobyl sarcophagus constitutes a unique and widely recognizable structure, well known even to those without specialized military knowledge.

Moreover, contrary to any claims suggesting that the strike aimed at a military storage facility - an assertion echoed by Russian propaganda insinuating that Ukraine orchestrated the explosion to blame Russia - international inspections conducted by the IAEA have confirmed the facility's exclusively civilian character (IAEA, 2025).

Importantly, although the IAEA does not formally attribute blame to any party to the conflict, its report noted that there were no military targets present at the site, and that the attack represented yet another instance of heightened nuclear safety risks during armed conflict.

Even disregarding the specific protective regime under Article 56 of Additional Protocol I, the drone strike on Chernobyl would constitute a breach of the fundamental principles of International Humanitarian Law (IHL): the principle of distinction — which requires that attacks be directed exclusively against military sites and the principle of proportionality, which prohibits attacks expected to cause incidental civilian harm that would be excessive in relation to the concrete and direct military advantage anticipated (IAEA, 2025).

In this case, the target was a civilian facility with zero military value, while the risk of triggering a humanitarian catastrophe was immense. Such an act qualifies as a deliberate attack on a civilian site, which in itself constitutes a war crime under the Rome Statute of the International Criminal Court (Article 8(2)(b)(iv) - intentionally launching an attack in the knowledge that it will cause damage to civilian objects without military necessity).

Moreover, had the attack resulted in widespread radioactive contamination, it could also have violated international norms on environmental protection during armed conflict. Specifically, Article 35(3) of Additional Protocol I prohibits the use of means or methods of warfare "which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment" (International Criminal Court, 1998, art. 8(2)(b)(iv)).

The mere threat of such consequences is often regarded as profoundly immoral. It is worth emphasizing that for many years, the international community has undertaken legal efforts aimed at excluding nuclear installations from the permissible scope of military operations (IAEA, 1990). A notable example is the international reaction to the Israeli airstrike on the Osirak reactor in 1981, as well as the targeting of nuclear facilities during the Iran–Iraq war in the 1980s.

Both the directly involved states and the broader international community unequivocally condemned such actions. In United Nations Security Council Resolution 487 (1981), the Security Council declared the Israeli strike a violation of the United Nations Charter and the principles of peaceful international coexistence (United Nations Security Council, 1981). In response to these events, the General Conference of the International Atomic Energy Agency (IAEA) adopted a series of resolutions in the following years, urging all states to refrain from attacks or threats of attacks against nuclear power plants - whether operational or under construction (IAEA, 2009).

Additionally, certain regions have implemented their own protective mechanisms. For example, in 1988, India and Pakistan signed a bilateral agreement - the India - Pakistan Agreement on the Prohibition of Attack Against Nuclear Installations and Facilities - committing to refrain from attacking each other's nuclear facilities in the event of armed conflict. These legal and diplomatic instruments collectively affirm the existence of a strong customary norm in international law: that any attack on a nuclear installation is considered unacceptable and deserving of condemnation due to the grave and uncontrollable humanitarian risks it entails (Government of India and Government of Pakistan, 1988).

In light of the issues discussed above, it appears evident that the Chernobyl incident constitutes an unlawful act under the law of armed conflict. It potentially gives rise to both state responsibility - on the part of the Russian Federation - for a breach of international law, and individual criminal liability for those involved in planning or executing the attack.

The investigation launched by Ukrainian authorities marks a necessary initial step; however, any future prosecution of perpetrators would depend either on their apprehension or the establishment of an international tribunal competent to adjudicate such crimes.

5. Act of War or Act of Terrorism? – Motives and Character of the Attack

The concept of state terrorism has not been clearly defined in treaty law; however, in professional literature and political practice, it refers to situations in which a state deliberately employs violence against civilians or civilian infrastructure with the intent to intimidate the population and achieve political goals.

Hallmarks of such conduct include the intention to instill fear, the targeting of non-military assets, demonstrative brutality, and a psychological impact that extends beyond the immediate victims. In contrast, acts of warfare are characterized by the use of force against enemy forces and military sites in pursuit of appropriate military advantage, and are governed by the norms of international humanitarian law (NYU Law, n.d.).

Violence against civilians during armed conflict constitutes a war crime and is not a lawful means of warfare (International Committee of the Red Cross, n.d.). The attack on Chernobyl bears many hallmarks of state terrorism. From a military perspective, it yielded no operational advantage for Russia - the facility was non-operational, did not generate electricity, and provided no support to the Ukrainian armed forces (The Sun, 2025).

The objective, therefore, appears to have been primarily psychological: to instill fear of a nuclear catastrophe, exert pressure on the Ukrainian authorities, and signal a willingness to escalate conflict. The timing of the attack - immediately preceding the Munich Security Conference - suggests an attempt to bolster Russia's bargaining position through an act of violence perceived as a threat of destabilization.

This aligns with the definition of terrorism adopted by the European Union: acts intended to intimidate the population or coerce governments into making specific political decisions (European Parliament, 2022a). The selection of the target - an inactive but symbolically significant facility with the potential for catastrophic consequences - greatly amplified the psychological impact of the attack.

While the site had minimal strategic value, it had the capacity to incite mass panic and widespread fear of radioactive contamination. The potential victims were exclusively civilians, including plant personnel and the populations of Ukraine and neighboring countries. The nature of the target and the civilian status of the potential victims constitute a clear violation of the principles of distinction and proportionality, which are fundamental pillars of the law of armed conflict (OECD Nuclear Energy Agency, 2022, pp. 68-71).

Russia had previously employed methods characterized as terrorist in nature, including the shelling of residential neighborhoods, the siege of cities, and deliberate attacks on hospitals and critical civilian infrastructure (European Parliament, 2022b). Article 51 of Additional Protocol I prohibits acts or threats of violence the primary purpose of which is to spread terror among the civilian population. However, it is important to emphasize that counterterrorism law does not always apply to the conduct of hostilities by state actors during armed conflict.

Many legal instruments expressly exclude military actions carried out by armed forces during wartime from the scope of terrorism definitions. The International Committee of the Red Cross (ICRC) maintains that acts committed during an armed conflict must be assessed under the framework of international humanitarian law (IHL), not under peacetime criminal law.

Even when acts committed during war resemble terrorism in nature or impact, they should be classified and prosecuted as violations of the law of armed conflict, such as war crimes. This approach ensures the internal coherence of the legal regime governing armed hostilities and preserves the distinct applicability of IHL in wartime contexts (International Committee of the Red Cross, 2019).

In light of the foregoing considerations, the Russian attack on Chernobyl NPP should be classified as a war crime, specifically due to the targeting of a protected installation and the deliberate intimidation of the civilian population. Although the term state terrorism is primarily political and lacks a precise legal definition, it aptly characterizes the nature of the methods employed.

In this instance, Russia utilized the threat of a nuclear major accident as a means of coercion, a tactic that has been widely condemned by the international community and clearly reflects the gravity and unlawfulness of the act (Council on Foreign Relations, n.d.).

6. Attacks on Nuclear Infrastructure in Armed Conflicts – A Comparative Context

The war in Ukraine, initiated in 2022, marks the first full-scale armed conflict to take place on the territory of a state possessing an extensive nuclear infrastructure. Prior to the invasion, Ukraine operated fifteen active nuclear reactors across four power plants. In the early days of the aggression, Russian forces seized control of two key facilities: the decommissioned Chernobyl complex and the Zaporizhzhia NPP - the largest NPP in Europe. The Zaporizhzhia plant houses six WWER-type reactors (acr. of Water-Water Energetic Reactors, ru: Водо-водяной энергетический реактор), which are pressurized water reactors cooled and moderated with light water.

These reactors accounted for approximately one-fifth of Ukraine's total electricity production (International Atomic Energy Agency, n.d.). The occupation of the Zaporizhzhia NPP since March 2022 has created a state of ongoing threat. Explosions within the facility's perimeter have damaged transmission lines and auxiliary buildings, forcing the reactors to shut down and transition into emergency mode (IAEA, 2022).

Despite numerous calls by the IAEA to establish a demilitarized zone, Russian forces continued to use the Zaporizhzhia NPP as a military staging area. Exchanges of fire around the complex occurred regularly. One of the most critical threats arose when the cooling systems operated solely on external power, raising the risk of core meltdowns.

IAEA Director General Rafael Grossi described the situation as unprecedented in the history of civilian nuclear energy (Reuters, 2025). On 19 September 2022, a missile strike occurred near the South Ukraine NPP. The projectile impacted approximately 300 meters from the reactors, causing significant damage to auxiliary infrastructure and a nearby hydroelectric facility.

However, the nuclear reactors themselves remained unharmed (Deutsche Welle, 2022). The Ukrainian government described the incident as an example of nuclear terrorism, highlighting the deliberate targeting of the strike location. The destruction of the Kakhovka Dam in June 2023 - although not directly impacting a nuclear facility - had severe repercussions for the cooling system of the Zaporizhzhia NPP.

The demolition of the infrastructure led to emergency situation due to catastrophic flooding of territories in the event of destruction of the Dnipro cascade of hydroelectric power plants. The international community, including NATO, regarded the action as a serious violation of international humanitarian law. A comparative analysis of these cases reveals a pattern consistent with earlier practices (North Atlantic Treaty Organization, 2023).

In 1981, the Israeli Air Force carried out a preemptive strike on the Osirak nuclear reactor in Iraq. The stated objective was to prevent Iraq from developing a potential nuclear weapons capability. The United Nations Security Council condemned the attack in Resolution No. 487, classifying it as a violation of international law and an infringement upon Iraq's sovereignty (United Nations Security Council, 1981).

During the Iran - Iraq War, both sides engaged in reciprocal attacks targeting nuclear infrastructure, including the bombing of the Tuwaitha nuclear facility near Baghdad. In response to these acts, the General Conference of the (IAEA) adopted a series of resolutions strongly condemning any assaults on nuclear installations intended for peaceful purposes.

These resolutions underscored the principle that such facilities, even in times of armed conflict, should be protected under international law due to the catastrophic risks their destruction could entail (IAEA, 1990). Acts of sabotage - such as those directed against Iranian nuclear installations between 2009 and 2021 - are also relevant to this analysis.

The Stuxnet cyberattack, attributed to Israel and the United States, significantly disrupted operations at the Natanz and Fordow facilities. Iranian authorities denounced these actions as acts of nuclear terrorism; however, the absence of a declared armed conflict complicated their unambiguous legal classification under international law. A review of the aforementioned cases yields four principal conclusions:

First, attacks on nuclear infrastructure are consistently met with unequivocal international condemnation, regardless of the perpetrating party (Reuters, 2021).

Second, Russia's actions are marked by an unprecedented level of intensity and frequency.

Third, despite the existence of legal norms, there are no effective mechanisms to prevent such attacks, as evidenced by the international community's limited capacity to deter or respond to Russia's conduct.

Fourth, the classification of these acts remains problematic: they may simultaneously constitute war crimes and forms of state terrorism, depending on the prevailing political narrative and the legal framework applied (Associated Press, 2025).

7. Conclusions and Implications for Nuclear Infrastructure Security in Central and Eastern Europe

The use of an UAV carrying an explosive payload to strike the Chernobyl NSC on 14 February 2025 constitutes an alarming precedent, exposing new threats to nuclear infrastructure security under conditions of armed conflict. This incident demonstrated that even a strictly civilian facility of paramount protective significance – such as the NSC– can become a target, despite clear prohibitions under international law.

According to international humanitarian law (IHL), the attack should be classified as unlawful (in violation of, inter alia, Article 56 of Additional Protocol I to the Geneva Conventions), fulfilling the criteria of a war crime. However, the circumstances and target of the strike - an assault on a non-military facility with the potential to provoke a radiological disaster, have also led to its interpretation through the lens of state terrorism.

From a legal perspective, this classification does not entail separate consequences (as state actions during war are assessed under the ius in bello framework rather than anti-terrorism law). Nevertheless, the psychological impact – inciting fear of nuclear catastrophe to exert political pressure – corresponds to the functional definition of terrorism. The Chernobyl incident, therefore, exemplifies a dangerous fusion of military tactics with the coercive methods characteristic of nuclear terrorism.

From the perspective of the global nuclear security regime, the implications of this attack are profound. First, the breach of integrity at a protected nuclear site reveals that existing legal guarantees and protective mechanisms are insufficient. Despite the presence of norms prohibiting attacks on nuclear installations, there are no effective enforcement instruments - the international community proved powerless in the face of their deliberate violation. The war in Ukraine has exposed critical weaknesses in the current framework: attempts to establish demilitarized zones around nuclear power plants (e.g., at Zaporizhzhia) have failed, and international organizations such as the United Nations and the IAEA lack the operational tools to prevent such attacks. As a result, fundamental nuclear safety standards – developed over decades for the common good of humanity – have been severely undermined.

Second, the Chernobyl incident sets a dangerous strategic precedent. It demonstrates that nuclear power plants and facilities may be politicized and weaponized as tools of nuclear blackmail. A ruthless aggressor can deliberately threaten the release of hazardous substances to coerce concessions from the adversary or dissuade international actors from intervening.

Crucially, the effectiveness of such a tactic does not hinge on actual contamination but on the induced fear itself – the mere threat of disaster can paralyze decision-making as effectively as a real nuclear leak. Analytical assessments suggest that Russia's strategy regarding seized nuclear sites (Chernobyl, Zaporizhzhia) has relied on exploiting nuclear rhetoric for intimidation and disinformation purposes – including false accusations against Ukraine for shelling its own facilities or threats of detonation.

These actions erode public trust in nuclear safety institutions and amplify global uncertainty. The IAEA stresses that any armed conflict near nuclear infrastructure entails a permanent risk to nuclear safety. The Chernobyl case has underscored this reality.

Third, the strike on the NSC has had practical consequences for Ukraine and the international community. Although no contamination occurred, the damage to the NSC structure proved extensive and costly – repairs to many of perforations in the shielding, replacement of damaged panels and lifting equipment will require substantial financial resources and time.

Paradoxically, the material burden falls indirectly on the countries that financed the NSC construction; as early as March 2025, the European Bank for Reconstruction and Development allocated additional funding for damage assessment and emergency reinforcement work (bne IntelliNews, 2025).

This means that the attacker, without bearing direct costs, has shifted the financial burden onto the international community. Such a modus operandi raises serious questions regarding mechanisms for accountability and reparations for damage to critical infrastructure.

Under the current legal framework, the injured state (Ukraine) may seek responsibility from the aggressor before international tribunals or claim compensation; however, in practice, enforcing such claims amid ongoing armed conflict is highly unlikely.

The absence of swift legal and financial consequences undermines the deterrent effect of the law – as commentators note, perpetrators will continue to disregard International Humanitarian Law norms as long as they face no real sanctions.

In view of these challenges, comprehensive remedial measures are necessary, both normative and practical. The international community should unequivocally reaffirm the prohibition of attacks on nuclear facilities and consider strengthening existing regulations. Although a complete ban on the involvement of nuclear infrastructure in armed conflict remains an ideal difficult to achieve (due to lack of global consensus), positive regional examples are instructive.

The historic 1988 India-Pakistan agreement and the provisions of the Pelindaba Treaty demonstrate that states can voluntarily commit to refraining from attacking each other's nuclear installations (Government of India and Government of Pakistan, 1988). In the context of Ukraine, this underscores the urgent need to develop—at least partially—an agreement on the non-attack of nuclear sites, ideally under the auspices of the United Nations or the International Atomic Energy Agency (IAEA).

Additionally, protective and response capabilities around existing nuclear facilities must be enhanced. This encompasses both technical measures (e.g., air defence systems, reinforcement of protective structures, backup power and cooling systems) and organizational measures (continuous presence of international inspectors, improved alarm communication systems). The IAEA already maintains missions at Ukrainian nuclear sites, but their mandate could be expanded to include active advisory roles on military security arrangements.

The justice system - both domestic and international - should intensify efforts to hold perpetrators of attacks on nuclear infrastructure accountable. Ongoing investigations (such as those by the Ukrainian Prosecutor's Office) mark the initial phase of a process that could ultimately culminate before the International Criminal Court or a special tribunal on crimes of aggression. A clear signal that such acts will not go unpunished could serve as a deterrent in the future. Coordinated international pressure measures may limit the aggressor's ability to use nuclear energy as a political instrument.

In a broader perspective, the attack on Chernobyl NPP constitutes a stark warning to the world. It demonstrates that infrastructure designed to protect against the consequences of a nuclear accident can itself become a source of new threats if not effectively shielded from acts of war. The incident sketches a grim vision of future conflicts, in which nuclear power plants or radioactive waste repositories become hostages to military actions. To prevent such scenarios, states must strengthen cooperation within existing international frameworks.

Practically, this means supporting IAEA initiatives - such as the "seven pillars of nuclear security" proposed by the Agency - and actively engaging in the development of operational standards for occupation or shelling of nuclear sites (IAEA, 2022).

Equally important is the provision of immediate assistance to states located within the risk zone, including the transfer of protective technologies and joint crisis response exercises.

As a Greenpeace expert stated, the attack on the Chernobyl NSC should serve as a "final wake-up call" prompting the international community to urgently strengthen the protection of critical infrastructure, especially nuclear power plants (Greenpeace Ukraine, 2025).

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